MINISTRY OF EDUCATION
BRIEFING NOTE

DATE: November 12, 2015
CLIFF: 184874

PREPARED FOR: Dave Byng, Deputy Minister, for **Decision** at the request of the **Learning Division** for a **BC Youth Coding Event** and **Hour of Code** letter of endorsement to superintendents.

SUBJECT: BC Youth Coding Event – Request for Endorsement Letter

BACKGROUND:
The BC Youth Coding Event is a mass youth coding event hosted in celebration of the global computer science and digital literacy awareness campaign called the "Hour of Code". During Computer Science Week from December 7 to 13, four major cities in BC (Victoria, Vancouver, Kelowna and Prince George) will host an event where up to 100 kids from age 8 to 18 per community will get together for half a day to learn how to code for *free.* The initiative is supported by the Ministry of Education, the BC Teachers' Federation's CUEBC (Computer Using Educators of BC) and host partners in each region.

DISCUSSION:
The BC Youth Coding Event is a Technology Industry initiative undertaken in partnership with numerous stakeholders, including the Ministry of Education.
The objectives of the BC Youth Coding Event are to:

- Provide youth in BC with exposure to coding education for free
- Raise the awareness of the value of coding and computer science to the general public
- Inspire youth, particularly girls, to consider a career in technology in order to promote gender equality in computer science
- Engage in a dialogue with the key stakeholders who are part of a student's upbringing and education, on the importance of digital literacy

Participating Cities, Hosts and Event Dates

- December 5 - Vancouver, hosted by Lighthouse Labs
- December 12 - Prince George, hosted by Innovation Central Society
- December 12 - Victoria, hosted by Metalab
- January 2016 - Kelowna, hosted by UBC Okanagan

What will happen during the events?
The events will be half day affairs with up to 100 students and 20 or more industry developers as mentors. A lead instructor will provide a short lesson about coding. The students will then break off to work on a hands-on project with curriculum donated by Learning Partner, Lighthouse Labs. Mentors will be available to help students with their project and engage in conversations about careers in technology. Within a couple of hours, students will go home with a project that they can show to their parents and teachers.

In addition to the special **BC Youth Coding Event** in four BC cities, all districts in the province can participate in the general **Hour of Code** celebration. Last year, 114 BC schools participated. Other jurisdictions, such as New Brunswick and Nova Scotia, have found that a letter of endorsement from the Deputy Minister or Minister to district superintendents can have a very positive effect in increasing participation rates. The organizing partners are requesting a similar letter in British Columbia [See attached draft.] General information about the BC Youth Coding Events and the Hour of Code will be sent to Superintendents in weekly newsletter.

RECOMMENDATIONS:

- Send a letter of endorsement from Deputy Minister to Superintendents, as per attached draft

Attachment(s)
Draft letter of endorsement

Contact Information Department Name Department Phone # Department File	**JM**	**Agree / Disagree:**
	ADM initial	**Dave Byng** **Deputy Minister** 
		Date signed: Nov 12 2015

Dear [Superintendent's Name],

Computer programming is a very important part of today's digital literacy and the global economy. The Ministry of Education is working with educators across the province to ensure that the new curriculum will provide K-12 students in British Columbia with opportunities to experience coding and be aware of the many programming-related careers available to them.

The week for the annual Hour of Code event is rapidly approaching. During the week of December 8-14 2015, it would be wonderful to see your school district's students and teachers participating and embracing this opportunity. The Hour of Code site provides information and support for those who are familiar with coding and for those who are novices. Coding can assist with innovation across subject areas and provides the opportunity for problem solving, critical thinking and logic.

There is now a Canadian Hour of Code page and teachers should go to that page to sign up their class or school to participate.

Thank you for your support with this. If there is any further support or assistance you need as you invite your schools to participate in the Hour of Code, please contact xxxxxx

Sincerely,

Dave Byng
Deputy Minister of Education

MINISTRY OF EDUCATION
BRIEFING NOTE

DATE:
CLIFF:

PREPARED FOR: Dave Byng, Deputy Minister, for **Decision** at the request of the **Learning Division** for **coding implementation**.

SUBJECT: Coding Investment

BACKGROUND: As part of the BC Technology Strategy coding has been identified as a key component to support students to prepare for the jobs of tomorrow.

DISCUSSION: s.13
s.13

Assumptions
s.13

Training Plan s.13
s.13

s.13

Equipment/Resources s.13

s.13

s.12,s.13

DECISION:
Option 1 - s.13
Option 2 -

RECOMMENDATION:
s.13

Contact Information Department Name Department Phone # Department File		**Approved**
	ADM initial	**Dave Byng** **Deputy Minister**
		Date signed:

UK MODEL


GOAL: Have skills match jobs (coding specific)
ASSESS: Infrastructure and training are inadequate
ADDRESS: Improve infrastructure and training

Background

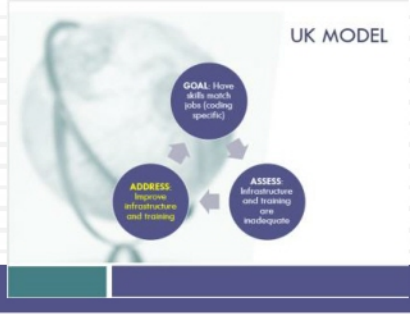
- **Background:**
- In September 2014 the subject of Information and Communications Technology (ICT) was replaced with Computing. The curriculum has three main strands: computer science, information technology and digital literacy. Every child at primary and secondary school (ages 5-16) will be taught computer science as a "foundational discipline", with coding a core component.
- First tried in the 2012 "ProgeTiiger" computer programming curriculum in Estonia:
- **Strategy:**
- Not vocationally driven: "We teach every child Science and English, even though they're not going to become English dons or scientists. But we want them to know some science, because we want them to know something about the world that surrounds them. In the same way we want them to know some of the elementary principles of computer science." Simon Peyton Jones, principal researcher at Microsoft Research and chair of the Computing at School (CAS) group
- **Challenges:**
- As in Estonia and the UK the change was met with teacher resistance and concern about lack of equipment and inadequate training. Also concern that the mandatory aspect will turn students off coding.

Process

1. **Build Up Infrastructure:** (UK-wide)
   - Broadband internet connectivity
   - Tools (mini-computer) for students starting high school
   - Collaboration between (IT) business, government, universities, and public

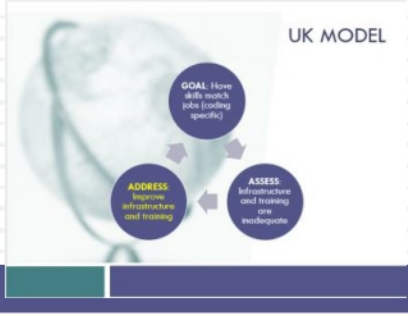
2. **Train Population:** (varies by country)
   - **Teachers:**
     - Scholarships, training pre-service and in-service teachers
     - Computing at School (CAS): UK-wide initiative for teaching computer science in schools.
   - **Students:**
     - Approaches ranges from incorporating coding in and across curriculum to making coding training mandatory for all students.
     - Out-of-school coding clubs

Process - England



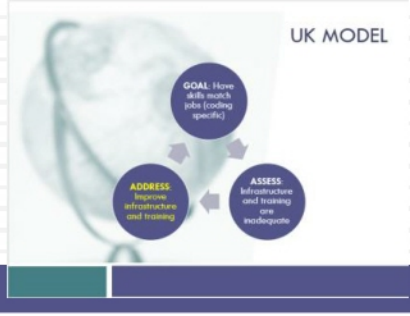
1. **Build up infrastructure:**
   - £1.3b Department for Education funding for broadband (2016)
   - Collaboration between (IT) business, government, universities, and public. Some partners are:
     - Royal Society of Engineering
     - Google
     - Microsoft
     - BBC
     - Raspberry Pi Foundation
     - LEGO Educaton WeDo
     - Naace
     - Universities (10)

Process - England



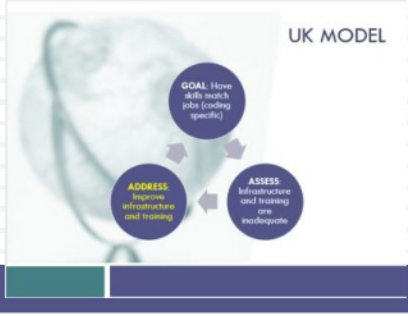
2. **Train population:**
   - **Teachers:** £3.6+ million government funding
     - 120 scholarships of £25,000 for pre-service computing teachers (2016)
     - Support for all teachers, with focus on computing teachers
       - CAS England
       - Network of Teaching Excellence for Computer Science Teachers
       - In-school workshops (approximately 800)
       - Master Teachers

Process - England



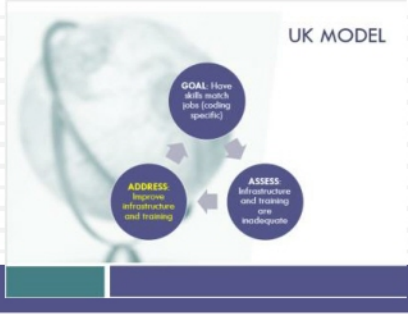
2. **Train population: (continued)**
   - **Students:**
     - Mandatory coding for ages 5-16 years (September 2014)
     - Out-of-school coding clubs and free online resources
       - Code Clubs for 9-11 year-olds, and CoderDojo, and Codecademy
       - Tynker, Hopscotch, ScratchJr and Hakitzu: free learn-to-code apps
       - Scratch programming language (used in schools, accessible online)
       - CBeebies and CBBC TV shows
       - Kano Build-It-Yourself Computer for children
       - Online coding contest Shaun the Sheep's Game Academy
       - Play-i robots

Process – Northern Ireland



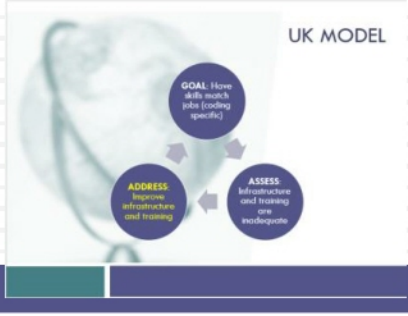
1. **Build up infrastructure:**
   - Superfast Rollout (broadband) Programme - £17m joint investment by government, Superfast Britain investment and BT.
   - EN(ni) (2012) - £170m over five years funding by government for Education Network for schools
   - C2k: Infrastructure and services to support ICT in schools
   - Momentum Digital Summit (2014) teacher training in ICT and coding supported by digital sector stakeholders, educators, governmental organizations
   - ICT Public/Private sector Apprenticeship Scheme: employment opportunities for 80+ young people.

Process – Northern Ireland



2. **Train population:**
   - **Teachers:**
     - CAS Northern Ireland
     - Parallel Teacher Training and Up-Skilling/Enablement Initiative
     - Professional Development Day for post-primary teachers at the beginning of the school year
     - Teacher coding training by Allstate, Kainos and Tascomi (private companies.)

Process – Northern Ireland

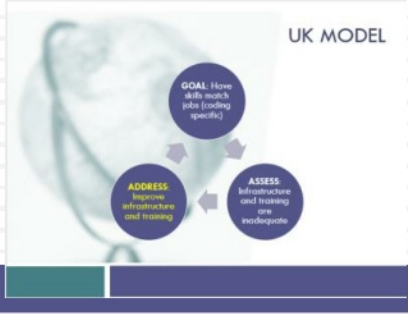


2. **Train population: (continued)**
   - **Students:**
     - Computer science credentials for senior years
     - Out-of-school coding clubs, free online resources
       - Scratch Clubs (online programming tool) and Python programming language (both offered in schools)
       - Logo programming language and tools Game Maker and Mediator
       - Computer Programming Environment (CPE) (designed to support GCSE and A-Levels)
       - Code Club, Coder Dojo, Miniversity, TechFuture Girls
       - *Its Your Choice*: Coding Initiative bursary scheme and career day: 13,000 students (age 7 to post-16 years)
       - SMART Technology (coding and programming) Program: 3,000 7-11 year old students.

Process – Scotland

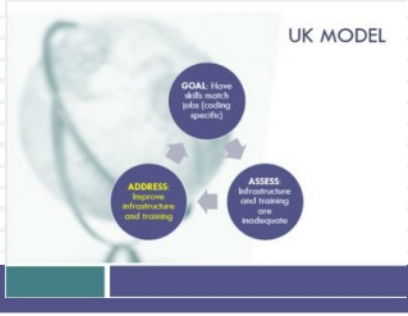
1. **Build up infrastructure:**
   - Digital Scotland Superfast Broadband Programme, Scottish Wide Area Network (SWAN), Rest of Scotland Project, Interconnect 2.0, Glow: broadband, online tools and resources
   - National Procurement Framework for Tablet and Notebook Devices (2013)
   - Collaboration between (IT) business, government, universities, and public. Private industry partners include:
     - Raspberry Pi Foundation, Academy of Computing, Royal Society of Edinburgh, British Computer Society, Arm, Microsoft and Samsung, Scotland's local authorities, European Regional Development Fund, BT, Oracle, and others.

Process – Scotland



2. **Train population:**
   - **Teachers:**
     - CAS Scotland
     - The Professional Learning And Networking in Computing (PLAN C) Project: £200,000 per year for two years to support teaching National 3, 4, 5 Higher and Advanced Higher Computing Science and Computational Thinking.
     - Education Scotland staff training materials for the new web development topics in Higher and Advanced Higher Computing Science.

Process – Scotland



2. **Train population: (continued)**
   - **Students:**
     - *Digital Learning Strategy* in development (2016)
     - Computer Science in ICT strand of 2011 Curriculum for Excellence
     - Out-of-school coding clubs, free online resources
       - Apps For Good course: Training on the app development cycle
       - Code Club and Coderdojo Scotland
       - Lambda Jam
       - Make It Digital (by BBC):
       - Digital Skills Apprenticeship Scheme (by BBC)
       - Computer Clubs For Girls licences and Java Fundamentals Training for 50 Scottish schools (by Tech Partnership's and sponsored by Oracle and Skills Development Scotland

Coding in Schools

GOAL: Students will graduate with the skills they need for a modern economy that includes coding.

SCOPE: s.13
s.13

SCHEDULE: s.13

APPROACH: s.13
s.13
s.13

s.13

NOTE: s.13
s.13

Byng, Dave A EDUC:EX

From:Byng, Dave A EDUC:EX
Sent:10 Mar 2016 07:08:52 -0800
To:Holme, Matt EDUC:EX
Cc:Turner, Julie EDUC:EX;O'Callaghan, Jacqueline EDUC:EX;Koolsbergen, Andrew EDUC:EX;Farkas, George EDUC:EX;McCrea, Jennifer EDUC:EX
Subject:Re: Coding - Options
Will do Matt.

Dave

Dave Byng
Deputy Minister
Ministry of Education
Province of British Columbia

On Mar 10, 2016, at 7:07 AM, Holme, Matt EDUC:EX <Matt.Holme@gov.bc.ca> wrote:

> Dave,
> The minister has some further direction on possible coding dollars based on a conversation he had last night at caucus.
> Please have George stand down on putting together options for now. We can chat further when you are here this afternoon.
> Thanks,
> Matt

August 2015 Technology Strategy and Coding

Current Status in Schools (Based on a June 2015 survey of districts and other information)**:**

s.13

- **Many high schools offer programming**, digital media, and other technology-related courses.
- There are a few **cases of exemplary practice**. Examples:
  - South Island districts that are working with **local gaming industry companies to provide work experience for students.**
  - Some districts are providing "Maker" events, which often include a coding component.
- **Many coding resources are available to schools and students free of charge**, i.e. Khan Academy instructional videos. Various non-profit organizations also put on coding events throughout the year.
- Two years ago, the Ministry released a **Digital Literacy Framework,** a set of guidelines for teachers to support the interest, attitude and ability of learners to appropriately use digital technology and communication tools.
  - The Framework has 6 categories; one of these, **Technology Operations and Concepts,** addresses coding-related outcomes for students.

New Curriculum

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Grades K-2:
s.13

Grades 3-5:
s.13

Grades 6-9:
s.13

Grades 10-12:
s.13

The Techology and Innovation Strategy

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Industry Involvement

- The **sector establishes recognized certifications** that many students can achieve while still in high school (Cisco, Microsoft, COMPTIA, for example). High schools in BC have locally-developed courses leading to these certifications. Achieving these certifications is also a foundation of the *FIT* program.
- **Industry representatives provided** the Ministry with **high-demand talent needs** for the *Career Zone: ICT* career education resource completed in May 2015.
- **Industry provides work-experience opportunities for high school students**, as the multimedia employers on southern Vancouver Island have done. This should increase through shoulder-tapper activities.
- **Industry partners with libraries and schools to support coding events** by contributing expertise or financial support.

Next 1-3 Years

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Expected outcomes:

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BC Coding Initiative

Project Charter

Purpose

The purpose of the BC Coding Initiative is to increase the number of young people in British Columbia with interest, experience, and ability in computer programming.

Guiding Principles

The BC Coding Initiative will:

1. Align with the Ministry of Education's education transformation initiative and a personalized approach to learning.
2. s.13
3. Partner with the Provincial Government, the BCTF (CUEBC, ETMN), the BCSSTA, the Tech sector, students and parents.

Governance

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Vision

- Raise the awareness of the importance of digital literacy in the education community generally.
- Raise BC students' interest in, awareness of, and skill at, computer programming.
- Improve BC students' level of digital literacy.
- Increase BC students' computational thinking skills.

Audience

- Elementary students
- Intermediate students
- Secondary students
- Teachers

Opportunities and Strategies

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BC Youth Coding Initiative

Status Update: November 3, 2015

By capitalizing on existing programs and helping to extend their reach, the Industry-led BC Youth Coding Initiative will increase the opportunities for BC students and teachers to experience computer programming.

Events

Dec. 7-13 Province-wide **Hour of Code** ongoing event

Dec. 5 Vancouver **Hour of Code** special event
Venue: Lighthouse Labs
Host: Lighthouse Labs
Contact: Sarah Veness, sarah@lighthouselabs.ca
Estimated participants: 80

Dec. 12 Victoria **Hour of Code** special event
Venue:
Host: MetaLab
Contact:
Estimated participants: 50

Dec. 12 Prince George **Hour of Code** special event
Venue: Centre for Learning Alternatives, John McGinnis School
Host: Innovation Central Society (ICS)
Contact:
Estimated participants: TBD (securing school gymnasium space)

January 23 Kelowna **Hour of Code** special event
Venue: EME building, UBCO
Host: University of BC Okanagan (UBCO)
Contact: Bill Latta, bilatta@mail.ubc.ca Susan Crichton, susan.crichton@ubc.ca
Estimated participants: TBD

Resources

1. **Hour of Code Teacher Packages** :
   The HoC Teacher Package consists of 1 cover letter, 1 participation guide brochure, 1 handout, 2 sheets of stickers, 8 posters (2 copies each of 4 versions).
   https://hourofcode.com/ca/en/resources/promote#posters

   Packages were distributed to approximately 500 CUEBC members at the CUEBC conference in October.

2. **Teachers' Guide to Coding web resource**:

The Guide will be a living document (website) that can be continuously updated and maintained to connect teachers to pedagogical frameworks for coding initiatives and then to an assortment of existing age / grade-appropriate resources to use. The site will facilitate 2-way communication between teachers to review and comment on resources, similar to a Yelp for age-appropriate coding resources, specifically linked to the new K-9 Applied Design, Skills, and Technologies (ADST) curriculum. The Guide will help teachers integrate coding experiences for students into the new curriculum, and assist teachers with the implementation of the ADST curriculum.

Immersive professional development around the resource will occur at the CUEBC conference in October, 2016.

3. **New *Applied Design, Skills, and Technologies* Curriculum**

Partners	Contribution
BCIC	Promotion of the events
BC Ministry of Education	$35,500, consultation
Hour of Code	Production assets for teacher packages
BCTF (BC Teachers Federation) via CUEBC (Computer Using Educators of BC)	Financial administration, resource development, consultation
UBC Okanagan (Host: Kelowna)	Event host
ICS (Innovation Central Society) (Host: Prince George)	Event host
Lighthouse Labs (Host: Vancouver)	Event host, coding curriculum, and lead instructor for events
MetaLab (Host: Victoria)	Event host
BC universities & colleges via the BCCEC (British Columbia Computing Education Committee)	
ViaTec	Promotion of events
McClaren McCann (National ad agency)	Brand identity for event
UNBC	Volunteer mentors for Prince George event
Panago Pizza	Pizza for Vancouver event
City of Prince George	Mayoral endorsement and community promotion
SD57 - Prince George	School district partner for Prince George event
Microsoft Canada	Volunteer mentors for Vancouver event, loaner laptops, $1,000
First Nations Technology Council	Loaner laptops for First Nations students
ACL	$1,000
Mobify	$1,000

BC Youth Coding Event – Letter to District Partners

Overview
The BC Youth Coding Event is a mass youth coding event hosted in celebration of the global computer science and digital literacy awareness campaign called the "Hour of Code". During Computer Science Week from December 7 to 13, four major cities in BC (Victoria, Vancouver, Kelowna and Prince George) will host the event where up to 100 kids from age 8 to 18 per community will get together for half a day to learn how to code for *free*. The initiative is supported by the Ministry of Education, BCTF's (BC Teachers' Federation) CUEBC (Computer Using Educators of BC) and our host partners in each region.

Our Objectives
The objectives of the BC Youth Coding Event are to:

- Provide youth in BC with exposure to coding education for free
- Raise the awareness of the value of coding and computer science to the general public
- Inspire youth to consider a career in technology, especially girls, in order to promote gender equality in computer science
- Engage in a dialogue with the key stakeholders who are part of a student's upbringing and education, in the importance of digital literacy

Target Demographics

- Youth from ages 8 to 18
- Parents
- Educators and career counselors

Participating Cities, Hosts and Event Dates

- December 5 - Vancouver, hosted by Lighthouse Labs
- December 12 - Prince George, hosted by Innovation Central Society
- December 12 - Victoria, hosted by Metalab
- January 2016 - Kelowna, hosted by UBC Okanagan

What will happen during the events?
The events will be half day affairs with up to 100 kids and 20 or more industry developers as mentors. A lead instructor will first provide a short lecture about coding. The students will then break off to work on a hands-on project with curriculum donated by our Learning Partner, Lighthouse Labs. Mentors will be available to help the kids with their project and engage in conversations about careers in technology. Within a couple of hours, the kids will go home with a project that they can show off to their parents and teachers!

Why should you participate as a district partner?
Our mission is to raise awareness of the importance of coding and computer science education for our next generation. By partnering as a school district, you are demonstrating your district's commitment towards the same goal. We rely on districts like yours to be able to help provide the students in BC with the exposure to computer science, so that we together, can inspire them to gain new vital skills and even consider a career in technology. When you join us as a district partner, you will be directly contributing to the education for the next generation and will be tied to the positive and transformative experiences, that is the BC Youth Coding Event in your community.

What we need from district partners

- Assist your community's host partner with securing a venue, such as a school gymnasium, if needed. We'll need to know what the capacity of your venue is.
- Assist your community's host partner with securing event equipment, if needed. For example:
    - Chairs
    - Tables (round tables preferred)
    - Projector and projection screen for lead instructor
    - Mics, speakers and other applicable AV equipment
- Promote the event to the schools, parents, teachers, and students in your district
- Provide pre-event registration, post-event pickup or transportation and event supervision during the event for the students that you bring
- Assist with sourcing laptops for students who need access
- Assist in getting parent or guardian signatures for student release forms before the event

What your community host partner and we will do to help

- Community host partner that would help organize the event
- Instruction from a Lead Instructor and hands-on project curriculum sponsored by our Learning Partner, Lighthouse Labs
- Mentors to teach the students during the hands-on portion of the event
- General event volunteers during the event
- Food and refreshments for the students

Seward, Myrna EDUC:EX

From: Hawkes, Mark EDUC:EX
Sent: Wednesday, June 17, 2015 11:12 AM
To: Martin, Mari EDUC:EX
Cc: Winkelmans, Tim EDUC:EX; 'Melody'
Subject: BC Youth Coding Initiative
Attachments: s.13

Hi, Mari:

I'm the Ministry's E-Learning Coordinator, I work in the Learning Division on the 4th floor with Tim Winkelmans. I've been collaborating with Melody Mah of the Technology sector on a project to promote coding opportunities for BC students. This initiative is one component of government's new Technology and Innovation Strategy.

s.13

Thanks,

Mark

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PROVINCE OF BRITISH COLUMBIA
MINISTRY OF EDUCATION

CONTRACT AMENDMENT # 1

Contract Number: C16/0892

This AGREEMENT dated for reference the 16th day of October, 2015

BETWEEN: **HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA represented by the Minister of Education (herein called the "Province")**

OF THE FIRST PART

AND:

British Columbia Teachers' Federation (herein called the "Contractor" or "Recipient")

OF THE SECOND PART

WITNESS THAT WHEREAS:

A. The parties hereto entered in an Agreement dated for reference the 16th day of October, 2015, and subsequently amended on the 4th day of March, 2016, copy of which is attached hereto as Appendix "1" (hereinafter called the "Agreement"),

B. **AND WHEREAS** the parties have agreed to amend the Agreement.

NOW THEREFORE in consideration of the covenants and agreements herein contained, the parties agree as follows:

(1) That Schedule 'A' shall be amended to read as follows:

PART 1. TERM:

1. The term of this Agreement commences on October 16, 2015 and ends on September 30, 2016

PART 2. SERVICES:

2. On or before March 14th, 2015: the creation of a draft framework to an online ***Teachers' Guide to Coding Resources***. The Guide will be a living document (website) that can be updated and maintained to connect teachers to pedagogical frameworks for coding initiatives and then to an assortment of existing age / grade-appropriate resources to use. The site will facilitate 2-way communication between teachers to review and comment on

resources, similar to a Yelp for age-appropriate coding resources, specifically linked to the new K-9 Applied Design, Skills, and Technologies (ADST) curriculum. The Guide will help teachers integrate coding experiences for students into the new curriculum, and assist teachers with the implementation of the ADST curriculum.

3. On or before September 1st, 2015: the creation of a final version of an online ***Teachers Guide to Coding***. The finished Guide will include any Ministry-requested changes to the first version. The cost of making these changes may not exceed the value of the two payments for the Guide.

(2) That, in all other respects, the terms and conditions of the Agreement remain unchanged.

The parties hereto have executed this Agreement on the day and year as set out above.

SIGNED AND DELIVERED by the Contractor or Recipient or by an Authorized Representative:

Dan Johnston

(Print Name of Contractor, Recipient or Authorized Representative)

(Signature)

SIGNED AND DELIVERED on behalf of the Province by an authorized representative of the Province.

Tim Winkelmans

(Print Name of Authorized Representative)

(ACTING)

(Signature)

Codecreate Debrief Meeting

1-4 pm, Thursday, Feb 18
TRB office
Suite 400-2025 West Broadway

Invitees:

GENERAL
Melody Ma, melody.yy.ma@gmail.com
Mike Silverton, mike.silverton@sd68.bc.ca
Jon Hamlin, JHamlin@sd43.bc.ca
Sarah Hagerman, sarah_hagerman@acl.com ACL (tech company that sent volunteers to sites)

VANCOUVER
Jeremy Shaki, jeremy@lighthouselabs.ca, Lighthouse Labs CEO

Don Burks, don@lighthouselabs.ca, Lighthouse Labs Lead Instructor

Audrey Van Alstyne, avanalstyne@vsb.bc.ca

VICTORIA
Tim Wilkinson, tim@metalab.co, MetaLab COO

Dave Shortreed, dshortreed@sd61.bc.ca, Victoria SD 61 Coordinator Educational Technology

OKANAGAN
Susan Crichton, susan.crichton@ubc.ca UBCO

Mark Marino, teacher SD83, mmarino@sd83.bc.ca (attended Kelowna event)

PRINCE GEORGE
Shauna Harper, shauna@liveworkcommunications.com, Innovation Central Society, Prince George Codecreate Host, Premier Tech Advisory Council, JTST Tech Working Group

Monica Berra, mberra@sd57.bc.ca

Sagar Saxena, Sagar.Saxena@unbc.ca UNBC

Hour of Code and Codecreate Programme Report - 2015/2016

Prepared by: Melody Ma

Last revision date: January 26, 2016

Programme Summary

The Hour of Code campaign was celebrated during December 7 to 13, 2015. It is a global grassroots initiative aimed to raise awareness for computer science education. We ran an educator-focused awareness campaign to increase engagement of BC classrooms in Hour of Code. In addition, marquee BC Hour of Code events, Codecreate, was held from December 5, 2015 through Jan 23, 2016 in four BC communities (Vancouver, Victoria, Prince George, Kelowna) to provide up to 400 students aged 8 to 18 the opportunity to get exposed to coding for free. The primary supporters of this initiative was the Government of B.C.'s Ministry of Education and BCTF's PSA, Computer Using Educators of BC (CUEBC).

Our Objectives

The objectives of this programme was to to:

- Provide youth in BC with exposure to coding education for free
- Raise the awareness of the value of coding and computer science to the general public
- Inspire youth to consider a career in technology, especially girls and aboriginal students, in order to promote gender equality and diversity in computer science
- Engage in a dialogue with the key stakeholders who are part of a student's upbringing and education, in the importance of digital literacy
- Increase the classroom engagement in the Hour of Code campaign

Target Demographics

- K-12 students in BC
- K-12 educators in BC
- Parents of K-12 students in BC

Codecreate Participating Cities, Host Organization and Event Dates

- December 5 - Vancouver, hosted by Lighthouse Labs
- December 12 - Prince George, hosted by Innovation Central Society @ Centre for Learning Alternatives, John McGinnis School
- December 12 - Victoria, hosted by Metalab
- January 23, 2016 - Kelowna, hosted by UBC Okanagan

Codecreate and Hour of Code Official Web Properties

Twitter: https://twitter.com/CodecreateBC
Codecreate Website: http://codecreate.ca/
Hour of Code Website: https://hourofcode.com/ca

Programme Tactics

Category	Tactic	Purpose	Date Delivered
Hour of Code	Initial Hour of Code emails to all BC Superintendents from BC Hour of Code Lead	Awareness	Summer to Fall 2015
Hour of Code	Hour of Code Teacher Packages (contains stickers, posters, welcome and how-to brochures). These were handed out during CUEBC fall conference.	Awareness Classroom engagement	Oct 23
Hour of Code	Ongoing support to BC school districts, educators and parents on Hour of Code	Awareness	Summer to Dec 13
Hour of Code	CUEBC Coding for educators session during CUEBC fall conference	Educator education	Oct 23
Hour of Code	Deputy Minister of Education Letter to BC Superintendents	Awareness	Nov 20
Hour of Code & Codecreate	CUEBC Promotion of Hour of Code and Codecreate	Awareness and Outreach	Dec 1 to Jan 23
Codecreate	Codecreate events - marquee Hour of Code events	Outreach	Dec 5 to Jan 23
Hour of Code & Codecreate	Government of B.C. Press Release	Awareness	Dec 4
Hour of Code	BCEdChat topic on Hour of Code	Awareness	Dec 6
Hour of Code & Codecreate	Community PR outreach	Awareness	Dec 1 onwards
Hour of Code	Industry volunteer outreach drive for classroom volunteers for Hour of Code	Outreach	Dec 1 to 13

Codecreate Partners and Sponsors

	Partners/Sponsors
General	Organizing Partners: Government of B.C., CUEBC, Hour of Code Supporting Partners ($3k or in-kind equivalent): ACL Community Partners ($1k): Microsoft, Mobify Learning Partner (Curriculum development, instructor for 3 communities, graphic design for offline materials): Lighthouse Labs Codecreate Branding Partner: McClaren McCann Food & Beverage Partner: Panago Pizza

	Offline Coding Activity: LittleCodr Promotional Partners: CUEBC, First Nations Technology Council, BCCPAC, BCPVPA, BCIC, City of Vancouver, Government of B.C.'s Ministry of Education
Codecreate Vancouver	Host Partner: Lighthouse Labs Schools Districts: Vancouver School Board (brought laptops for all attendee and promotion)
Codecreate Victoria	Host Partner: MetaLab Schools Districts: Victoria School Board (promotion)
Codecreate Prince George	Host Partner: Innovation Central Society Schools Districts: School District 57 (organization and promotion) Supporting Partner ($3k): UNBC Research Food Sponsors: Costco, and Tim Hortons Volunteers: ACL (Flew 3 sponsored volunteers due to expertise shortage in community)
Codecreate Kelowna	Host Partner: UBC Okanagan Innovate Learning Centre Schools Districts: Kelowna School Districts

Hour of Code Results

Events by Province

Province	2015 Events	2014 Events	Difference	% Difference
Ontario	1,909	1019	+890	+87.34%
British Columbia	**693***	**177**	**+516**	**+291.53%**
Nova Scotia	618	134	+484	+361.19%
New Brunswick	420	205	+215	+104.88%
Alberta	405	128	+277	+216.41%
Manitoba	198	72	+126	+175.00%
Quebec	172	33	+139	+421.21%
Saskatchewan	114	34	+80	+235.29%
PEI	36	10	+26	+260.00%
Newfoundland	28	5	+23	+460.00%

# of Sessions and New Users by Province

Province	Sessions	New Users
Ontario	289,244	209,990
British Columbia	**88,856**	**59,658**
Nova Scotia	72,645	55,541

Alberta	63,161	45,017
New Brunswick	25,985	18,286
Manitoba	22,125	15,897
Quebec	15,446	10,403
Saskatchewan	14,634	10,943
Newfoundland and Labrador	7,442	5,681
Prince Edward Island	6,819	4,698
Total	**612,211**	**439,772**

In-School vs Out-of-School Event Count in BC

	2015 Events	**2014 Events**
In-school	**611**	**165**
Out-of-school	56	12
Total	**667***	**177**

*Please note that the starred numbers do not match due to data source issues. The most accurate number is the 693 total BC events number.

List of all participating events in BC:
https://docs.google.com/spreadsheets/d/1zddiHdBwiMh07kM4itkO5d5TDZDc8r6uRiRpxtoxk2E/edit?usp=sharing

Events by Country (Top 5)

Country	**2014 Events**	**2015 Events**	**Delta events**	**Growth rate**	**Population**	**2015 events per capita**
United States	37,925	71,116	33,191	1.88	322,452,000	0.0002205475544
Italy	5,679	11,028	5,349	1.94	60,725,000	0.000181605599
Canada	**1,854**	**4,772**	**2,918**	**2.57**	**35,851,774**	**0.0001331035948**
United Kingdom	1,138	2,489	1,351	2.19	64,800,000	0.00003841049383
Turkey	276	2,443	2,167	8.85	77,695,904	0.00003144309898

Sessions by Country (Top 5)

Country	**# sessions**	**# total sessions**	**% of total global sessions**
United States	13,955,802	18,952,044	73.64%

Russia	1,410,743	18,952,044	7.44%
Canada	**612,211**	**18,952,044**	**3.23%**
United Kingdom	553,687	18,952,044	2.92%
Italy	215,056	18,952,044	1.13%

Codecreate Results

	Vancouver	Victoria	Prince George	Kelowna	Total
# of Total Registrants	65	45	88	106	304
# of Youth Registrants (inclusive of FNTC)	60	44	88	106	298
# of FNTC Youth Registrants	4	0	1 (Note that there were many aboriginal youths although FNTC registrants were low)	3	8
# of CUEBC Teacher Registrants	5	1	0	0	6
# on Waitlist	84	12	17	94	208
Girls to Boys Ratio for Youth	20:35 36%/64%	19:25 43%/57%	38:50 43%/57%	27:79 25%/75%	104:189 35%/65%
Youth Age Ranges	8 to 10: 16 (29%) 11 to 13: 19 (35%) 14+: 13 (24%) Unknown: 7 (13%)	< 8: 1 (2%) 8 to 10: 25 (57%) 11 to 13: 13 (30%) 14+: 5 (11%)	< 8: 1 (1%) 8 to 10: 41 (47%) 11 to 13: 35 (40%) 14+: 11 (13%) Unknown: 1 (1%)	8 to 10: 32 (30%) 11 to 13: 43 (41%) 14+: 23 (22%) Unknown: 8 (7%)	< 8: 2 8 to 10: 114 11 to 13: 110 14+: 52 Unknown: 16
Youth Home Location	Surrey: 11 Vancouver: 10 North Van: 10 Coquitlam: 10 Burnaby: 6	Victoria: 36 Duncan: 2 Nanoose Bay: 2 Sooke: 1	Prince George: 86 Vanderhoof: 1 Summit Lake: 1	Kelowna: 44 Vernon: 17 Salmon Arm: 9 West	

	Delta: 3 Mission: 2 New West: 1 Pitt Meadows: 1 Richmond: 1	Nanaimo: 1 Delta: 1 Surrey: 1	Fort St. James: 1	Kelowna: 6 New Denver: 6 Kamloops: 4 Coldstream: 4 Chase: 3 Oliver: 3 Falls: 2 Sicamous: 2 Okanagan Valley: 2 Armstrong: 1 Enderby: 1 Malakwa: 1 Merritt: 1 Nakusp: 1 Penticton: 1	
How did you hear about the event? Youth Attendees	Word-of-Mouth(WOM): 27 Email: 9 Newspaper: 7 Facebook (FB): 4 Website: 3 Twitter: 2 Search: 1 Other: 7	WOM: 25 Email: 4 Website: 4 Newspaper: 2 FB: 3 Twitter: 1 Other: 10	FB: 41 WOM: 23 Email: 11 Twitter: 3 Website: 1 Search: 1 Other: 10	WOM: 40 Email: 23 Website: 7 FB: 7 Twitter: 3 Newspaper: 2 Other: 29	WOM: 115 FB: 55 Email: 47 Newspaper: 11 Website: 15 Twitter: 9 Search: 2 Other: 56
# of Mentors	29	18	21	42	110
Political Representatives/ VIPs support	Deputy Mayor, City of Vancouver Chief Digital Officer	Mayor, Ministry of Education, UVic	Mayor, Minister of Jobs, Tourism and Skills Training, UNBC Research Head	Mayor, Kelowna-Mission MLA	

Event Photos:
Vancouver:
https://drive.google.com/folderview?id=0B1FVR4BTE_UrLTFWa3BPTVRTXzg&usp=sharing
Prince George:
https://drive.google.com/folderview?id=0BwNVW_ROfFYDcUFEMUdVWUNBRUE&usp=sharing

Victoria:
https://drive.google.com/folderview?id=0B1FVR4BTE_UrQUlxQkV5eUd5dmM&usp=sharing
Kelowna:
https://drive.google.com/folderview?id=0B1FVR4BTE_UrcDBxX1BaQVcwLTQ&usp=sharing

Media Coverage
Vancouver
Vancouver Sun:
http://www.vancouversun.com/life/next+generation+code+crackers+gather+gastown/11569103/story.html
The Province: http://blogs.theprovince.com/2015/11/27/vancouver-lab-to-host-400-students-in-b-c-s-largest-youth-coding-initiative/
24 Hours Vancouver: http://vancouver.24hrs.ca/2015/11/17/largest-youth-coding-event-comes-to-bc
CBC Radio Canada: http://www.radio-canada.ca/util/postier/suggerer-go.asp?nID=1296951
CBC Vancouver TV
Ming Pao Vancouver Newspaper:
http://www.mingpaocanada.com/Van/htm/News/20151206/vas3_r.htm
Business in Vancouver: https://www.biv.com/article/2015/12/coding-bootcamps-gain-traction-number-grads-double/
TriCity News: http://www.tricitynews.com/news/new-b-c-curriculum-to-include-coding-1.2120902, http://www.tricitynews.com/lifestyles/free-coding-camp-for-kids-saturday-at-pmpl-1.2124154
BetaKit: http://betakit.com/lighthouse-labs-hosting-largest-youth-coding-event-in-b-c/
CanTech Letter: http://www.cantechletter.com/2015/11/codecreate-to-offer-workshops-for-400-students-across-british-columbia/
The Other Press: http://theotherpress.ca/codecreate-organized-as-tribute-to-hour-of-code/
Asian Pacific Post: http://www.asianpacificpost.com/article/7263-celebrating-hour-code.html
WestCoast Families
SD43: https://www.sd43.bc.ca/CommunityNews/Pages/HourofCodeWeek.aspx
BCPVPA Newsletter: http://bcpvpa.bc.ca/wp-content/uploads/2015/11/eNews111315.pdf

Victoria
CHECK TV: http://www.cheknews.ca/5pm-newscast-dec-12-2015-126540 (8:40 mark)
Douglas Magazine: http://www.douglasmagazine.com/victoria-students-to-celebrating-the-hour-of-code-at-codecreate/

Prince George
The River 101.3 Radio: http://www.1013theriver.com/2015/11/25/10438/
Vista Radio: 94.3 The Goat & Country 97
My Prince George Now: http://www.myprincegeorgenow.com/24445/24445/
CKPG Pre event: http://www.ckpg.com/2015/12/11/teaching-kids-to-code
CKPG during event: http://www.ckpg.com/2015/12/13/15282/

Kelowna
Kelowna Now:
https://www.kelownanow.com/watercooler/news/news/Central_Okanagan/16/01/21/The_Largest_Youth_Coding_Event_in_the_B_C_Comes_to_UBCO/
Kelowna Capital News: http://www.kelownacapnews.com/news/366217591.html
Penticton Infonews.ca: http://infotel.ca/newsitem/ubc-okanagan-helping-province-bring-coding-to-local-classrooms/it27150
Global News: http://globalnews.ca/news/2473699/kids-coding-a-trend-b-c-is-pushing-for/
Kelowna Daily Courier: http://www.kelownadailycourier.ca/news/local_news/article_2e4d3976-c253-11e5-add4-ff78a64f54b1.html
UBC Okanagan: https://news.ok.ubc.ca/2016/01/21/ubc-okanagan-hosts-province-wide-codecreate-event/

Feedback
Please note that quality of feedback from each event varied as collecting feedback was the responsibility of the host organization.

Vancouver
"I enjoyed seeing some of the kids really enjoying what they do" - Mentor
"Smaller groups. More interesting project that is not just changing a config file." - Mentor
"Events like that are important" - Mentor

Victoria
"I had quite a bit of fun at the event in Victoria. Super appreciate, and am very impressed, with the fact that and extra laptop was found for me to use! I think the students had a really great time and learned a lot. From a teacher perspective I was looking forward for meeting other educators and learning from/with them, so I was disappointed that there were not more teachers there. I would definitely take another workshop hosted by you if there were other teachers/adults there that were also learning with me! Thank you for having me; it was a good experience overall :)" - Teacher

"To all the amazing staff and volunteers that made Codecreate Victoria happen,
My son participated in the event today. I wanted to pass along my gratitude to everyone who helped make today happen. my son received a gifted designation last May and he's been disengaged from school and very uninspired. He struggles with anxiety and finding an outlet for his creativity. However, every since we heard about Codecreate Victoria it's like a little fire has been lit inside him. He's been using Hopscotch to create games in preparation for today's event and learning basic coding concepts. Leading up to the event, the spark inside him has been evident and he's been so excited to share the mini games he's created with his teachers and peers and to think all this happened because of your event today. Then even after spending the whole day coding with all of you, he was so excited to come home and demonstrate what he learned today and teach us how to code. He spent an hour teaching our international exchange

student how to make changes to the game. To think all of this was inspired by all of you - THANK YOU! It brought tears to my eyes to see my son inspired and challenged by such a positive group of people. When I asked him about the mentors he said, "The people were fun and knew lots of things like me!" There is no longer a gifted program for my son and he is forced to fit into a cookie cutter mold of a "typical" student in the school system and for him today was just a little glimpse into a world that he feels apart of. As soon as we left Metalab, he ask, "When do I get to go back?" - Parent

Prince George
Please see detailed reporting from Prince George host organization, ICS here: https://drive.google.com/open?id=0B1FVR4BTE_UrMmZlRmZoY3lyVjQ5RWJRYWhLS2RRMC1xOVFv

"Speech was long (narrow down details - don't talk about EVERYTHING)" - Student, 11
"I would definitely recommend this to my friends. It is SUPER fun! I wouldn't change a THING! (Especially the pizza lunch!)" - Student, 10
"I like that this is something different to do. The lesson was a good length. More breaks during talk next time please" - Student, 13
"I want to know how to build a CPU" - Student, 10
"I would recommend this event because I can shoot horses. HORSES!" - Student, 13
"Cool that there are lots of kids from different schools" - Student, 11
"Next time I would split kids into levels (beginner, advanced)" - Student, 9
"Long time for just coding (a 10 minute break, small snack or game)" - Student, 11
"More instruction or explanations for how to navigate menus" - Student, 11
"Easier to understand interface (overwhelming information)" - Student, 11
"Do this more often so we can know more concepts" - Student, 10
"Next time... do in the afternoon so I don't have to get ready so early" - Student, 9
"Add more games to event (more choice)" - Student, 12
"Different game styles (not shooting)" - Student, 11
"More game selection" - Student, 11

"Great event that was short and impactful. More tech related programming in PG please!" - Mentor
"More (shorter) modules over several weeks" - Mentor
"It's great to learn about the aspect of programming, but more opportunity to actually program is needed!" - Mentor
"More please! More!" - Mentor
"More opportunities for kids to walk around to see what others are doing (screenshare?)" - Mentor

"Maybe split older kids & younger kids, pre-train parents to help with younger" - Parent
"Please turn this into a longer term program" - Parent

"Code IS the new literacy. It is just another language" - Sponsor

"We need to emphasize getting kids to learn code" - Sponsor
"Keep the fire going! Great youth event!" - Sponsor
"Exciting first step for kids to keep learning how to code" - Sponsor
"Community-led learning" - Sponsor

Kelowna
What do you like about coding?
"Developing critical thinking skills in a fun creative way" - Student
"Thank you! You did an exelant [sic] job of presenting and you were all very helpful" - Student
"Programming is awesome" - Student
"You can be anything! :)" - Student
"Math, numbers, creative fun, creating" - Student

What did you like about Codecreate?
"Coding is so much fun" - Student
"Codecreate is so much fun!" - Student
"awesome" - Student
"Creating my own game (And being the person who can change it)" - Student
"Favourite coding website" - Student
"Amazing when we got to do what we wanted to do!" - Student
"So much fun!"
"I love experiment on the computer. Go Code Create!" - Student

Recommendations

1. Continue the province's Hour of Code campaign participation annually in BC.
    a. Similar to New Brunswick, Nova Scotia and PEI, the Government of B.C. should consider appointing a lead staff person and/or a lead from a backbone organization to participate on behalf of the province.
2. Start Hour of Code campaign and Codecreate planning earlier.
    a. Work with Code.org Hour of Code team to establish timelines for printing materials, etc. to see if there are efficiencies that can be found (e.g. printing).
    b. Start contacting school districts about Hour of Code before school ends in summer.
    c. Establish sponsorship and partners for Codecreate in early summer.
3. Provide teacher-focused training opportunities, resources and support.
4. Explore coding learning opportunities for ages 6 to 8.
5. Explore, create and promote opportunities to further involve girls, aboriginal students and other underrepresented groups.
6. Consider age, skill-set, gender, venue, and available skilled resources differences when designing curriculum and learning opportunities.
7. Establish a backbone organization to create a roll-out plan to drive a scalable and sustainable programme across the province using a community-driven collective impact model that includes stakeholders in education (parents, teachers, students, administrators), non-profit, industry and government. Details on what a backbone

organization is: http://www.collaborationforimpact.com/the-how-to-guide/how-to-subpage-2/. Example Canadian backbone organizations include Brilliant Labs and Startup Canada.

8. Collaborate with other Government of B.C. ministries, such as Technology, Advanced Education, and Jobs, Tourism, and Skill Training, to create comprehensive roll-out and continual support strategy and to strengthen government resources to support programming.

Coding-related Curriculum Content (DRAFT)

Grades K-2

The student:

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Grades 3-5

The student:

s.13

Grades 6-9

Computational Thinking

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Computers and Communication Devices

- Computers are devices that execute programs.
- The relationship between hardware and software.
- Simple hardware and software problems that may occur during use.
- Various operating systems and the differences between them.
- Designing, writing and debugging programs that accomplish specific goals, such as controlling or simulating physical systems.
- Solving programmatic problems by decomposing them into smaller parts.

Grades 10-12 (To Be Developed Further)

The student:
s.13

Coding Strategic Planning

1. **Current Status in Schools** (Based on a June 2015 survey of districts and other information):

- Minimal level of activity across the K12 system.
- **Many high schools offer programming**, digital media, and other technology-related courses.
- There are a few **cases of exemplary practice**. Examples:

o South Island districts that are working with **local gaming industry companies to provide work experience for students.**

o Some districts are providing "Maker" events, which often include a coding component.

- **Many coding resources are available to schools and students free of charge**, i.e. Khan Academy instructional videos. Various non-profit organizations also put on coding events throughout the year.
- Two years ago, the Ministry released a **Digital Literacy Framework,** a set of guidelines for teachers to support the interest, attitude and ability of learners to appropriately use digital technology and communication tools.
    - The Framework has 6 categories; one of these, **Technology Operations and Concepts,** addresses coding-related outcomes for students.

SD	Comments

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New Curriculum

Within the new curriculum, **coding** is included in **Applied Design, Skills, and Technologies** (formerly Applied Skills). As students move through the system, they are exposed to coding and related programs as follows:

Grades K-2:

- Students understand the basics of hardware and software and how they work together.

Grades 3-5:

- Students create simple computer programs using tools such as Scratch or Logo.

Grades 6-9:

- Students explore Information and Communications Technologies (ICT) concepts in greater depth through three new modules:
- Digital Literacy/Citizenship
- Computational Thinking (precursor to coding at higher levels)
- Computers and Communications Devices

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Grades 10-12:

- Students identify and explore career options in ICT.

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Page 049 to/à Page 053

Withheld pursuant to/removed as

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MISC.

CUEBC (Computer Using Educators of BC)

http://cuebc.ca/cue/2016/01/21/bcs-new-coding-curriculum/

- This website is current and explains to teachers what is going on right now with coding in B.C.
- We call on our provincial government to back up this exciting new curriculum with financial investments to support teacher training, reliable high-speed network access for all students, and hardware upgrade grants for districts.

Computer Science Unplugged

http://csunplugged.org/

- has great resources for students to do "coding" without computers

BC Technology for Learning Society (HB Teo is on their Board of Directors)

- They deliver Industry Canada's *Computers for Schools* program in BC
- They offer three programs, Computers for Schools, Computers for Students, and the Technical Work Experience Program, in order to provide British Columbian's with access to affordable technology and valuable work experience.

Seward, Myrna EDUC:EX

From: Hawkes, Mark EDUC:EX
Sent: Tuesday, August 25, 2015 9:10 AM
To: Arthurs, Tony S EDUC:EX
Subject: s.13

Importance: High

Hi, there:

s.13

Mark Hawkes
E-Learning Coordinator
Learning Division
BC Ministry of Education
250-217-5567

New Curriculum:
Applied Design, Skills, and Technologies

Grades K-2:
Students understand the basics of hardware and software and how they work together.

Grades 3-5:
Students create simple computer programs using tools such as Scratch or Logo.

Grades 6-9:
Students explore Information and Communications Technologies (ICT) concepts in greater depth through three new modules:

- Digital Literacy/Citizenship
- Computational Thinking (precursor to coding at higher levels)
- Computers and Communications Devices

All students will experience coding by the end of Grade 9.

COMPUTATIONAL THINKING

New Curriculum:
Applied Design, Skills, and Technologies

Grades 10-12:

Students identify and explore career options in ICT.

Students that are interested in ICT sector careers gain in-depth training, experience, and certifications through:

- special modules, such as a coding module for Skills Exploration 10-12 that will focus on coding skills needed for trades such as machinist (to be completed for use in September 2016)
- new and updated provincial courses
- locally-developed courses
- dual-credit transition programs with post-secondary institutions
- work-experience placements with employers.

COMPUTATIONAL THINKING

Seward, Myrna EDUC:EX

From: Hawkes, Mark EDUC:EX
Sent: Tuesday, March 8, 2016 5:16 PM
To: Stephen Price; Jon Hamlin; Mike Silverton; Mohd A; 'jfitzgibbon@bccat.ca'; 'diana@sfu.ca'; 'fasreach@sfu.ca'; 'rarkiletia@vsb.bc.ca'; 'joyce_c@surreyschools.ca'; 'Sali@vsb.bc.ca'
Cc: Couture, Nicole M EDUC:EX; Winkelmans, Tim EDUC:EX; anita chapman; Munro, Brent D EDUC:EX; Walt, Nancy J EDUC:EX
Subject: CS12 curriculum revision planning session

Importance: High

Hello, all:

The next meeting of the Applied Design, Skills and Technologies (ADST) curriculum development team will be from Monday, April 4th to Wednesday, April 6th at the Saanich Room (rm. 207), Harbour Towers Hotel, in Victoria. The ICT sub-committee of Mike Silverton and Jon Hamlin will be joined on the first two days by Lower Mainland educators Seema Ali, Robert Arkiletian, and Cam Joyce, to work on a revised Computer Science 12 curriculum.

In preparation for that session, we would like to bring you all together to discuss this revised version of CS12...possibly as a Math curriculum. The Ministry will cover teacher release time and travel expenses, including overnight accommodation to allow you to come to Victoria the day before the meeting.

Please let me know which dates in March work for you and we will go with the one that suits the most people. The exact location of the meeting will be determined once we have a date selected.

Please let me know if there is anyone else you think is essential to this discussion.

Cheers,

Mark

Mark Hawkes
E-Learning and ADST Coordinator
Learning Division
Ministry of Education

Seward, Myrna EDUC:EX

From: Hawkes, Mark EDUC:EX
Sent: Tuesday, August 25, 2015 9:50 AM
To: 'anita chapman'
Subject: FW: coding

Importance: High

Hi, Anita:

Bringing you into the latest conversation about coding (see below). s.13
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s.13

Here are the relevant points from the Digital Literacy Characteristics:

6. Technology Operations and Concepts

Students demonstrate a sound understanding of technology concepts, systems, and operations, and develop computational thinking skills.

a. General Knowledge And Functional Skills

➢ *A digitally literate person knows the basics (terminology, navigation, functionality) of digital devices and can use them for basic purposes.*

The student:

- understands that computer programs are sets of instructions that tell computers what to do. (Gr. K-2)
- can use a digital device, which may be one of many types (e.g. Desktop PC, Laptop, Tablet, Smartphone). (Gr. K-2)
- understands the difference between hardware and software and how they work together. (Gr. 3-5)
- can design, write, and debug simple computer programs (e.g. Scratch). (Gr. 3-5)
- understands the different parts and components of a computer and/or other digital devices (Gr. 3-5)
- possesses general computer skills (typing, using computers, launching a new program). (Gr. 3-5)
- **Can solve problems by decomposing them into smaller parts.** (Gr. 6-9)
- knows about the existence of various operating systems and understands the differences between them. (Gr. 6-9)
- can design, write and debug programs that accomplish specific goals, such as controlling or simulating physical systems. (Gr. 6-9)
- can solve programming problems by decomposing them into smaller parts. (Gr. 6-9)
- uses a variety of programming languages to create programs, apps, games, or other software tools. (Gr. 10-12)

- is familiar with the meaning of terms commonly used in user manuals for the operation of hardware and the installation and configuration of software. (Gr. 10-12)
- troubleshoots systems and applications. (Gr. 10-12)

s.13

From: Walt, Nancy J EDUC:EX
Sent: Monday, August 24, 2015 11:52 AM
To: Winkelmans, Tim EDUC:EX
Cc: Hawkes, Mark EDUC:EX; Munro, Brent D EDUC:EX
Subject: RE: coding

s.13

From: Winkelmans, Tim EDUC:EX
Sent: Monday, August 24, 2015 11:45 AM
To: McCrea, Jennifer EDUC:EX; Walt, Nancy J EDUC:EX; Munro, Brent D EDUC:EX
Cc: Walker, Kim EDUC:EX; MacBeth, Sherry L EDUC:EX; Hawkes, Mark EDUC:EX; Stanners, Garrett EDUC:EX
Subject: RE: coding
Importance: High

Hi, Jenn

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From: McCrea, Jennifer EDUC:EX
Sent: Monday, August 24, 2015 11:35 AM
To: Winkelmans, Tim EDUC:EX
Cc: Walker, Kim EDUC:EX; MacBeth, Sherry L EDUC:EX
Subject: coding

Hi again,
The DM said he would like to give the minister a full briefing on Coding next Monday (Aug. 31) during Minister's council. Here is what he would like me to cover:

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Thx much.

Jennifer McCrea
A/ADM
Learning Division, Ministry of Education
250-896-3735

CODE CREATE EVENT REPORT

[1] All responses are recorded in this report under APPENDIX 1 and APPENDIX 2. All of the curated responses were generated anonymously and are being treated as such for the purposes of this report. When referring to APPENDIX 1 and APPENDIX 2 please note that some children reported their ages which are italicized after their comment.

BRITISH COLUMBIA

NEWS RELEASE

For Immediate Release
2015PREM0026-000573
April 28, 2015

Office of the Premier
Ministry of Advanced Education

Premier Christy Clark announces funding to support home-grown tech talent

KELOWNA – Targeted funding of $250,000 was announced today by Premier Christy Clark to help students at five public post-secondary institutions in Kelowna, Victoria and Vancouver develop coding-related skills for occupations that are in demand by the tech sector.

"British Columbia is home to a growing tech sector that generates about $23 billion in annual revenue and employs around 84,000 people," said Premier Clark, who made the announcement at Hyper Hippo Games in Kelowna. "Aligning coding skills needed by local tech businesses with post-secondary courses will keep this sector growing, and create more career paths for students who want to stay in B.C."

Coding is what makes it possible for people to create computer software, apps and websites.

Five public post-secondary institutions will each receive targeted one-time funding of $50,000 to pilot short-term coding training tailored to meet local industry needs and job openings. The five institutions are: British Columbia Institute of Technology, Okanagan College, Simon Fraser University, the University of British Columbia and the University of Victoria.

"The tech sector told us of their talent shortage – and our government has listened," said Advanced Education Minister Andrew Wilkinson. "This pilot will use post-secondary training funds to support job creation and growth as we grow our diverse, modern economy."

"Technology has been the second-fastest private-sector job creator over the past decade," said Amrik Virk, Minister of Technology, Innovation and Citizens' Services. "What better way to continue on building that strength than by focusing on B.C.'s youth, the future and the backbone to this industry?"

The pilot project supports B.C.'s Skills for Jobs Blueprint which was launched in April 2014 as it aligns funding for post-secondary education and training with in-demand occupations.

"The tech sector has sent a loud and clear message that there are job opportunities locally, nationally and internationally," said Okanagan College president Jim Hamilton. "With the right training, hands-on experience, and industry contacts, thriving careers are easily within grasp for students from Okanagan College."

"Succeeding in our industry is very, very hard. Our international success is completely because of the super-awesome Kelowna team," said Hyper Hippo Games CEO Lance Priebe. "We see the opportunity to make Kelowna the leader in digital entertainment. As a growing tech company, Hyper Hippo is thrilled to see this help today in growing talent in our own backyard."

To ensure a strong match with job openings in local industry, public post-secondary institutions

are being asked to work closely with the British Columbia Innovation Council and its Acceleration Network to determine the focus of the coding-related courses.

"We have seen growth and demand for local talent," said Accelerate Okanagan CEO Pilar Portela. "Partnerships with post-secondary institutions such as Okanagan College are important because connecting industry needs with what is being taught in the classroom helps develop local, high-skilled, high-tech talent."

The BC Innovation Council supports new start-ups and entrepreneurs. The BC Venture Acceleration Program helps early stage technology entrepreneurs in British Columbia to commercialize their innovation.

A labour-market outlook study released on March 12, 2015, by the Information and Communications Technology Council projected an estimated demand of more than 182,000 new people to fill jobs across Canada.

Computer programmers and Interactive Media Developers are among the top 60 occupations in the British Columbia 2022 Labour Market Outlook.

Media Contacts:

Sam Oliphant
Press Secretary
Office of the Premier
250 952-7252

Stacey McGaghey Jones
Communications Manager
Ministry of Advanced Education
250 952-6400

Christine Ulmer
Manager, Marketing and Communications
Okanagan College
250 470-3633

Seward, Myrna EDUC:EX

From:	Anita Chapman <anitachapman@shaw.ca>
Sent:	Tuesday, August 25, 2015 10:33 AM
To:	Hawkes, Mark EDUC:EX
Cc:	Walt, Nancy J EDUC:EX
Subject:	Re: coding
Attachments:	6-7 content - Mike & Jon (v2).docx; ATT00001.htm; 8 content - Mike & Jon (v2).docx; ATT00002.htm; Digitial Literacy from MOE.docx; ATT00003.htm
Importance:	High

More…

Fortunately, I think the ADST team has this well in hand for the purposes of you having to dash off a one pager.

Jon and Mike are developing three modules for grades 6-9:
- Digitial Literacy (might be better to call it Digital Citizenship)
- Computational Thinking (intended as as a direct percursor to Coding in high grades)
- Computers and Communications Devices

At the grade 6/7 level, this represents three brand new curricula where there is currently no curriculum, and at grade 8 and 9, this represents an updated and much expanded curriculum compared to the current Info Tech curriculum.

This is their rough work for all three options at 6/7 and part of 8; they didn't get to 9 at the last meeting.

Seward, Myrna EDUC:EX

From: Anita Chapman <anitachapman@shaw.ca>
Sent: Tuesday, August 25, 2015 10:20 AM
To: Hawkes, Mark EDUC:EX
Subject: Re: coding
Attachments: Digitial Literacy from MOE.docx; ATT00001.htm

Importance: High

Hi Mark,

I cannot do a conference call as I am doing presentations every day this week, then flying to Toronto on the weekend to work there for 10 days. But I don't think we have any sort of problem here that needs action before the September meeting. If you are getting questions, pressure about this, I think reporting on the work to date will put people at ease:

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August 2015 Technology Strategy and Coding – Information note

Current Status in Schools:

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Two years ago, the Ministry released a **Digital Literacy Framework**: a set of guidelines for teachers to support the interest, attitude and ability of learners to appropriately use digital technology and communication tools.

Topics include:

- Research and Information Literacy;
- Creativity and Innovation;
- Critical Thinking, Problem Solving, and Decision Making;
- Digital Citizenship;
- Communication and Collaboration;
- Technology Operations and Concepts.

Each topic has learning outcome descriptors of what students should be able to demonstrate at different ages. **Technology Operations and Concepts** addresses coding-related outcomes for students.

There are many coding resources that are available to students free of cost. i.e. Khan Academy instructional videos. Various non-profit organizations also put on coding events periodically throughout the year.

New curriculum

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The Techology and Innovation Strategy

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- Funded Initiatives

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- Unfunded Initiatives

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Where we want to be in the next 1-3 years

After and evaluation of the pilot year, if funding is available, successful aspects of the BC Youth Coding Initiative will be scaled up to increase the reach and penetration of the various strategies and events.

Students:

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Teachers:

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Expected outcomes:

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PROVINCE OF BRITISH COLUMBIA
MINISTRY OF EDUCATION

TRANSFER UNDER AGREEMENT

THIS AGREEMENT dated for reference the 16th day of October, 2015.

BETWEEN:

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA, represented by the Minister of Education

(the "Province", "we", "us" or "our", as applicable)

OF THE FIRST PART

AND:

British Columbia Teachers' Federation
550 W 6th Ave #100,
Vancouver, BC V5Z 4P2
(the "Recipient", "you" or "your" as applicable)

OF THE SECOND PART

The parties to this Agreement agree as follows:

SECTION 1 - APPOINTMENT

1.01 The Province retains the Recipient to provide the services (the "Services") during the term (the "Term"), both described in Schedule "A".

SECTION 2 - PAYMENT OF A FINANCIAL CONTRIBUTION

2.01 Subject to the provisions of this Agreement, the Province will provide the Recipient with a financial contribution (the "Financial Contribution"), in the amount and manner, and at the times set out in Schedule "B" attached to this Agreement.

2.02 Notwithstanding any other provision of this Agreement the payment of the Financial Contribution" by the Province to the Recipient pursuant to this Agreement is subject to:

(a) there being sufficient monies available in an appropriation, as defined in the *Financial Administration Act* ("FAA"), to enable the Province, in any fiscal year when any payment of money by the Province to the Recipient falls due pursuant to this Agreement, to make that payment; and

(b) Treasury Board, as defined in the FAA, not having controlled or limited, pursuant to the FAA, expenditure under any appropriation referred to in subparagraph (a) of this paragraph.

2.03 The Recipient must:

(a) apply for any refund or remission of federal or provincial tax or duty available with respect to any items that the Province has paid for or agreed to pay for under this Agreement (the "Refund"), and

(b) on receipt of the Refund, comply with the requirements concerning the use, application or remittance of the Refund set out in Schedule "B" to this Agreement.

2.04 Paragraph 2.03 continues in force indefinitely, even after this Agreement expires or is terminated.

SECTION 3 - REPRESENTATIONS AND WARRANTIES

3.01. The Recipient represents and warrants to the Province with the intent that the Province will rely thereon in entering into this Agreement that:

(a) all information, statements, documents and reports furnished or submitted by it to the Province in connection with this Agreement are true and correct;
(b) it has no knowledge of any fact that materially adversely affects, or so far as it can foresee, might materially adversely affect, its properties, assets, condition (financial or otherwise), business or operations or its ability to fulfill its obligations under this Agreement;
(c) it is not in breach of, or in default under, any law, statute or regulation of Canada or of the Province of British Columbia applicable to or binding on it or its operations;

3.02 All statements contained in any certificate, application, proposal or other document delivered by or on behalf of the Recipient to the Province under this Agreement or in connection with any of the transactions contemplated hereby will be deemed to be representations and warranties by the Recipient under this Agreement.

3.03 All representations, warranties, covenants and Agreements made herein and all certificates, applications or other documents delivered by or on behalf of the Recipient are material and will have been relied upon by the Province and will continue in full force and effect during the continuation of this Agreement.

SECTION 4 - RELATIONSHIP

4.01 No partnership, joint venture, agency or other legal entity will be created by or will be deemed to be created by this Agreement or any actions of the parties pursuant to this Agreement.

4.02 The Recipient will be an independent contractor and not the servant, employee or agent of the Province.

4.03 The Recipient will not in any manner whatsoever commit or purport to commit the Province to the payment of money to any person, firm or corporation.

4.04 The Province may, from time to time, give instructions to the Recipient in relation to the carrying out of the Services, and the Recipient will comply with those instructions but will not be subject to the control of the Province regarding the manner in which those instructions are carried out except as specified in this Agreement.

SECTION 5 - RECIPIENT'S OBLIGATIONS

5.01 The Recipient, through its agent, the Computer Using Educators of BC Provincial Specialist Association (PSA) will:

(a) carry out the Services in accordance with the terms of this Agreement during the Term stated in Schedule "A" of this Agreement;
(b) comply with the payment requirements set out in Schedule "B", including all requirements concerning the use, application and expenditure of the Financial Contribution provided under this Agreement;
(c) comply with all applicable laws;
(d) hire and retain only qualified staff;
(e) without limiting the provisions of subparagraph (c) of paragraph 5.01, carry out criminal record checks as required by the *Criminal Records Review Act*, in accordance with Schedule "D", if attached to this Agreement; and
(f) Unless agreed otherwise supply, at its own cost, all labour, materials and approvals necessary to carry out the Services.
(g) co-operate with the Province in making such public announcements regarding the Services and the details of this Agreement as the Province requests; and
(h) acknowledge the financial contribution made by the Province to the Recipient for the Services in any Materials, by printing on each of the Materials the following statement:
"We gratefully acknowledge the financial support of the Province of British Columbia through the Ministry of Education."

SECTION 6 - RECORDS

6.01 The Recipient will:

(a) establish and maintain accounting and administrative records in form and content satisfactory of the Province, to be used as the basis for the calculation of the Financial Contribution;

(b) establish and maintain books of account, invoices, receipts and vouchers for all expenses incurred in form and content satisfactory to the province; and

(c) permit the Province at any time or times during normal business hours, to copy or audit, or both, any or all of the books of account and records (including original supporting documents) referred to in sub-paragraphs (a) and (b) of this paragraph.

6.02 The Recipient will not, without the express written consent of the Province, dispose of any time records, books of account, invoices, receipts or vouchers relevant to this Agreement.

SECTION 7 - STATEMENTS AND ACCOUNTING

7.01 Within 3 months of being requested to do so by the Province, the Recipient will:

(a) provide to the Province a statement documenting the expenditure of the Financial Contribution under this Agreement in form and content satisfactory to the Province.

7.02 At the sole option of the Province, any portion of the Financial Contribution provided to the Recipient under this Agreement and not expended at the end of the Term shall be:

(a) returned by the Recipient to the Minister of Finance;

(b) retained by the Recipient as supplemental funding provided for under an amendment to this Agreement; or

(c) deducted by the Province from any future funding requests submitted by the Recipient and approved by the Province.

SECTION 8 - REPORTS

8.01 Upon the Province's request, the Recipient will:

(a) in a timely manner, fully inform the Province of the work completed and remaining to be done by the Recipient under this Agreement, and

(b) permit the Province at all reasonable times to inspect, audit, examine, review and copy any findings, data, specifications, drawings, working papers, reports, surveys, spread sheets, evaluations, documents, databases and material, (both printed and electronic, including, but not limited to, hard disk or diskettes), whether complete or not, that is produced or otherwise acquired by the Recipient as a result of this Agreement (collectively, the "Material").

SECTION 9 - CONFLICT OF INTEREST

9.01 The Recipient will not, during the Term, perform a service for or provide advice to any person, or entity where the performance of such service or the provision of the advice may, in the reasonable opinion of the Province, give rise to a conflict of interest between the obligations of the Recipient to the Province under this Agreement and the obligations of the Recipient to such other person, or entity.

SECTION 10 - CONFIDENTIALITY

10.01 The Recipient will treat as confidential all information or material supplied to or obtained by the Recipient, or any sub-contractor, as a result of this Agreement and will not, without the prior written consent of the Province, except as required by applicable law including *the Freedom of Information and Protection of Privacy Act*, permit its disclosure except to the extent that such disclosure is necessary to enable the Recipient to fulfill its obligations under this Agreement.

SECTION 11 - DEFAULT

11.01 Any of the following events will constitute an Event of Default, namely:

(a) the Recipient fails to comply with any provision of this Agreement;
(b) any representation or warranty made by the Recipient in accepting this Agreement is untrue or incorrect;
(c) any information, statement, certificate, report or other document furnished or submitted by or on behalf of the Recipient pursuant to or as a result of this Agreement is untrue or incorrect;
(d) the Recipient ceases, in the opinion of the Province, to operate;
(e) a change occurs with respect to any one or more, including all, of the properties, assets, condition (financial or otherwise), business or operations of the Recipient which, in the opinion of the Province, materially adversely affects the ability of the Recipient to fulfill its obligations under this Agreement;
(f) an order is made or a resolution is passed or a petition is filed for the liquidation or winding up of the Recipient;
(g) the Recipient becomes insolvent or commits an act of bankruptcy or makes an assignment for the benefit of its creditors or otherwise acknowledges its insolvency;
(h) a bankruptcy petition is filed or presented against, or a proposal under *the Bankruptcy and Insolvency Act* (Canada) is made by, the Recipient;
(i) a receiver or receiver-manager of any property of the Recipient is appointed; or
(j) the Recipient permits any sum which is not disputed to be due by it to remain unpaid after legal proceedings have been commenced to enforce payment thereof.

SECTION 12 - TERMINATION

12.01 Upon the occurrence of any Event of Default and at any time thereafter the Province may, notwithstanding any other provision of this Agreement, at its option, elect to do any one or more of the following:

(a) terminate this Agreement, in which case the payment of the amount required under paragraph 12.03 of this Agreement will discharge the Province of all liability to the Recipient under this Agreement;

(b) require the Event of Default be remedied within a time period specified by the Province;

(c) suspend any installment of the Financial Contribution or any amount that is due to the Recipient while the Event of Default continues;.

(d) waive the Event of Default;

(e) pursue any other remedy available at law or in equity.

12.02 The Province may also, at its option, either:

(a) terminate this Agreement on 30 days' written notice, or

(b) terminate this Agreement immediately if the Province determines that the Recipient's failure to comply places the health or safety of any person receiving the Services at immediate risk,

and in either case, the payment of the amount required under paragraph 12.03 of this Agreement will discharge the Province of all liability to the Recipient under this Agreement.

12.03 Where this Agreement is terminated before 100% completion of the Services, the Province will pay to the Recipient that portion of the Financial Contribution which is equal to the portion of the Services completed to the satisfaction of the Province prior to termination.

SECTION 13 - DISPUTE RESOLUTION

13.01 All disputes arising out of or in connection with this Agreement will be referred to and finally resolved by arbitration pursuant to the *Commercial Arbitration Act*.

SECTION 14 - INSURANCE AND INDEMNITY

14.01 During the Term of this Agreement, the Recipient will provide, maintain and pay for insurance as specified in Schedule "C", if any, which may be amended from time to time at the sole discretion of the Province.

14.02 Without limiting the provisions of subparagraph (c) of paragraph 5.01, the Recipient will comply with the Workers' Compensation Legislation for the Province of British Columbia.

14.03 The Recipient will indemnify and save harmless the Province, its employees and agents, from and against any and all losses, claims, damages, actions, causes of action, costs and expenses that the Province may sustain, incur, suffer or put to at any time either before or after the expiration or termination of this Agreement, where the same or any of them are based upon, arise out of or occur, directly or indirectly, by reason of any act or omission of the Recipient, or of any agent, employee, officer, director or sub-contractor of the Recipient pursuant to this Agreement, excepting always liability arising out of the independent negligent acts of the Province.

SECTION 15 - ASSIGNMENT AND SUB-CONTRACTING

15.01 The Recipient will not, without the prior, written consent of the Province:

(a) assign, either directly or indirectly, this Agreement or any right of the Recipient under this Agreement; or

(b) sub-contract any obligation of the Recipient under this Agreement.

15.02 No sub-contract entered into by the Recipient will relieve the Recipient from any of its obligations under this Agreement or impose upon the Province any obligation or liability arising from any such sub-contract.

15.03 This Agreement will be binding upon the Province and its assigns and the Recipient, the Recipient's successors and permitted assigns.

SECTION 16 - OWNERSHIP AND COPYRIGHT

16.01 Copyright in the Material will be the exclusive property of the Province and, at the request of the Province, the Recipient will provide documents confirming the vesting of copyright in the Province.

16.02 The Recipient acknowledges and agrees that the Province exclusively owns:

(a) all documents received by the Recipient from the Province as a result of this Agreement, including findings, software, data, specifications, drawings, reports, and documents, and

(b) any property that is provided by the Province to the Recipient for the purposes of this Agreement, unless the Province has indicated in writing that the property provided is to be owned by the Recipient.

(the documents and property referred to in subparagraphs (a) and (b) collectively referred to as the "Province's Property").

16.03 The Recipient will deliver the Material and the Province's Property forthwith following the expiration or sooner termination of this Agreement; provided that the Province may, at any time or times prior to the expiration or sooner termination of this Agreement, give written notice to the Recipient requesting delivery by the Recipient to the Province of any or all of the Material and Province's Property, in which event the Recipient will forthwith comply with that request.

16.04 If the Recipient is a person, or a sole proprietorship, the Recipient warrants that the Recipient is the only person who has or will have moral rights in the Material and the Recipient hereby waives in favour of the Province all of the Recipient's moral rights, as provided for in the law of copyright, in the Material produced by the Recipient, and upon that Material coming into existence, the Recipient agrees to execute documents provided by the Province acknowledging the waiver of the Recipient's moral rights in such Material.

16.05 If the Recipient is a corporation, professional association. or joint venture, the Recipient will cause any of its employees, sub-contractors, partners, or members as the case may be, who have moral rights in the Material to execute a waiver of moral rights on any form of waiver provided by the Province, and to forward the waiver to the Province.

SECTION 17 - OTHER FUNDING

17.01 If the Recipient receives funding for or in respect of the Services from any person, firm, corporation or other government or governmental body, then the Recipient will immediately provide the Province with full and complete details thereof.

SECTION 18 - NOTICES

18.01 Any written communication from the Recipient to the Province must be mailed, personally delivered or faxed to the following address:

Ministry of Education
PO Box 9887 Stn Prov Govt
Victoria, BC V8W 9T6
Attention: Mark Hawkes

18.02 Any written communication from the Province to the Recipient must be mailed, personally delivered, or faxed to the following address:

BC Teachers' Federation
550 W 6th Ave #100
Vancouver, BC V5Z 4P2
Attention: Dan Johnston

18.03 Any written communication from either party will be deemed to have been received by the other party on the third business day after mailing in British Columbia; on the date of personal delivery if personally delivered; or on the date of transmission if faxed;

18.04 Either party may, from time to time, notify the other party in writing of a change of address and, following the receipt of such notice, the new address will, for the purposes of paragraph 18.01 or 18.02 of this Agreement, be deemed to be the mailing address of the party giving notice.

SECTION 19 - NON-WAIVER

19.01 No term or condition of this Agreement and no breach by the Recipient of any such term or condition will be deemed to have been waived unless such waiver is in writing signed by the Province and the Recipient.

19.02 The written waiver by the Province or any breach by the Recipient of any term or condition of this Agreement will not be deemed to be a waiver of any other provision of any subsequent breach of the same or any other provision of this Agreement.

SECTION 20 - ENTIRE AGREEMENT

20.01 This Agreement constitutes the entire Agreement between the parties with respect to the subject matter of this Agreement.

SECTION 21 - SURVIVAL OF PROVISIONS

21.01 All of the provisions of this Agreement in favour of the Province including, without limitation, paragraphs 2.02, 4.03, 6.01, 7.02, 8.01, 10.01, 12.03, 14.03, 16.01 to 16.05, 18.01 to 18.04 and all of the rights and remedies of the Province, either at law or in equity, will survive any expiration or sooner termination of this Agreement.

SECTION 22 - MISCELLANEOUS

22.01 This Agreement will be governed by and construed in accordance with the laws of the Province of British Columbia.

22.02 The Schedules to this Agreement are an integral part of this Agreement as if set out at length in the body of this Agreement.

22.03 No amendment or modification to this Agreement will be effective unless it is in writing and duly executed by the parties.

22.04 If any provision of this Agreement or the application to any person or circumstance is invalid or unenforceable to any extent, the remainder of this Agreement and the application of such provision to any other person or circumstance will not be affected or impaired thereby and will be enforceable to the extent permitted by law.

22.05 Nothing in this Agreement operates as a consent, permit, approval or authorization by the Government of the Province of British Columbia or any Ministry or Branch thereof to or for anything related to the Services that by statute, the Recipient is required to obtain unless it is expressly stated herein to be such a consent, permit, approval or authorization.

22.06 Where the Recipient is a corporation, the Recipient warrants that the signatory has been duly authorized by the Recipient to execute this Agreement without corporate seal on behalf of the Recipient.

22.07 This Agreement may be executed by the parties in separate counterparts each of which when so executed and delivered shall be an original, and all such counterparts may be delivered by facsimile transmission and such transmission shall be considered an original.

22.08 For the purpose of paragraphs 22.09 and 22.10, an "Event of Force Majeure" includes, but is not limited to, acts of God, changes in the laws of Canada, governmental restrictions or control on imports, exports or foreign exchange, wars (declared or undeclared), fires, floods, storms, strikes (including illegal work stoppages or slowdowns), lockouts, labour shortages, freight embargoes and power failures or other cause beyond the reasonable control of a Party, provided always that lack of money, financing or credit will not be and will not be deemed to be an "Event of Force Majeure".

22.09 Neither party will be liable to the other for any delay, interruption or failure in the performance of their respective obligations if caused by an Event of Force Majeure, in which case the time period for the performance or completion of any such obligation will be automatically extended for the duration of the Event of Force Majeure.

22.10 If an Event of Force Majeure occurs or is likely to occur, then the party directly affected will notify the other Party forthwith, and will use its reasonable efforts to remove, curtail or contain the cause of the delay, interruption or failure and to resume with the least possible delay compliance with its obligations under this Agreement.

The parties hereto have executed this Agreement the day and year as set out above.

SIGNED AND DELIVERED by the Recipient or an Authorized Representative of the Recipient.	**SIGNED AND DELIVERED** on behalf of the Province by an Authorized Representative of the Province.
_____	Tim Winkelmans
(Print Name of Recipient or Authorized Representative)	(Print Name of Authorized Representative)
_____	_____
(Signature)	(Signature)

SCHEDULE 'A' – SERVICES

The Term of this Agreement is October 16, 2015 to June 30, 2016.

Background
The Province and the Recipient have a vested and continuing interest in supporting the public education system in British Columbia and in working cooperatively toward this objective.

The Computer Using Educators of BC (CUEBC) is an organization of BC educators dedicated to promoting the educational uses of technology in the classroom, one of 32 Provincial Specialist Associations (PSAs) under the Recipient. The PSAs are channels for educators and other members to exchange ideas on research, teaching strategies, curriculum development, and other shared interests.

Services
The Recipient will provide the following Services:

1) Financial administration of three (3) ***Hour of Code*** half-day events in Vancouver , Victoria, and Prince George between December 7 and 13, 2015, and one (1) ***Maker Day*** event in Kelowna in January, 2016. The Recipient will work collaboratively with Project partners: the Ministry of Education, Melody Ma, BC Coding Initiative Coordinator (volunteer), Industry hosts, post-secondary institutions (Faculties of Computer Science and Education), and local school districts to provide these events. On or before January 31st, 2016, the Recipient will submit a brief report summarizing the outcome of each of the four events, including participation rate and an anecdotal evaluation of participants' and partners' perceptions of the events.

2) On or before March 14th, 2015: the creation of a first version of an online ***Teachers Guide to Coding***. The Guide will be a living document (website) that can be continuously updated and maintained to connect teachers to pedagogical frameworks for coding initiatives and then to an assortment of existing age / grade-appropriate resources to use. The site will facilitate 2-way communication between teachers to review and comment on resources, similar to a Yelp for age-appropriate coding resources, specifically linked to the new K-9 Applied Design, Skills, and Technologies (ADST) curriculum. The Guide will help teachers integrate coding experiences for students into the new curriculum, and assist teachers with the implementation of the ADST curriculum.

3) On or before June 30th, 2015: the creation of a final version of an online ***Teachers Guide to Coding***. The finished Guide will include any Ministry-requested changes to the first version. The cost of making these changes may not exceed the value of the two payments for the Guide.

4) Ensure CUEBC establishes and maintains financial controls, event planning and project data reports, accounting processes, and administrative records to be used as the basis for the management of the Financial Contribution, as per the Recipient's policies and procedures and the '*PSA Guidebook*, February 2012'.

The Province's representative under this Agreement is Mark Hawkes, telephone (250) 217-5567. The Recipient's representative under this Agreement is _____.

SCHEDULE 'B' – FINANCIAL CONTRIBUTION

1. The Province agrees to provide a Financial Contribution to the Recipient in the amount of up to $33,500 for the provision of the Services during the Term of the Agreement, both described in Schedule "A".

2. Payments will be made as follows:

   (a) an initial payment of $6,500.00 to help with printing and distribution start-up costs within 30 days of signing of this Agreement;

   (b) upon receipt and approval by the Province of the ***Hour of Code/Maker Day*** events summary report as set out in Section 1 of Schedule "A", initiation of a payment amount of $10,000.00;

   (c) upon receipt and approval by the Province of the first version of the ***Teachers Guide to Coding*** as set out in Section 2 of Schedule "A", initiation of a payment amount of $10,000.00;

   (d) on completion of Services and upon receipt and approval by the Province of the final version of the ***Teachers Guide to Coding***, as set out in Section 3 of Schedule "A", initiation of a final payment not to exceed $7,000.00.

3. The Recipient will submit to the Province, upon completion of the Services specified in Schedule "A", a full accounting of the receipt and expenditure of the Financial Contribution.

4. The actual amount of the final payment referred to in subparagraph 2(d) will be determined by the Province based upon the financial information contained in the financial reconciliation report referred to in paragraph 3.

ADST 10-12 Curricula

Criteria:

s.13

	Current Applied Skills 10-12 curricula in IRPs (i.e., does not include BAA or industry developed curricula)	Proposed ADST10-12 curricula (Updated proposal from February 15, 2015 team meeting)	Notes (from meeting with Ministry staff on Feb 12, 2016 and subsequent conversations with ADST sub-teams)
	Applied Skills 11	s.13	
	Skills Exploration 10		
	Skills Exploration 11		
	Skills Exploration 12		
Business Education	Business Education 10: General		
	Business Education 10: Communication		
	Business Education 10: Entrepreneurship		
	Business Education 10: Finance and Economics		
	Business Education 10: Marketing		

		s.13
	Accounting 11	
	Basic Computer Applications 11	
	Marketing 11	
	Accounting 12	
	Business Information Management 12	
	Data Management 12	
	Economics 12	
	Financial Accounting 12	
	Management Innovation 12	
	Marketing 12	
Home Economics	Home Economics 10: General	
	Home Economics 10: Foods and Nutrition	
	Home Economics 10: Textiles	
	Home Economics 10:Family Studies	
	Food Studies 11	
	Textile Studies 11	
	Family Studies 11	
	Cafeteria Training 11	
	Food Studies 12	
	Textile Studies 12	
	Family Studies 12	
	Cafeteria Training 12	

s.13

Information Technology	Information Technology 10
	Information and Communications Technology: Applied Digital Communications 11
	Information and Communications Technology: Computer Information Systems 11
	Information and Communications Technology: Computer Programming 11
	Information and Communications Technology: Digital Media Development 11
	Information and Communications Technology: Applied Digital Communications 12
	Information and Communications Technology: Computer Information Systems 12
	Information and Communications Technology: Computer Programming 12
	Information and Communications Technology: Digital Media Development 12
Media	Visual Arts: Media Arts 10[1]

s.13

	Visual Arts: Media Arts 11
	Visual Arts: Media Arts 12
Technology Education	Technology Education 10: General
	Technology Education 10: Drafting and Design
	Technology Education 10: Electronics
	Technology Education 10: Mechanics
	Technology Education 10: Metalwork
	Technology Education 10: Woodwork
	Automotive Technology 11
	Carpentry and Joinery 11
	Drafting and Design 11
	Electronics 11
	Metal Fabrication and Machining 11
	Automotive Technology 12
	Automotive Technology 12: Automotive Electricity and Electronics
	Automotive Technology 12: Body Repair and Finish
	Automotive Technology 12: Engine and Drive Train
	Carpentry and Joinery 12
	Carpentry and Joinery 12: Cabinet Construction
	Carpentry and Joinery 12: CNC Wood Processes
	Carpentry and Joinery 12: Residential Construction
	Carpentry and Joinery 12: Woodcraft

Seward, Myrna EDUC:EX

From: Ritchie, Norma J EDUC:EX
Sent: Wednesday, March 30, 2016 9:11 AM
To: Seward, Myrna EDUC:EX
Subject: FOI re computer coding FW: curriculum item for MC on Monday [Minister's Council - Monday August 31st]
Attachments: Curriculum Update.docx

From: Ritchie, Norma J EDUC:EX
Sent: August 27 2015 2:58 PM
To: Walker, Kim EDUC:EX; Hicks, Rob EDUC:EX
Subject: FW: curriculum item for MC on Monday [Minister's Council - Monday August 31st]

FYI. . .

From: Winkelmans, Tim EDUC:EX
Sent: August 27 2015 2:42 PM
To: McLaughlin, Katie EDUC:EX; Walt, Nancy J EDUC:EX
Cc: McCrea, Jennifer EDUC:EX; Ritchie, Norma J EDUC:EX
Subject: curriculum item for MC on Monday [Minister's Council - Monday August 31st

Attached, approved

From: McLaughlin, Katie EDUC:EX
Sent: Thursday, August 27, 2015 10:15 AM
To: Walt, Nancy J EDUC:EX; Winkelmans, Tim EDUC:EX; Cadwallader, Ted EDUC:EX
Cc: McCrea, Jennifer EDUC:EX; Ritchie, Norma J EDUC:EX
Subject: MATERIALS NEEDED: Minister's Council - Monday August 31st
Importance: High

Hi Nancy and Tim,

We have both of your areas on the agenda for Minister's Council on Monday. **Tim**, the Coding for Schools topic will be added to the agenda, as per the DM's request earlier in the week. **Nancy**, Jennifer will be addressing the roll-out strategy for curriculum.

Can you please ensure appropriate materials are approved by Ted (Acting in Jennifer's absence) prior to sending them to the DMO?

To keep things organized, as we have many people away today, can you please send final materials to me by 4:00 p.m. this afternoon so I can send them up to Devon and Courtney before their end of day deadline?

Many thanks.

Katie McLaughlin | Manager, Strategic Projects
Ministry of Education | Learning Division

From: McCrea, Jennifer EDUC:EX
Sent: Thursday, August 27, 2015 8:51 AM

To: McLaughlin, Katie EDUC:EX
Subject: Fwd: Minister's Council - Monday August 31st

Sorry to ask but can you help track this down with Kim being off?

Sent from My iPhone

Begin forwarded message:

> **From:** "McCrea, Jennifer EDUC:EX" <Jennifer.McCrea@gov.bc.ca>
> **Date:** August 27, 2015 at 8:49:19 AM PDT
> **To:** "Walker, Kim EDUC:EX" <Kim.Walker@gov.bc.ca>, "Cadwallader, Ted EDUC:EX" <Ted.Cadwallader@gov.bc.ca>
> **Subject: Fwd: Minister's Council - Monday August 31st**
>
> Hi both, I think we were suppose to have another item on here...evergreen? Do either of you remember? Ted I'm pretty sure it was your area...
>
> Sent from My iPhone
>
> Begin forwarded message:
>
> > **From:** "Shaw, Courtney EDUC:EX" <Courtney.Shaw@gov.bc.ca>
> > **Date:** August 27, 2015 at 8:44:22 AM PDT
> > **To:** "Rongve, Ian EDUC:EX" <Ian.Rongve@gov.bc.ca>, "McCrea, Jennifer EDUC:EX" <Jennifer.McCrea@gov.bc.ca>, "Cadwallader, Ted EDUC:EX" <Ted.Cadwallader@gov.bc.ca>, "MacFarlane, Paige EDUC:EX" <paige.macfarlane@gov.bc.ca>, "Fayad, Deborah EDUC:EX" <Deborah.Fayad@gov.bc.ca>, "Mason, Shanna EDUC:EX" <Shanna.Mason@gov.bc.ca>, "Mounteney, Renee EDUC:EX" <Renee.Mounteney@gov.bc.ca>, "Kot, Jill EDUC:EX" <Jill.Kot@gov.bc.ca>
> > **Cc:** "Carnegie, Lynn EDUC:EX" <Lynn.Carnegie@gov.bc.ca>, "Walker, Brenda MK EDUC:EX" <Brenda.Walker@gov.bc.ca>, "Bernard, Noreen C EDUC:EX" <Noreen.Bernard@gov.bc.ca>, "Paulson, Aleesa EDUC:EX" <Aleesa.Paulson@gov.bc.ca>, "Phillips, Devon EDUC:EX" <Devon.Phillips@gov.bc.ca>, "Patterson, Catherine M EDUC:EX" <Catherine.Patterson@gov.bc.ca>, "Moir, Lindsay EDUC:EX" <Lindsay.Moir@gov.bc.ca>, "Walker, Kim EDUC:EX" <Kim.Walker@gov.bc.ca>, "MacBeth, Sherry L EDUC:EX" <Sherry.MacBeth@gov.bc.ca>, "Walt, Nancy J EDUC:EX" <Nancy.Walt@gov.bc.ca>, "Turner, Julie EDUC:EX" <Julie.Turner@gov.bc.ca>, "Wensley, Stacey EDUC:EX" <Stacey.Wensley@gov.bc.ca>
> > **Subject: Minister's Council - Monday August 31st**
> >
> > Good Morning All,
> >
> > Please find the Draft agenda for Monday's Minister's Council meeting, this meeting will be done by telepresence with the Minister and DM in Vancouver and everyone else in Victoria at 617 Government St.
> >
> > We will require all materials by end of day today, my apologies for the short notice on this, Devon will be sending out what we currently have for materials for these items to ensure they are correct and requesting the remaining materials still required.
> >
> > Please let me know if you have any questions or concerns.

Thank you kindly,
C.

Courtney Shaw, Senior Executive Assistant
Deputy Minister's Office ¦ Ministry of Education
PO Box 9179 STN PROV GOVT
Victoria, BC V8W 9H3
Phone: (250) 387-2026

Seward, Myrna EDUC:EX

From: Ritchie, Norma J EDUC:EX
Sent: Wednesday, March 30, 2016 9:14 AM
To: Seward, Myrna EDUC:EX
Subject: FOI re computer coding FW: Elisa Carlson FW: Technology and Innovation District Survey

---

From: Ritchie, Norma J EDUC:EX **On Behalf Of** EDUC Learning Division EDUC:EX
Sent: July 13 2015 11:27 AM
To: Winkelmans, Tim EDUC:EX; Stanners, Garrett EDUC:EX; Hawkes, Mark EDUC:EX
Subject: Elisa Carlson FW: Technology and Innovation District Survey

Forwarding response from Elisa Carlson. . . .
Norma

-----Original Message-----
From: Elisa Carlson [mailto:carlson_e@surreyschools.ca]
Sent: July 13 2015 9:56 AM
To: EDUC Learning Division EDUC:EX
Subject: FW: Technology and Innovation District Survey

Greetings Tim,

My apologies for the delayed response but I was out of the country and then on vacation.

I have checked with one of the Assistant Superintendent, Andrew Holland, as well as Susan Chow, the Principal of Career Programs and so far we are not aware of or know of any career activities in the context of supporting the Technology and Innovation sector, defined as Information and Communications Technology (ICT), Digital Media, Clean Technology, and Engineering.

The only thing they can think of that is remotely related might be The Career Ed Science Coop program. We have not completed the survey but have included the details below.

Science Coop programs are offered at the following secondary schools:
Earl Marriott (kids go to Bamfield Marine Science Centre for a few days) Elgin Park Fleetwood Park LA Matheson Panorama Ridge Princess Margaret QE

Info Tech Coop:
LA Matheson

I hope that provides you with some information.

Regards,

Elisa

Begin forwarded message:

From: "EDUC Learning Division EDUC:EX"
<EDUC.learningdivision@gov.bc.ca<mailto:EDUC.learningdivision@gov.bc.ca>>
Date: June 23, 2015 at 4:56:09 PM PDT
To: "'l_educ_superintendents@lists.gov.bc.ca<mailto:l_educ_superintendents@lists.gov.bc.ca>'"
<l_educ_superintendents@lists.gov.bc.ca<mailto:l_educ_superintendents@lists.gov.bc.ca>>
Subject: Technology and Innovation District Survey

The Ministry of Education is looking at career activities that support Technology and Innovation sector, defined as:

- Information and Communications Technology (ICT),
- Digital Media,
- Clean Technology, and
- Engineering.

To inform our planning during the summer, we are developing a profile of activities occurring in school districts - or in the planning stages for the 2015/2016 school year - to support student skills and career interest in Science, Technology, Engineering and Math (STEM) occupations in this sector.

The Ministry is particularly interested in programming and coding initiatives offered in collaboration with business or post-secondary partners.

Please find attached a survey form to provide us with the information we are looking for. We have kept it as short as possible, in consideration of the time of year. Accordingly, we will also be highly appreciative of any details you can provide.

If you have any questions about the attached survey, please contact Mark Hawkes (mark.hawkes@gov.bc.ca<mailto:mark.hawkes@gov.bc.ca>). Please send the completed survey to Garret Stanners (garret.stanners@gov.bc.ca<mailto:garret.stanners@gov.bc.ca>).

Sincerely

Tim Winkelmans
Director | Graduation, Skills, and Distance Learning | Learning Division Ministry of Education
250-217-6643

A stable, long-term supply of skilled talent for the technology sector starts with the creation of K-12 curricula building fundamental technical skills.

Q How have ICT and technical skills been integrated into the new curriculum?

A The ability to design and make, acquire skills as needed, and apply technologies is important in the world today and a key aspect of educating citizens for the future. The new and redesigned Applied Design, Skills, and Technologies (ADST) curriculum is an experiential, hands-on program of learning through design and creation that includes skills and concepts from traditional and Aboriginal practice; from the existing disciplines of Business Education, Home Economics, Information Technology, and Technology Education; and from new and emerging fields.

A ICT content standards for computational thinking, computing devices, and digital literacy for all students are specifically introduced at Grade 6/7 and continue through Grade 9/10. In Grades 11 and 12, as students begin to prepare for career transitions, ICT experiences will be elective options, as they are now.

Q What professional development or in-service training will be necessary for teachers to learn and teach these new skills?

A Boards, Authorities, Teachers' Associations and individual practitioners will help plan and implement the necessary professional development activities to meet the requirements of all new curricula. The Ministry of Education has dedicated 10 hours of in-service training to help school staff learn about curricular changes and the implementation of the new programs.

A The Ministry has funded the Computer Using Educators of British Columbia (CUEBC) to create an online coding resource guide for teachers by June 2016. CUEBC is a Provincial Specialist Association within the BCTF.

Q How will schools with small enrolments or with challenging technological tools be able to implement the new curriculum?

A Boards of Education and Independent School Authorities have the flexibility to assign resources to meet the needs of local projects. Some Boards and Authorities enable students to bring their own computers and devices to school, while others have purchased computers that can be centralized in a computer lab or classroom. Each jurisdiction decides what is best for its unique circumstance. As well, the Ministry of Education is upgrading the provincial Next Generation Network to improve internet access across the province.

A Some learners may decide to access online or distributed learning courses to supplement those available in their local schools.

A Schools also have the option of setting up Independent Directed Studies arrangements for students.

- Q What timelines are in place for the implementation of this curriculum?
  - A For K-9, the new ADST curriculum will be implemented in the 2016/17 school year.
  - A For 10-12, ADST will be implemented in the 2017/18 school year.

An area of study called Applied Design, Skills, and Technologies emphasizes familiarity with technology at early ages, and combines concepts from information technology, business, and technology education in later grades.

- Q How will we ensure young students balance the amount of screen time with the necessities of an active lifestyle?
  - A Not all technology lessons involve the use of computers and screens. Many logic lessons are taught with manipulative blocks and toys. Regardless, the new curricula do not advocate students spending large amounts of time in front of computers. Students learn in different ways, and will require flexible approaches to help each learner take full advantage of the lessons.
  - A For younger students, the new ADST curriculum is met through integrated and play-based activities with other subject areas, and involves processes that do not require screen time. Examples of these processes include coming up with ideas and designing solutions (at an age appropriate level).

- Q What hardware and infrastructure additions will be required for teachers, students and schools?
  - A Some schools may not require any additions, while others may require significant changes. Each Board and Authority will address local requirements and determine the best way to meet the changing needs of reformed curricula.
  - A Access to technology will benefit all areas of the new curriculum, not just ICT.
  - A Many of the resources used for coding are low cost or even free.

- Q How are new teachers being prepared for these changes? How are experienced teachers being brought onboard?
  - A Universities and colleges preparing new teachers are aware of the new curricula, and have been working to conform their programs to our reformed system. Experienced teachers will participate in a minimum of 10 hours of in-service training. Many professionals will also undertake development activities that further refine their skills using technology to enhance learning or to teach technological skills.
  - A The Ministry has funded the Computer Using Educators of British Columbia (CUEBC) to create an online coding resource guide for teachers by June 2016. CUEBC is a Provincial Specialist Association within the BCTF.

- Q What new resources will be introduced into our educational system to ensure all students have equity of access to these tools and methods?
  - A Boards of Education and Independent School Authorities have the flexibility to assign resources to meet the needs of local projects. Some Boards and Authorities enable

students to bring their own computers and devices to school, while others have purchased computers that can be centralized in a computer lab or classroom. Each jurisdiction decides what is best for its unique circumstance. As well, the Ministry of Education is upgrading the provincial Next Generation Network to improve internet access across the province.

A Additionally, we are supporting student opportunities to learn coding in and out of school through courses and special activities such as the Hour of Code.

A We know that many students already have their own technology that is more than capable of supporting the new curriculum requirements. Many schools have devices they can lend to students who otherwise cannot afford them.

A Schools can obtain free or low cost equipment through Computers for Schools.

Q Will all students be required to learn coding? Why is it important for students to learn to program?

A

A Computer code powers our digital world. Every website, smartphone app, computer program, calculator and even microwave relies on code in order to operate. Understanding this basic premise enables computer users to better understand and control technologies. As well, computers and technologies are being ubiquitously integrated into diverse jobs and careers. To better prepare our students for an ever-changing world, an understanding of coding will enable a higher level of literacy and logical approaches to problem solving.

Q I have ethical/moral/religious/cultural issues with technology – how do I opt-out my child?

A Discuss your concerns with your child's teacher or school administrator; not all of the concepts involved in understanding computers or computer coding require students to work with computers. Together, you can explore the range of possible alternatives available for your child.

Q What skills and credentials will my children learn/earn?

A Students participating in short, introductory Hour of Code activities may earn certificates or stickers indicating their participation. Students who undertake more intensive technology course work, such as Grade 10-12 computer programming courses, may earn high school credits. If your local school is a "Focus on Information Technology" member (http://www.focusit.ca/), students who successfully complete selected high school courses may also earn FIT certificates and industry-recognized credentials.

Q Will all students need to have access to a computer? My school only has one or two per classroom.

A Many activities that illustrate how computers and computer coding works do not require the use of computers. Many free puzzles, games and simulations can be used in classrooms to teach students the basic concepts.

- **A** Many students already have their own devices.
- **A** Schools can apply to Computers for Schools for appropriate equipment.

Q How will I help my child with homework – some of this coding will occur out of school?

- **A** Many schools will choose to conduct computer coding events outside of the school timetable. Students who choose to participate in these extra-curricular events will need to attend during evening or weekends. As well, many of these coding activities could be designed for parents as well as students. Talk with your child's teacher or school administrator to help put some of these activities in place.

We also intend to align our schools and the technology sector, so that students get the best guidance as they prepare to enter the knowledge economy.

Q Technology is a constantly changing field; how will the technology sector help students prepare for an uncertain future? Won't the industry have its own interests at heart?

- **A** Technology industries are looking to support creative individuals interested in pursuing careers in the high-tech sector. Each employer in the sector has different requirements, and if students are aware of the subtle differences, they can better target their career choices. As well, employers in the high-tech sector benefit from having a larger pool of talented individuals to recruit from.
- **A** Employers in the sector can offer Work Experience opportunities to high school students with appropriate preparation.
- **A** Some employers in the sector encourage their employees to volunteer as coding instructors or coaches.
- **A** Allowing students to develop an aptitude or passion in any area of endeavour is also in the students' best interests.

Q Does this imply that businesses will have a greater role in the operation of our schools?

- **A** No, but it is in the best interests of our learners for schools to create partnerships with employers. By enhancing the dialogue between learners and businesses, learners will be better able to formulate a plan for their future.

Q I live in a part of the province that relies on hunting, fishing, and logging. Why aren't these industries invited to be as closely aligned as the technology sector?

- **A** Many Boards of Education have designed locally developed, Board Authorized courses and programs that address the unique nature of their communities. Courses such as Forestry, Fish and Wildlife and Logging are currently being offered in many communities around the province. Check with your local school to determine what courses and programs might be available.
- **A** All industries are becoming increasingly reliant on ICT (examples: websites, social media tools) to operate effectively.

In the #BCTECH Strategy, students and graduates who are planning their careers, academic and professional, will have informed guidance and full information about career options in tech.

- **Q** I am a student who lives in a remote community, and my school does not offer courses that challenge me. What opportunities are open to me?
  - **A** Annually, over 80,000 students take at least one course from one of 73 distance learning schools in the province. Many students who live in rural communities choose to take a distance learning course because of timetable conflicts or because a specialist teacher is not available in their small school. Check the LearnNowBC website (https://learnnowbc.ca/courses/) to find a course that might meet your learning needs.
  - **A** Schools have the option of creating Independent Directed Studies options for individual students.

Of course, nothing substitutes for experience. Work integrated learning programs, like co-op or dual credit programs, continue to give high school students the opportunity to get early exposure and experience in a career, while earning both high school credits and credits toward postsecondary certificates and diplomas.

- **Q** I am equally interested in a career in the high tech field and in commercial baking. Can I participate in work experiences for both of these interests?
  - **A** Yes, students can take work experience courses in addition to the Ministry-authorized WEX 12A and 12B courses to a maximum of 16 credits. Students can work with district or school staff to continue work experience programming through Individual Directed Studies (IDS) or through a Board/Authority Authorized (BAA) course offered in their district. WEX, IDS, and BAA courses can occur at different sites, enabling students to pursue different career interests and to do so simultaneously.
- **Q** Do students have to be in high school to participate in work experience programs?
  - **A** Students must be 14 years or older and still of school age to take part in a Work Experience programs.
- **Q** I do not know what career I am interested in after I graduate – how can work experience help me make up my mind?
  - **A** Both school-sponsored career exploration and community-based work experience help prepare students for the transition from secondary school to the world of work or further education and training. Work experience provides students with an opportunity to apply classroom learning in a context outside school and to bring back to the classroom new perspectives about their learning. Work experience also provides students with the chance to gain new skills that can be used in future work opportunities.

To incent students to get experience and prepare for the transition from the educational world to the professional one, we are also increasing the number of students earning elective graduation credit for participating in Work Experience Electives in the technology sector.

- **Q** How will the number of students involved be increased? What incentives are you talking about? How can I access this incentive?
  - **A** The incentive is the opportunity for on-the-job experience with an employer while earning elective credits. Further, some Work Experience placements are paid positions.
  - **A** The Ministry of Education has funded additional on-the-ground support in school districts to connect students with employers for work experience, and with post-secondary institutions for dual credit. We refer to the individuals providing this support as "shoulder tappers". The additional support began with northern districts and will be extended to other districts this year.
  - **A** Students and parents should check with school or district career program coordinators about local work experience and dual credit opportunities.

Seward, Myrna EDUC:EX

From: Winkelmans, Tim EDUC:EX
Sent: Friday, September 11, 2015 10:18 AM
To: Hawkes, Mark EDUC:EX; Walt, Nancy J EDUC:EX; Munro, Brent D EDUC:EX
Subject: RE: additional ADST team member?

I'm interested in attending because of the Tech and Innovation strategy. Thus to talk about dual credit and work experience, and possibly the coding initiative. I'm open to how the curriculum work might be addressed. The role of the BCCAT articulation groups in K-12 curriculum activities is broader, especially as there are more articulation groups than curriculum teams.

From: Hawkes, Mark EDUC:EX
Sent: Friday, September 11, 2015 10:12 AM
To: Walt, Nancy J EDUC:EX; Munro, Brent D EDUC:EX
Cc: Winkelmans, Tim EDUC:EX
Subject: additional ADST team member?

Hi, I've been approached by Mohd Abdullah, Co-chair of the BC Committee on Computing Education which is the Computer Science articulation committee with representatives from post-secondary institutions in BC. Naturally, they are keenly interested in the ADST curriculum, particularly at the grade 10-12 level. They have invited me to their fall meeting, but I think Tim is going to be over there anyway and will attend.

I'm wondering if it might not be a good idea to invite Mohd or one of his colleagues to join the ADST team as they start to discuss ICT at the senior grades.

Please advise.

Mark

Mark Hawkes
E-Learning Coordinator
Learning Division
BC Ministry of Education
250-217-5567

Seward, Myrna EDUC:EX

From: Walt, Nancy J EDUC:EX
Sent: Saturday, October 10, 2015 10:34 AM
To: Collins, Valerie A EDUC:EX; Calleberg, Angie EDUC:EX; Arklie, Nicole EDUC:EX
Cc: Winkelmans, Tim EDUC:EX; Munro, Brent D EDUC:EX
Subject: Fwd: Technology questions

See question #1. Do you have technology embedded in the standards? If so can you give me an example? PCAP is at grade 8.

It's fine if the answer is no. Coding and computational thinking skills will be in the new ADST curriculum. And we have tended to think of technology as a tool and an enabler and not something we would prescribe. And Tim's area does have a broader tech strategy. Thanks.

Sent from my iPhone

Begin forwarded message:

> **From:** Elizabeth Costa <eecosta@gov.pe.ca>
> **Date:** October 7, 2015 at 5:53:04 PM PDT
> **To:** <richard.joines@eqao.com>, <marc-andre.morais@gnb.ca>, <sandra.mackinnon@gnb.ca>, <Janusz.Zieminski@gov.ab.ca>, <marisa.cooper@gov.ab.ca>, <Nancy.Walt@gov.bc.ca>, <jennifer.maw@gov.mb.ca>, <RonSmith@gov.nl.ca>, <tom_aikman@gov.nt.ca>, <dmearns@gov.nu.ca>, <Jolene.Holtvogt-Briens@gov.sk.ca>, "Simon Blakesley(simon.blakesley@gov.yk.ca)" <simon.blakesley@gov.yk.ca>, <Joanne.Latourelle@mels.gouv.qc.ca>, <lennie.comeau@novascotia.ca>, <beth.brown@ontario.ca>
> **Subject: Technology questions**
>
> Hello everyone,
> Good to see many of you last week in Toronto! A few of us stayed an extra day to gather and compile information that would inform the decision regarding whether PCAP 2019 would be administered as an online/computer-based assessment.
> We would appreciate if you could provide us with answers to the following questions:
> 1) Does your provincial curricula have technology embedded into learning outcomes in 1) Reading, 2) Math and/or 3) Science?
> 2) Does your province have a separate Technology Action Plan?
> We are under very tight time lines to have our work completed so we would appreciate as timely a turn-around as possible.
> Many thanks to each of you in advance!
> Sincerely,
> Elizabeth
> Elizabeth Costa, PhD
> Director of Instructional Development and Achievement,
> Department of Education, Early Learning and Culture.
> Holman Centre, 250 Water Street
> Summerside, PE C1N 1B6
> Telephone: (902) 438-4820

Seward, Myrna EDUC:EX

From: Walt, Nancy J EDUC:EX
Sent: Tuesday, October 13, 2015 12:30 PM
To: Calleberg, Angie EDUC:EX; Collins, Valerie A EDUC:EX; Arklie, Nicole EDUC:EX
Cc: Winkelmans, Tim EDUC:EX; Munro, Brent D EDUC:EX
Subject: RE: Technology questions

Thanks so much. I will compile a response from all your responses and will check in with Tim. Nancy

---

From: Calleberg, Angie EDUC:EX
Sent: Tuesday, October 13, 2015 12:14 PM
To: Walt, Nancy J EDUC:EX; Collins, Valerie A EDUC:EX; Arklie, Nicole EDUC:EX
Cc: Winkelmans, Tim EDUC:EX; Munro, Brent D EDUC:EX
Subject: RE: Technology questions

Hi Nancy,

We have not articulated a technology standard specifically in the Science curriculum but do want to enable teachers and students to explore these areas of science technology and tools. As such, we have some tool-based references to technology embedded in Science learning standards. For example, in Grade 8 within the curricular competencies you'll find the following learning standards:

- Observe, measure, and record data (qualitative evidence expressed through words, descriptions, interviews, narratives and quantitative evidence expressed through numbers and measurement), using equipment, including digital technologies, with accuracy appropriate to the task
- Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, key, scale models, and digital technologies as appropriate
- Communicate ideas, findings, and solutions to problems, using scientific language, representations, and digital technologies as appropriate

There are also ties to technology in the elaborations for the content learning standards, such as in Grade 8, 'ways of sensing light' includes elaborations on optical instruments and cameras. Another example from Grade 8 would be using electromagnetic radiation for cancer treatments.

Angie

Angie Calleberg
Curriculum and Assessment
Ministry of Education
250-886-2892
angie.calleberg@gov.bc.ca

From: Walt, Nancy J EDUC:EX
Sent: Saturday, October 10, 2015 10:34 AM
To: Collins, Valerie A EDUC:EX; Calleberg, Angie EDUC:EX; Arklie, Nicole EDUC:EX
Cc: Winkelmans, Tim EDUC:EX; Munro, Brent D EDUC:EX
Subject: Fwd: Technology questions

See question #1. Do you have technology embedded in the standards? If so can you give me an example? PCAP is at grade 8.

It's fine if the answer is no. Coding and computational thinking skills will be in the new ADST curriculum. And we have tended to think of technology as a tool and an enabler and not something we would prescribe. And Tim's area does have a broader tech strategy. Thanks.

Sent from my iPhone

Begin forwarded message:

From: Elizabeth Costa <eecosta@gov.pe.ca>
Date: October 7, 2015 at 5:53:04 PM PDT
To: <richard.joines@eqao.com>, <marc-andre.morais@gnb.ca>, <sandra.mackinnon@gnb.ca>, <Janusz.Zieminski@gov.ab.ca>, <marisa.cooper@gov.ab.ca>, <Nancy.Walt@gov.bc.ca>, <jennifer.maw@gov.mb.ca>, <RonSmith@gov.nl.ca>, <tom_aikman@gov.nt.ca>, <dmearns@gov.nu.ca>, <Jolene.Holtvogt-Briens@gov.sk.ca>, "Simon Blakesley(simon.blakesley@gov.yk.ca)" <simon.blakesley@gov.yk.ca>, <Joanne.Latourelle@mels.gouv.qc.ca>, <lennie.comeau@novascotia.ca>, <beth.brown@ontario.ca>
Subject: Technology questions

Hello everyone,
Good to see many of you last week in Toronto! A few of us stayed an extra day to gather and compile information that would inform the decision regarding whether PCAP 2019 would be administered as an online/computer-based assessment.
We would appreciate if you could provide us with answers to the following questions:
1) Does your provincial curricula have technology embedded into learning outcomes in 1) Reading, 2) Math and/or 3) Science?
2) Does your province have a separate Technology Action Plan?
We are under very tight time lines to have our work completed so we would appreciate as timely a turn-around as possible.
Many thanks to each of you in advance!
Sincerely,
Elizabeth
Elizabeth Costa, PhD
Director of Instructional Development and Achievement,
Department of Education, Early Learning and Culture.
Holman Centre, 250 Water Street
Summerside, PE C1N 1B6
Telephone: (902) 438-4820

~ assessment in the service of learning ~ Anne Davies

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communication par erreur, veuillez en informer l'expéditeur immédiatement. Si vous n'êtes pas le destinataire prévu, vous n'avez pas le droit d'utiliser, de divulguer, de distribuer, de copier ou d'imprimer ce courriel ou encore de vous en servir, et vous devriez le supprimer complètement de votre système informatique.

Seward, Myrna EDUC:EX

From: Winkelmans, Tim EDUC:EX
Sent: Tuesday, October 13, 2015 4:43 PM
To: Walt, Nancy J EDUC:EX
Cc: Munro, Brent D EDUC:EX
Subject: RE: Technology questions

Provincial Technology Action Plan
The government of BC has a Technology & Innovation strategy in development, but details will not be available until November.

From: Walt, Nancy J EDUC:EX
Sent: Saturday, October 10, 2015 10:34 AM
To: Collins, Valerie A EDUC:EX; Calleberg, Angie EDUC:EX; Arklie, Nicole EDUC:EX
Cc: Winkelmans, Tim EDUC:EX; Munro, Brent D EDUC:EX
Subject: Fwd: Technology questions
See question #1. Do you have technology embedded in the standards? If so can you give me an example? PCAP is at grade 8.
It's fine if the answer is no. Coding and computational thinking skills will be in the new ADST curriculum. And we have tended to think of technology as a tool and an enabler and not something we would prescribe. And Tim's area does have a broader tech strategy. Thanks.

Sent from my iPhone

Begin forwarded message:

> **From:** Elizabeth Costa <eecosta@gov.pe.ca>
> **Date:** October 7, 2015 at 5:53:04 PM PDT
> **To:** <richard.joines@eqao.com>, <marc-andre.morais@gnb.ca>, <sandra.mackinnon@gnb.ca>, <Janusz.Zieminski@gov.ab.ca>, <marisa.cooper@gov.ab.ca>, <Nancy.Walt@gov.bc.ca>, <jennifer.maw@gov.mb.ca>, <RonSmith@gov.nl.ca>, <tom_aikman@gov.nt.ca>, <dmcarns@gov.nu.ca>, <Jolene.Holtvogt-Briens@gov.sk.ca>, "Simon Blakesley(simon.blakesley@gov.yk.ca)" <simon.blakesley@gov.yk.ca>, <Joanne.Latourelle@mels.gouv.qc.ca>, <Jennie.comeau@novascotia.ca>, <beth.brown@ontario.ca>
> **Subject: Technology questions**
>
> Hello everyone,
> Good to see many of you last week in Toronto! A few of us stayed an extra day to gather and compile information that would inform the decision regarding whether PCAP 2019 would be administered as an online/computer-based assessment.
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> 1) Does your provincial curricula have technology embedded into learning outcomes in 1) Reading, 2) Math and/or 3) Science?
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> We are under very tight time lines to have our work completed so we would appreciate as timely a turn-around as possible.
> Many thanks to each of you in advance!
> Sincerely,
> Elizabeth

Elizabeth Costa, PhD
Director of Instructional Development and Achievement,
Department of Education, Early Learning and Culture.
Holman Centre, 250 Water Street
Summerside, PE C1N 1B6
Telephone: (902) 438-4820

~ assessment in the service of learning ~ Anne Davies

Seward, Myrna EDUC:EX

From: Winkelmans, Tim EDUC:EX
Sent: Friday, October 16, 2015 1:10 PM
To: Munro, Brent D EDUC:EX
Subject: coding stuff

Use whatever helps from this:

- Two years ago, the Ministry released a **Digital Literacy Framework,** a set of guidelines for teachers to support the interest, attitude and ability of learners to appropriately use digital technology and communication tools.
    - The Framework has 6 categories; one of these, **Technology Operations and Concepts,** addresses coding-related outcomes for students.

New Curriculum

Within the new curriculum, **coding** is included in **Applied Design, Skills, and Technologies** (formerly Applied Skills). As students move through the system, they are exposed to coding and related programs as follows:

Grades K-2:

- Students understand the basics of hardware and software and how they work together.

Grades 3-5:

- Students create simple computer programs using tools such as Scratch or Logo.

Grades 6-9:

- Students explore Information and Communications Technologies (ICT) concepts in greater depth through three new modules:
    - Digital Literacy/Citizenship
    - Computational Thinking (precursor to coding at higher levels)
    - Computers and Communications Devices
- All students will experience coding by the end of Grade 9.

Grades 10-12:

- Students identify and explore career options in ICT.
- Students that are interested in ICT sector careers gain in-depth training, experience, and certifications through:
    - special modules, such as a coding module for Skills Exploration 10-12 that will focus on coding skills needed for trades such as machinist (to be completed for use in September 2016);
    - new and updated provincial courses;
    - locally-developed courses;
    - dual-credit transition programs with post-secondary institutions; and
    - work-experience placements with employers.

Rationale

The Applied Design, Skills, and Technologies curriculum builds on students' natural curiosity, inventiveness, and desire to create and work in practical ways. It harnesses the power of learning by doing, and provides the challenging fun that inspires students to dig deeper, work with big ideas, and adapt to a changing world. It provides learning opportunities through which students can discover their interests in practical and purposeful ways.

Applied Design, Skills, and Technologies includes skills and concepts from the disciplines of Business Education, Home Economics, Information Technology, and Technology Education, as well as rich opportunities for cross-curricular work and space for new and emerging areas, such as Media Arts.

Business Education builds an understanding of business skills and concepts in the context of current technology, ethical standards, and an increasingly global economy, empowering students with economic, financial, consumer, and communication skills for lifelong participation in local and global contexts.

Home Economics focuses on fundamental needs and practical concerns of individuals and families in a changing and challenging world. It integrates knowledge, processes, and practical skills from multiple areas, including foods, textiles, and family studies, and provides opportunities for creative applications and critical examination from global citizenship perspectives.

Information Technology encompasses evolving processes, systems, and tools for creating, storing, retrieving, and modifying information. As students design, share, and adapt knowledge in critical, ethical, purposeful, and innovative ways, they gain perspective on the long-term implications of life in a digital, connected world and develop literacies to responsibly take ownership of such technologies to augment learning and benefit society.

Technology Education involves students in the design and fabrication of objects using a variety of materials, methods, technologies, and tools in order to develop their ability to shape and change the physical world to meet human needs. It may include woodwork, metalwork, electronics, drafting, automotive technology, power mechanics, and robotics.

Using creative and critical thinking, students can work collaboratively to problem find and solve by exploring materials, using tools and equipment, designing and building, developing processes, and communicating the merits of their work. They can learn to critically evaluate the appropriateness of the products they develop and those developed by others. As they explore the role of culture, including local Aboriginal cultures, in the development of practical and innovative solutions to human needs, they can develop a sense of personal and social responsibility for the products they use and develop, and their effects on individuals, communities, and the environment, now and in the future.

Learning in Applied Design, Skills, and Technologies provides firm foundations for lifelong learning and, for some, specialized study and a diverse range of careers. It develops well-rounded citizens who are informed creators and consumers. It fosters the development of future problem solvers, innovators, and skilled tradespeople who can contribute to solving problems not yet anticipated with processes and technologies not yet imagined in order to improve their lives, the lives of others, and the environment.

Goals

The BC Applied Design, Skills, and Technologies curriculum contributes to students' development as educated citizens through the achievement of the following goals. Students are expected to

- acquire practical skills and knowledge that they can use to bring their ideas from conception to fruition
- develop a sense of efficacy and personal agency about their ability to participate as inventors, innovators, and agents of change to solve practical problems in a rapidly changing world
- explore how the values and beliefs of cultures, including local Aboriginal cultures, affect the development of products, services, and processes
- understand the environmental implications of the products they are designing and constructing
- investigate and actively explore a variety of areas, including aspects of Business Education, Home Economics, Information Technology, and Technology Education, and new and emerging fields, in order to develop practical hands-on skills and make informed decisions about pursuing specialized interests for personal enjoyment or careers
- develop a lifelong interest in designing, making, and evaluating products, services, and processes, and contributing through informed citizenship, volunteer work, or their careers, to finding and solving practical problems.

Applied Design, Skills, and Technologies: What's New?

As part of the current work of transforming the BC provincial curriculum, there is an intention to bring applied learning to all curricula. This is being done in two ways. Firstly, individual areas of learning are being revised to place greater emphasis on curricular competencies, the *doing* part of the curricula. Secondly, the Applied Skills curricula are being re-envisioned as a K-12 program.

The name "Applied Design, Skills, and Technologies" replaces "Applied Skills." The new name is intended to better capture the scope and nature of the domain. Design involves the ability to combine an empathetic understanding of the context of a problem, creativity in the generation of insights and solutions, and critical thinking to analyze and fit solutions to the context. To move from design to final product or service requires skills and technology. Skills are the abilities gained through competence to do something and to do it increasingly well. Technologies are tools that enable human capabilities, and range from blunt-nosed scissors, to tablets, to drill presses, depending on the grade level, available resources, and facilities.

In Applied Design, Skills, and Technologies (ADST), students will grow in their ability to use design thinking to gain an understanding of how to apply their skills to problem finding and solving using appropriate technologies.

Kindergarten to Grade 5

What's the same?

- Teachers will continue to provide students with opportunities to design and make things in the context of exploratory and purposeful play and learning in various areas of learning.
- No additional instructional time or resources will be necessary.
- There will be no requirement to communicate student learning for ADST K-5 as a separate area of learning on an on-going basis.

What's new?

- This is a new provincial curriculum for K-5.
- The K-5 curriculum consists only of Curricular Competencies and Big Ideas. The intent is that these will provide a common focus and a common language for the designing and making activities that are currently a normal part of students' learning experiences in K-5 classrooms.
- There is one set of Curricular Competencies for K-3, with simplified design stages that are naturalistic and developmentally appropriate.
- There is another set of Curricular Competencies for Grades 4 and 5 with more detailed design stages to reflect a developmental progression and encourage more purposeful designing and making.
- This is a simplified curriculum that has no Content learning standards for K-5. The intent and requirement is that teachers use the learning standards for Curricular Competencies from ADST K-5 with grade-level content from other areas of learning to provide students with cross-curricular opportunities to develop foundational mindsets and skills in design thinking and making.
- Teachers will be required to communicate student learning in ADST at the end of grade 3, and at the end of grade 5 only.

Grades 6 and 7

What's the same?

- Middle schools or other schools that currently offer a rotation of modular explorations will be able to accommodate the redesigned ADST curriculum within their current delivery models.

What's new?

- This is a new provincial curriculum for Grades 6 and 7.
- The curriculum is modular in design to allow for choice and a variety of delivery models, depending on the school configuration, facilities, and student interest.
- The curriculum is identical for the two grades. The intent is that students do at least three Content modules in each grade.
- The Curricular Competencies and Big Ideas are identical for all Content modules.
- Schools may choose from among the modules provided in the provincial curriculum or develop new modules that use the Curricular Competencies of ADST 6-7 with locally developed content.
- Locally developed modules can be offered in addition to, or instead of, the modules in the provincial curriculum.
- The curriculum has been developed to accommodate delivery in regular classrooms or specialized facilities, and by generalist or specialist teachers. The non-mandatory elaborations are intended to show what is doable in a regular classroom.
- Schools that currently have an exploratory rotation may choose to continue with that delivery model for ADST. Schools that do not currently have an exploratory rotation may wish to develop one, or to teach ADST modules in an integrated cross-curricular way with other areas of learning.
- There will be a requirement to communicate student learning in ADST.

Grades 8 and 9

What's the same?

- There are provincial curricula in Business Education, Home Economics, Information Technology, and Technology Education.
- Schools will continue to encourage exploration as well as offering students choices.
- There is an assumption that there is reasonable access to specialized facilities and specialist teachers at these grade levels.
- Schools will be able to accommodate the redesigned ADST curriculum within their current delivery models.

What's new?

- The Curricular Competencies and Big Ideas for Grade 8 are the same as for Grade 7.
- The Curricular Competencies and Big Ideas for Grade 9 will be continued for Grade 10.
- There are separate sets of Content options for Grade 8 and Grade 9. These may be offered as modular rotations of varying length, as is common for Grade 8 now, or as full-year courses, as is often the case in Grade 9 now.
- The Curricular Competencies and Big Ideas are the same for all of the Content modules in a grade.

- Schools are expected to offer students the equivalent of a "full-year" program in ADST. This can be made up of one or more modules.
- Schools must offer the module on Computational Thinking to all grade 8 students.
- In addition to the module on Computational Thinking, schools may choose from among the modules provided in the provincial curriculum or develop new modules that use the Curricular Competencies of ADST 8 or 9 with locally developed content.
- Locally developed modules can be offered in addition to, or instead of, the modules in the provincial curriculum.
- As the new ADST curriculum has explorations starting in Grade 6, schools may wish to offer students more choice in Grades 8 and 9 than was offered previously.
- There will be a requirement to communicate student learning in ADST.

What's coming for Grades 10 to 12?

What will be the same?

- There will be provincial curriculum in the areas of Business Education, Home Economics, Information Technology, and Technology Education and related disciplines.
- Students in Grades 10 to 12 will have opportunities to specialize in a specific area or to continue to explore their interests in more than one area. The specialization might be driven by students' desire for practical skills in a particular area, their interests and passions, or their plans for post-secondary education or careers.
- School districts will be able to continue to offer and develop local courses to augment provincial curricular offerings.

What will be new?

- The provincial curricula for Grades 10 to 12 will be reconfigured to match the intent and directions of ADST and to build on the explorations in Grades 6 to 9, and redesigned to match the current curricular design.
- The Curricular Competencies and Big Ideas for Grade 9 will also be used for all Grade 10 ADST curricula, for consistency and continuity.
- One set of Curricular Competencies and Big Ideas will be developed for Grades 11 and 12 and used for all Grade 11 and 12 ADST curricula.
- There will be greater emphasis in all ADST curricula on student choice about what products to design and make.
- Content learning standards will identify concepts and topics. This will create the space for students to personalize their learning by making choices about what they design and make and the depth and breadth of their learning on a particular concept based on their own interests and passions. The generality of the learning standards for Content will also facilitate inclusion by allowing the teacher or the student to adjust depth and breadth to match abilities.
- Local design options will be encouraged to meet local needs. Maximizing flexibly in curriculum delivery by enabling combinations of locally and provincially designed course content is ideal.
- Information Technology curricula will be significantly updated with input from post-secondary institutions.

Introduction to Applied Design, Skills, and Technologies

The ability to design and make, acquire skills as needed, and apply technologies is important in the world today and a key aspect of educating citizens for the future.

The new and redesigned Applied Design, Skills, and Technologies (ADST) curriculum is an experiential, hands-on program of learning through design and creation that includes skills and concepts from traditional and Aboriginal practice; from the existing disciplines of Business Education, Home Economics, Information Technology, and Technology Education; and from new and emerging fields. It envisions a K-12 continuum fostering the development of the skills and knowledge that will allow students to create practical and innovative responses to everyday needs and problems.

Features of the ADST curriculum

- There is a renewed focus on designing and making, the acquisition of skills, and the application of technologies.
- The ADST curriculum is now a provincial curriculum for K-12 that can be delivered in different ways at different grade levels.
- There is a common set of curricular competencies for all of the ADST (formerly Applied Skills) curricula – Business Education, Home Economics, Information Technology, Media Arts, and Technology Education – that can also be used as a template for locally developed options now and in the future.

Design of the ADST curriculum

Big Ideas

The Big Ideas of the ADST curriculum are derived from the Curricular Competencies. The Big Ideas are intended to capture a progression of learning in applying design processes, skills, and technologies.

	K-3	4-5	6-8	9-10
Applied Design	Designs grow out of natural curiosity.	Designs can be improved with prototyping and testing.	Design can be responsive to identified needs.	Social, ethical, and sustainability considerations impact design.
Applied Skills	Skills can be developed through play.	Skills are developed through practice, effort, and action.	Complex tasks require the acquisition of additional skills.	Complex tasks require the sequencing of skills.
Applied Technologies	Technologies are tools that extend human capabilities.	The choice of technology and tools depends on the task.	Complex tasks may require multiple tools and technologies.	Complex tasks require different technologies and tools at different stages.

Curricular Competencies

The Curricular Competencies are organized under three headings:

- Applied Design
- Applied Skills
- Applied Technologies

The Curricular Competencies under Applied Design are further organized under subheadings that reflect general stages of designing and making. For Grades 4 to 12, these are:

- Understanding context
- Defining
- Ideating
- Prototyping
- Testing
- Making
- Sharing

Elaborations for the Curricular Competencies provide definitions for clarity.

The subheadings for K-3 are simplified in order to be developmentally appropriate; for example, young children do not prototype, test, and make as discernibly separate stages when they are designing and making through exploratory and purposeful play. The three stages of Applied Design that are identified for Kindergarten to Grade 3 encompass all of the stages of designing and making that are identified at higher grade levels, but in a naturalistic and developmentally appropriate way. They are:

- Ideating
- Making
- Sharing

An important feature of the ADST curriculum is that the Curricular Competencies do not change for every grade. They remain the same for K-3, and then there is a set for 4-5, 6-8, 9-10, and 11-12. Even then, the changes are quite incremental. This aspect of the curricular design is intended to provide a consistent focus for both students and teachers on the "doing" aspect of the curriculum and to encourage student metacognition.

Students use and develop the core competencies of creative and critical thinking, communication, and the personal and social competencies through the Curricular Competencies of ADST. The following chart gives some examples, but is not an exhaustive list.

	K-3	4-5	6-8	9-10
Thinking	Generate ideas from their experiences and interests Add to others' ideas	Generate potential ideas Add to others' ideas Screen ideas against the objective and constraints	Generate potential ideas Add to others' ideas Screen ideas against criteria and constraints	Take risks in generating ideas Add to others' ideas in ways that enhance them Screen ideas against criteria and constraints

Communication	Tell the story of designing and making their product Reflect on their ability to work effectively both as individuals and collaboratively in a group	Explain their process Reflect on their ability to work effectively both as individuals and collaboratively in a group, including their ability to share and maintain a co-operative work space	Explain their process, using appropriate terminology, and provide reasons for selected solutions and modifications Evaluate their ability to work effectively both as individuals and collaboratively in a group, including the ability to share and maintain an efficient co-operative work space	Provide a rationale for the selected solution, modifications, and procedures, using appropriate terminology Evaluate their ability to work effectively both as individuals and collaboratively in a group, including the ability to share and maintain an efficient co-operative work space
Personal and Social	Identify how their product contributes to the individual, family, community, and/or environment	Identify how their product contributes to the individual, family, community, and/or environment	Evaluate personal, social, and environmental impacts and ethical considerations Identify personal, social, and environmental impacts of the use of technology	Critically analyze and prioritize competing factors, including social, ethical, and sustainability considerations, to meet community needs for preferred futures Identify how technology use can differ depending on culture, economics, access to resources, and social expectations

Content

The ADST curriculum does not specify any Content learning standards for Kindergarten through Grade 5. The intent is that teachers use the Curricular Competencies from ADST K-5 with grade-level content from other areas of learning to provide students with cross-curricular opportunities to develop foundational mindsets and skills in design thinking and making. For example, students might design and build something based on the Content learning standards in the Science or Social Studies curriculum.

For Grades 6 to 12, the Content is concept-based and includes learning standards for the four existing Applied Skills disciplines (Business Education, Home Economics, Information Technology, and Technology Education) and for new and emerging fields such as Media Arts.

Content learning standards are stated as topics. This creates the space for students to personalize their learning by making choices about what they design and make and the depth and breadth of their learning on a particular topic based on their own interests and passions.

The generality of the Content learning standards also facilitates inclusion by allowing the teacher or the student to adjust depth and breadth to match abilities.

Grades 6 to 9 are intended as exploration years. For Grades 6 and 7, this is a new provincial curriculum; for Grades 8 and 9, it is a redesigned curriculum.

The curriculum provides one set of Content options for Grades 6 and 7 that are intended to be short modules that may be offered in rotation. Over the two years, students may be exposed to several of these and perhaps other locally developed options that also use the Curricular Competencies of ADST with locally developed content. This approach provides provincial recognition of the variety and scope of existing locally developed middle years programs and a template for the development of additional local programs.

Care has been taken to develop Content learning standards that can be delivered in a variety of settings, from regular classroom to specialized lab and shop facilities. The Content elaborations, which are non-mandatory, have been developed with a view to what is doable in a regular classroom.

There are separate sets of Content options for Grade 8 and Grade 9. These may be offered as modular rotations of varying length, as is common for Grade 8 now, or as full-year courses, as is often the case in Grade 9 now. The Content elaborations are non-mandatory curricular supports that suggest possible depth and breadth for teaching concepts.

Considerations for delivering ADST

At all grade levels

- The focus on hands-on designing and making, acquisition and honing of skills, and choosing and applying technologies requires a high degree of student choice, although there may still be a place for common activities for specific purposes — for example, to introduce new skills or equipment, to communicate safety procedures, or to explicitly focus on one aspect of the design process.
- The curriculum is inclusive of modern and traditional Aboriginal design, skills, and technologies. Students should have opportunities to learn from local First Peoples. This will require an understanding by both students and teachers of issues of appropriation, and that some knowledge is considered sacred.

Kindergarten to Grade 5

- Students can be given opportunities to develop foundational skills in ADST through exploratory and purposeful play, and through designing and making activities related to the content in other areas of learning. This is already a normal practice in K-5 classrooms and will not require additional time or resources.
- A single set of Curricular Competencies for K-3 provides common language and continuity for the first four years.
- Another set of Curricular Competencies for Grades 4 and 5 with more stages delineated for Applied Design encourages students to take a more purposeful approach to designing and making.
- There will be no requirement to communicate student learning for ADST K-5 as a separate area of learning on an on-going basis. Teachers will be expected to communicate learning in ADST at the end of grade 3 and at the end of grade 5 only.

Grades 6 and 7

- The curriculum is designed to be modular to allow for choice and a variety of delivery models depending on school configuration and facilities and student interest.
- The curriculum has been developed to accommodate delivery in regular classrooms or specialized facilities, and by generalist or specialist teachers. The non-mandatory elaborations are intended to show what is doable in a regular classroom.
- The requirement will be that students experience a minimum of three modules of ADST in each of Grades 6 and 7. Schools may choose from among the modules provided in the provincial curriculum or develop new modules that use the Curricular Competencies of ADST 6-7 with locally developed content. Locally developed modules can be offered in addition to, or instead of, the modules in the provincial curriculum.
- Schools that currently have an exploratory rotation may choose to continue with that delivery model for ADST. Schools that do not currently have an exploratory rotation may wish to develop one, or to teach ADST modules in an integrated cross-curricular way with other areas of learning.
- There will be a requirement to communicate student learning in ADST overall, but not module by module.

Grades 8 and 9

- Schools will be able to accommodate the redesigned ADST curriculum within their current delivery models.
- There is an assumption that there is reasonable access to specialized facilities and specialist teachers at these grade levels.
- The curriculum may be offered as modular rotations of varying length, as is common for Grade 8 now, or as full courses, as is often the case in Grade 9 now.
- There are more Content learning standards for Grade 9, as schools often offer these as full courses.
- Schools are expected to offer students the equivalent of a "full-year" program in ADST. This can be made up of one or more modules.
- Schools must offer the module on Computational Thinking to all grade 8 students.
- In addition to the module on Computational Thinking, schools may choose from among the modules provided in the provincial curriculum or develop new modules that use the Curricular Competencies of ADST 8 or 9 with locally developed content. Locally developed modules can be offered in addition to, or instead of, the modules in the provincial curriculum.
- As the new ADST curriculum has explorations starting in Grade 6, schools may wish to offer students more choice in Grades 8 and 9 than was offered previously.
- There will be a requirement to communicate learning in ADST.

Seward, Myrna EDUC:EX

From: Walt, Nancy J EDUC:EX
Sent: Friday, January 8, 2016 9:24 PM
To: s.22 Munro, Brent D EDUC:EX
Subject: Latest ADST
Attachments: ADST Big Ideas and learning Standards-Pass 3.docx; Introduction to ADST PASS 3.docx; ADST What's New PASS 3.docx; ADST Rationale and Goals.docx

s.13

Nancy Walt
Director
Curriculum and Assessment
Learning Division
Ministry of Education
250-217-4978
Curriculum Redesign: www.curriculum.gov.bc.ca

Seward, Myrna EDUC:EX

From: Walt, Nancy J EDUC:EX
Sent: Sunday, January 17, 2016 10:35 PM
To: Munro, Brent D EDUC:EX
Subject: Fwd: Tech story in Globe

FYI. Will fill you in. Out of context a smidge.

Hope you had a good holiday.

Sent from my iPhone

Begin forwarded message:

> **From:** "Winkelmans, Tim EDUC:EX" <Tim.Winkelmans@gov.bc.ca>
> **Date:** January 17, 2016 at 9:46:39 PM PST
> **To:** "Unwin, Jan EDUC:EX" <Jan.Unwin@gov.bc.ca>, "Espe, Larry EDUC:EX" <Larry.Espe@gov.bc.ca>, "Walt, Nancy J EDUC:EX" <Nancy.Walt@gov.bc.ca>
> **Subject: Fwd: Tech story in Globe**
>
> Tomorrow just got more interesting
>
> Sent from my iPhone
>
> Begin forwarded message:
>
> > **From:** "Keenan, Jason GCPE:EX" <Jason.Keenan@gov.bc.ca>
> > **Date:** January 17, 2016 at 9:28:27 PM PST
> > **To:** "Winkelmans, Tim EDUC:EX" <Tim.Winkelmans@gov.bc.ca>, "McCrea, Jennifer EDUC:EX" <Jennifer.McCrea@gov.bc.ca>, "Ustina, Barb GCPE:EX" <Barb.Ustina@gov.bc.ca>, "Lowther, Brett GCPE:EX" <Brett.Lowther@gov.bc.ca>
> > **Subject: Tech story in Globe**
> >
> > This story -- which focuses on coding in the curriculum - is in the Globe tomorrow. MTICS led the work with the reporter and we provided MTICS the details on the changes.
> >
> > Thanks for all your help Tim!
> >
> > Jason

Jason A Keenan
Communications Director
Ministry of Education
Government Communications and Public Engagement
Office: 250-356-8713 Mobile: 778-679-5546

B.C. to add computer coding to school curriculum

Follow Sean Silcoff on Twitter @SeanSilcoff

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BC Technology Strategy Roll-out 2016

Ministry of Education

Date	Event/Opportunity	Location	Notes	Products
Early Feb.	**Event w/NR** Announcement – Innovation Partnership projects second intake	Van SD#39	John Oliver Secondary develops a STEM program as one of 15 BC schools to benefit from the second intake of Innovation Partnership grants.	Event NR QA EP SN
Early Feb.	**Event w/NR** Announcement – Coding Curriculum	TBD Coding company	Announce details of how/when coding will be included in K-12 new curriculum at a coding camp, either existing company, or pop up.	Event NR QA EP SN
Late Feb. /Early March	**Event w/NR** Announcement – Shoulder Tappers program expands to include tech mentorship	Northern School TBA	Shoulder Tappers investment in partnership with Northern Development Initiatives Trust expands to include more technology career mentorship	Event NR
Mar 21 – April 1	**Tours – during break week** tour schools putting the new curriculum in action with strong tech component	various	**Proposed regional opportunities:** • Innovation Funding: Vernon – mobile STEAM maker space • Shoulder Tappers: identify northern school with tech program in place • Innovation Funding: James Kennedy Elementary, Langley Raspberry Pi supports STEM curriculum • Innovation Funding: Rick Hansen Secondary, Abbotsford, creating 'digital nerve centres'. • Innovation Funding: Templeton Secondary, Van. STEM programming	Tour Event NR
Mar 21 – April 1	**Tour/visits – during break week** tour independent Coding Camps with school kids in action	Van	**Possible regional opportunities:** • Lighthouse Labs, Van • UBCO, Kelowna • MetaLab, Victoria • Innovation Central Society, PG	Tour Event NR
Late May/ Early	**Tour/announcement – curriculum update, announce at sec school already using curric**	TBA	New K-9 curriculum with new standards in science and math and opps for coding is being	Event NR OpEd

June			implemented in all BC schools in 2016/17, while new 10-12 curriculum is in place for teachers to use on trial basis 2017/16	poss.
June TBA	**NR joint announce:** Teachers' Guide to Coding available	TBD	The government funded the Computer Using Educators of BC (CUBEC) to create online coding resource guide for teachers, CUBEC is a Provincial Specialist Assoc within the BCTF	NR QA
Sept.	**Event/NR** – Back to School Focus on coding	TBD	Event/NR to break down: • how coding is being rolled into the new curriculum, • How teachers are being supported and; • What parents and students can expect coding to be rolled into new curric.	Event NR QA

Seward, Myrna EDUC:EX

From: Winkelmans, Tim EDUC:EX
Sent: Thursday, January 21, 2016 10:37 AM
To: Walt, Nancy J EDUC:EX; Munro, Brent D EDUC:EX
Subject: Fwd: Tech strategy roll out 2016
Attachments: Rollout spring 2016 tech opps.docx; ATT00001.htm

I think this is better for you to respond

Sent from my iPhone

Begin forwarded message:

> **From:** "Ustina, Barb GCPE:EX" <Barb.Ustina@gov.bc.ca>
> **Date:** January 21, 2016 at 10:16:58 AM PST
> **To:** "Winkelmans, Tim EDUC:EX" <Tim.Winkelmans@gov.bc.ca>
> **Subject: Tech strategy roll out 2016**
>
> Hi Tim,
> We're doing a tech strategy roll out proposal we need to get to HQ on Monday.
> Do you have any time line for the Coding Curric announcement? Just have a placeholder in for early Feb right now☺
> Please have a look at the attached and let us know your thoughts.
> Thanks!
> **Barb Ustina**
> Senior Public Affairs Officer
> Ministry of Education
> Government Communications & Public Engagement
> **phone:** 250 818-1329

Seward, Myrna EDUC:EX

From: Walt, Nancy J EDUC:EX
Sent: Thursday, February 4, 2016 11:47 PM
To: s.22
Cc: Munro, Brent D EDUC:EX
Subject: FW: New Coding Curriculum

Just letting you know ADST is on a BCTF PSA! We still haven't posted it ☺. Seems to be tied up with a coding event.

From: Hawkes, Mark EDUC:EX
Sent: Thursday, February 4, 2016 4:13 PM
To: Kevin.Brandt@sd41.bc.ca
Cc: Winkelmans, Tim EDUC:EX; Walt, Nancy J EDUC:EX
Subject: RE: New Coding Curriculum

Hello, Kevin:

Thanks for contacting the BC Ministry of Education regarding the implementation of coding in our schools. It sounds like you are doing some great coding work with your students!

Just to clarify and put things in perspective: we don't have a coding curriculum, per se. Coding, or computer programming, is one small aspect of Information and Communications Technology (ICT), which is itself only one of four subject areas contained in what was called Applied Skills, now Applied Design, Skills and Technologies. The others are Technology Education, Home Economics, and Business Education. To take it even further, computer programming is only one application of computational thinking, which is much more important than just coding for developing a well-rounded individual who can think, reason logically, adapt to new situations, and solve problems. Computational thinking is almost on the same level as two of our new Core Competencies: Critical Thinking and Creative Thinking. While coding can lead to coding-related jobs, computational thinking can lead to almost any job! The new ADST curriculum emphasizes design thinking and hands-on, project-based learning. Students should learn computational thinking in the elementary grades, then apply that mindset to learning simple coding in the middle grades, moving on to more complex coding in senior high school, if they have found they are interested in it.

Here are some quotes by BC teacher and ADST curriculum writer, Jon Hamlin, that explain the intent of the curriculum:

"What we are looking at is integrating 'big idea' principles about computational thinking in the early grades. You can do it using software tools, but you can just as easily achieve those outcomes by looking for patterns in a jar of jellybeans."

"It's like learning another type of language, it's a cognitive shift: if we can start that process early, it will lessen the learning curve once they get older."

At its core, the curriculum will teach students how come up with ideas to solve a problem, doing research, designing, prototyping, testing, making and sharing, and these curricular competencies can be part of any subject.

Here are links to the new ADST curriculum documents: K-12 Framework, Goals and Rationale document, Introduction document , What's New document, and the K-9 curriculum. The grade 10-12 curriculum is still under development and won't be available until the summer.

In terms of the specific curriculum content related to computational thinking and coding, here it is:

Content	Elaborations
Grades 6/7: **Computational Thinking** *Students are expected to know the following:* ☐ **simple algorithms** that reflect computational thinking ☐ **visual representations** of problems and data ☐ **evolution of programming languages** ☐ **visual programming**	Computational Thinking **simple algorithms:** for sorting, searching, sequence, selection, and repetition; specific statements to complete a simple task; cryptography and code breaking (e.g., cyphers) **visual representations:** graphs, charts, network diagrams, info graphics, flow charts, lists, tables, or arrays **evolution of programming languages:** historical perspectives, evolution (e.g., Ada Lovelace, punch cards, Hollerith, Grace Hopper, Alan Turing, Enigma, cyphers) **visual programming:** for example, Kodu, Scratch
Grade 8: **Computational Thinking** *Students are expected to know the following:* ☐ software programs as specific and sequential instructions with algorithms that can be reliably repeated by others ☐ debugging algorithms and programs by breaking problems down into a series of subproblems ☐ binary number system (1s and 0s) to represent data ☐ programming languages, including **visual programming** in relation to text-based programming and **programming modular components**	**Computational Thinking** **visual programming:** for example, Scratch, Alice, Greenfoot, BlueJ **text-based programming:** for example, HTML **programming modular components:** for example, Arduino, LEGO Mindstorms
Grade 9: **Information and Communications Technologies** ***Students are expected to know the following:*** ☐ **text-based coding** ☐ **binary representation of various data types, including text, sound, pictures, video** ☐ **drag-and-drop mobile development** ☐ **programming modular components**	**Information and Communications Technologies** **text-based coding:** HTML, CSS, JavaScript **drag-and-drop mobile development:** for example Vizwik **modular components:** for example, Arduino Raspberry Pi, LEGO Mindstorms

I hope this helps!

Cheers,

Mark Hawkes
E-Learning Coordinator
Learning Division
BC Ministry of Education

Seward, Myrna EDUC:EX

From: McClintick, Teresa EDUC:EX
Sent: Monday, March 7, 2016 12:05 PM
To: Scott, Nancy A EDUC:EX
Cc: Hawkes, Mark EDUC:EX; Winkelmans, Tim EDUC:EX
Subject: 2016 LD_Technology_Coding_REVTWFeb26-vtm additions-Mar7
Attachments: 2016 LD_Technology_Coding_REVTWFeb26-vtm additions-Mar7.docx

Hi Nancy.

I've added some info that Mark texted me under current status (re: what SDs are doing). As well, I've revised the BCTF Guide date to Sept 1st.

Please let me know if what I've added suffices. As well – I did not save it on the Lan... Can you please?

Thanks,
t

ADVICE TO MINISTER
ESTIMATES NOTE
2016

DRAFT REVISED FEB 26 AS PER JM REVIEW FEEDBACK (TW TO PROVIDE ADDL INFO TO ADDRESS JM'S HIGHLIGHTED NOTES ON REVIEWED COPY

ISSUE: TECHNOLOGY/CODING

ADVICE AND RECOMMENDED RESPONSE:

- **The technology sector supports the BC economy at its very foundation and is a key driver of growth for our economy.**
- **To support this growth, starting in December with the announcement of the $100 million BC Tech Fund, Government has released the #BCTECH Strategy.**
- **The #BCTECH Strategy is the culmination of extensive engagement with BC's technology sector and is a key component of the *BC Jobs Plan.***
- **Talent development needs to start in our schools – so students will have an opportunity to learn the basics of coding.**
- **In the new Applied Design, Skills, and Technologies curriculum, every student will have the opportunity to do coding by the end of Grade 9.**
- **In the #BCTech strategy, the Ministry of Education also committed to:**
  - **Support coding events such as the Hour of Code, under the CodeCreate banner;**
  - **Complete Next Generation Network implementation by December 2016; and**
  - **Support more work experience and dual credit opportunities for students in the tech sector.**

SECONDARY MESSAGES:

- **Coding is part of the computational thinking category in the new curriculum, now available on the curriculum website.**
- **The Ministry supported the technology industry to offer 4 CodeCreate events in December 2015 and January 2016 in Vancouver, Victoria, Prince George, and Kelowna.**
  - **400 students participated in these 4 events**

- **Hundreds more were involved with other Hour of Code activities**

- **A an online coding resource guide for teachers is being developed in partnership with the British Columbia Teachers' Federation (BCTF)**
  - **Anticipated completion – September 1, 2016.**

CURRENT STATUS:

The K-9 coding curriculum is currently a review draft and will be finalized by June 30, 2016.

Grade 10-12 information technology curricula drafts will be available for review by June 30, 2016.

The Ministry of Education will create an advisory committee with industry, post-secondary, non-profit society, and K12 representation.

The Ministry of Education is reviewing its options to provide additional implementation support.

The Next Generation Network upgrades will be implemented in schools by December 2016.

School districts are at various stages of implementation. Some are well ahead, while others are still in the planning stages. Activities that some districts are engaging in include: Hour of Code events; the use of "Scratch" in the classroom; facilitating students developing their own apps; and activities that involve programmable robots.

Many elementary teachers are engaging their students with computational thinking activities not realizing that they are actually teaching coding.

Contact: Tim Winkelmans, Director
Graduation, Skills & Distance Learning
Phone: 250-217-6643

File Created: Feb 20 2016
File Updated: Feb 26 2016
File Location:

SIGN OFF:

Program	Comm. Director	ADM	DM
Tim Winkelmans		Jennifer McCrea	

Seward, Myrna EDUC:EX

From: Stanners, Garrett EDUC:EX
Sent: Thursday, March 24, 2016 11:18 AM
To: Winkelmans, Tim EDUC:EX
Cc: Seward, Myrna EDUC:EX
Subject: FOI request for coding

Hi Tim

This is all that I've got. Thanks!

From: Gregg, David EDUC:EX
Sent: Wednesday, July 22, 2015 10:37 AM
To: Stanners, Garrett EDUC:EX
Subject: RE: Info from survey of Districts

How does this look?
Hands-On Technology & Innovation Classroom Workshop Partnership

- **Supporting Data:**

s.13

- **2022 Labour Market Outlook identifies a number of careers that will require knowledge and skills derived from STEM courses:**
  - **Health professions, including diagnostic imaging, radiation, audiology, nursing, and physician.**
  - **Construction professions, including electricians, welders, steamfitters, millwrights, and engineers**
  - **ICT professions, including programmers, media developers, and network designers**

BC Youth Coding Initiative

- **Supporting Data:**

s.13

  - **2022 Labour Market Outlook identifies a number of careers that will require knowledge and skills derived from student skills with coding courses:**
    - **ICT professions, including programmers, media developers, and network designers**
    - **Web page and application designers and programmers**
    - **Professional occupations in advertising, marketing & public relations**

FIT--Focus on IT Implementation

- **Supporting Data:**
  s.13

    - **2022 Labour Market Outlook identifies a number of careers that will require knowledge and skills derived from student skills with coding courses:**
        - **ICT professions, including programmers, media developers, and network designers**
        - **Web page and application designers and programmers**

Dave Gregg
Graduation, Skills, and Distance Learning Branch
(250) 217-4093

From: Gregg, David EDUC:EX
Sent: Wednesday, July 22, 2015 9:57 AM
To: Stanners, Garrett EDUC:EX
Subject: s.13

s.13

Dave Gregg
Graduation, Skills, and Distance Learning Branch
(250) 217-4093

Seward, Myrna EDUC:EX

From: Winkelmans, Tim EDUC:EX
Sent: Monday, March 14, 2016 10:31 AM
To: Loughran, Tony D AVED:EX
Cc: Hawkes, Mark EDUC:EX
Subject: s.13
Attachments:

Hi, Tony
We have been asked to pull together an advisory committee for the K12 coding/computational thinking implementation. s.13
s.13

s.13

Thanks, Tony

Tim

Seward, Myrna EDUC:EX

From: Winkelmans, Tim EDUC:EX
Sent: Monday, February 22, 2016 10:30 AM
To: Hawkes, Mark EDUC:EX
Subject: FW: Computational Thinking and Coding Implementation Readiness
Attachments: 186248 Computational Thinking & Coding Implementation Readiness - Superintendents.pdf; 186248 Attachment - Coding Environmental Scan Feb 19 2016.docx

This went out

From: Bolton, Elda M EDUC:EX
Sent: Monday, February 22, 2016 10:24 AM
To: Winkelmans, Tim EDUC:EX
Subject: FW: Computational Thinking and Coding Implementation Readiness

From: Bolton, Elda M EDUC:EX **On Behalf Of** EDUC Learning Division EDUC:EX
Sent: Monday, February 22, 2016 9:52 AM
To: 'l_educ_superintendents@lists.gov.bc.ca'
Subject: Computational Thinking and Coding Implementation Readiness

Please see attached letter and Coding Environmental Scan from Jennifer McCrea, Assistant Deputy Minister for Learning, Sector Liaison and Student Safety.

BRITISH COLUMBIA

February 22, 2016

Ref: 186248

All Superintendents of Schools

Dear Colleagues:

Re: Computational Thinking and Coding Implementation Readiness: Environmental Scan

As part of the BC Technology Strategy announced by Premier Christy Clark on January 18 2016, the new Applied Design, Skills and Technologies (ADST) curriculum for K-9 will give British Columbia students an opportunity to learn computational thinking skills and experience coding.

In preparation for the implementation of the redesigned curriculum next September, and the Grade 10-12 curriculum the following year, the Ministry would like to develop a better understanding of district, school and teacher readiness.

The attached survey is intended to be completed by whichever individual in your district has the best sense of the level of this readiness. The survey asks questions in the areas of infrastructure, teacher development, learning resources, and district organization. The information obtained through the survey will inform the Ministry on how we might best support the system.

The survey is a word document and should be completed and emailed to Mark.Hawkes@gov.bc.ca by March 4, 2016.

Thank you for assisting us in this process.

Sincerely,

JMcCrea

Jennifer McCrea
Assistant Deputy Minister, Learning
Sector Liaison and Student Safety

Attachment

Ministry of Education Learning Division

Mailing Address:
PO Box 9887 Stn Prov Govt
Victoria BC V8W 9T6

Location:
620 Superior St
Victoria BC

Computational Thinking and Coding Implementation Readiness Environmental Scan

Background

The ICT component of the new Applied Design, Skills and Technologies curriculum includes **Computational Thinking** and **Coding**. Computational Thinking is a cognitive or thought process involving logical reasoning by which problems are solved and artefacts, procedures and systems are better understood. It includes the ability to think algorithmically, in terms of decomposition, in generalisations, identifying and making use of patterns, in abstractions, choosing good representations, and in terms of evaluation.

Coding involves the translating of the design of a computer system into code form and evaluating it to ensure that it functions correctly under all anticipated conditions. Debugging is the systematic application of analysis and evaluation using skills such as testing, tracing, and logical thinking to predict and verify outcomes.

Grades K-5:
BC's **Digital Literacy Framework** offers teachers descriptions of the types of knowledge and skills students at this level should have to be considered digitally literate. Also, the revised Mathematics K-5 curriculum emphasizes computational thinking-related skills such as reasoning, analyzing, and recognizing patterns.

Grades 6/7:
Students are expected to know the following:

Computational Thinking

- simple algorithms that reflect computational thinking
- visual representations of problems and data
- evolution of programming languages
- visual programming

Grade 8:
Students are expected to know the following:

Computational Thinking

- software programs as specific and sequential instructions with algorithms that can be reliably repeated by others
- debugging algorithms and programs by breaking problems down into a series of sub problems
- binary number system (1s and 0s) to represent data programming languages, including visual
- programming in relation to text-based programming and programming modular components

---

Grade 9:

Students are expected to know the following:

Information and Communications Technologies

- text-based coding
- binary representation of various data types, including text, sound, pictures, video
- drag-and-drop mobile development
- programming modular components

The Grade 10-12 ADST curricula are still under development, but the ICT component will include curriculum standards, competencies and content related to computational thinking, digital literacy, and computer programming. Locally and externally developed courses in these areas, as well as industry certifications, will continue to be an option for districts and students.

Instructions: Please complete and return in Word format to: Mark.Hawkes@gov.bc.ca

School District Name and Number: _____

1. Curriculum and Teacher Development

Question	Educator Readiness (Indicate with an "X" in the appropriate box.)				
	None	Minority	Half	Majority	All
1. Number of K-5 educators ready to integrate computational thinking into teaching practice					
2. Number of Grade 6/7 educators ready to integrate computational thinking into teaching practice					
3. Number of Grade 8-9 ADST (ICT) educators in your district are ready to integrate computational thinking and text-based coding into their teaching practice?					

4. What professional learning/teacher training opportunities in the area of computational thinking and coding currently exist in your district?
(Answer space)

5. What new District teacher development supports are planned in your district to help implement the new curriculum?
(Answer space)

6. What Ministry-provided curriculum and teacher development supports would help in this area?
(Answer space)

2. Infrastructure

NOTE: Next Generation Network upgrades will be complete by the end of 2016.

Question	Infrastructure (Indicate with an "X" in the appropriate box.)			
	Not Able	Somewhat Able	Able	More than Able
1. **Access to computers for students within your district/schools is adequate in terms of:**				
Accessibility:				
Quantity :				
Availability:				
2. **How able is your district's existing computer hardware to meet the requirements of the new ADST curriculum?**				

Question	Infrastructure (Indicate with an "X" in the appropriate box.)	
	Yes	No
3. **Access to computers for students within your district/schools is adequate in terms of:**		
Elementary:		
Middle Secondary:		
4. **Do you have a Bring Your Own Device" (BYOD) policy?**		

Question	Infrastructure (Indicate with an "X" in the appropriate box.)			
	Not Able	Somewhat Able	Able	More than Able
5. **How able is your in school infrastructure able to meet the requirements of the new ADST curriculum?**				
Local area or wired network:				

Elementary:				
Middle:				
Secondary:				
Wireless access within schools:				
Elementary:				
Middle:				
Secondary:				

6. **Is the District adding any infrastructure supports to help implement the new curriculum over the next 1-2 years? Please provide describe your plans and infrastructure to be upgraded:**
(Answer space)

1. Learning Resources

Question	Learning Resources (Indicate with an "X" in the appropriate box.)			
	Not Suitable	Somewhat Suitable	Suitable	More than Suitable
1. How suitable are your district's teacher resources to meet the requirements of the new ADST curriculum?				
2. How suitable are your district's student learning resources to meet the requirements of the new ADST curriculum?				

3. What new District level teacher resources are planned to help implement the new curriculum?
(Answer space)

4. What new District student learning resources are planned to help implement the new curriculum?
(Answer space)

5. What Ministry-provided learning resource supports would help in this area?
(Answer space)

2. Organization for Learning

Question	Organization for Learning (Indicate with an "X" in the appropriate box.)				
	Not Well	Somewhat	Satisfactorily	Well	Very Well
1. How well is your district organized to deliver the new ADST curriculum? (e.g.: team teaching, class rotations, Maker spaces, district coordinators, timetable)					

2. What new District organizational strategies are planned to help implement the new curriculum?
(Answer space)

3. What Ministry-provided organizational supports would help in this area?
(Answer space)

Strategy Rating

Please rate the value of the following potential implementation strategies on a scale from 1-10. (type your score in the box provided for each item):

1. Post-secondary recognition of a revised, more rigorous Computer Science 12 course	
2. Teacher in-service: coding workshops in partnership with industry and post-secondary	
3. Pre-service teacher coding workshops in partnership with Teacher Regulation Branch, BC Teachers' Council, industry and post-secondary	
4. Comprehensive, online, coding resource toolkit to support coding implementation	
5. Distance Learning coding module in partnership with the DL Consortium and Open School BC	

1. What else would you like to tell the Ministry about implementing computational thinking and coding?
(Answer space)

Seward, Myrna EDUC:EX

From: Winkelmans, Tim EDUC:EX
Sent: Monday, March 14, 2016 9:33 AM
To: Hawkes, Mark EDUC:EX
Subject: s.13
Attachments:

From: Morel, David P MTIC:EX
Sent: Monday, March 14, 2016 8:56 AM
To: Winkelmans, Tim EDUC:EX
Cc: McCrea, Jennifer EDUC:EX
Subject: s.13

Good Morning Tim

s.13

David Morel

From: Winkelmans, Tim EDUC:EX
Sent: Friday, March 4, 2016 12:28 AM
To: Morel, David P MTIC:EX
Subject: s.13

Hi, David
s.13

Tim

Comments Education Coding

From John Jacobson

The educational experience needs to provide perspective more than skills, in my view. In looking at the list of industry companies, I'd suggest adding either Phemi or Vizier – both are "big data" (structure-free data) analytics companies. For young people, "coding" should be about the thought process of getting computers to do what they want, unconstrained by the limitations imposed by today's fashions. Unfortunately, there's still a pervasive "of course your data is structured" mindset that even the most modern coding platforms impose that may not be a core approach by the time that anyone learning coding now in K-12 gets to doing actual code work, should that be where they end up.

From Greg Caws

Things you need for the company representative:

1. They need to have coded
2. They need to be raising or have raised kids in BC
3. They need to know about training or teaching
4. It would be preferred if they knew about how to teach instructors

There are two people that come to mind immediately:

s.13,s.22

s.13,s.22

C. Companies to consider in order of preference:

1. BCIC (Dean Prelazzi would be our representative and he has worked with BC Gov't committees) dprelazzi@bcic.ca
2. MacDonald Dettwiler
3. Hootsuite
4. Slack
5. Global Relay
6. Bench

s.13,s.22

Another person who you might want to consider is s.13,s.22
s.13,s.22

s.13,s.22

Seward, Myrna EDUC:EX

From: Winkelmans, Tim EDUC:EX
Sent: Monday, March 14, 2016 5:14 PM
To: Coad, Jeremy A MTIC:EX; Morel, David P MTIC:EX
Subject: FW: Panel questions and reports for Wednesday (Skills Summit) [tomorrow]
Attachments: National Digital Talent Strategy 2020 Executive Summary.pdf; ICTC Leaders in Action Summit Agenda_9March2016_ENGLISH-FINAL.DOCX

Importance: High

I was in Ottawa on Wednesday representing K12 on the Digital Skills Pipeline panel. I'm just back today (was on vacation most of the week) – is it an appropriate item for tomorrow's agenda (or an upcoming meeting?) I've also attached the agenda for the day on Wednesday.

Tim

From: Tanya Woods [mailto:twoods@theesa.ca]
Sent: Tuesday, March 8, 2016 6:29 AM
To: Winkelmans, Tim EDUC:EX; anna.lambert@shopify.com; Kate Arthur; nathalie.verge@ubisoft.com
Cc: Julien Lavoie
Subject: Panel questions and reports for Wednesday (Skills Summit) [tomorrow]
Importance: High

Hello Everyone!

I hope you all had a super weekend. As promised, you can access the 2 reports that have/will be released before our panel discussion here:

1. ESAC Report: http://theesa.ca/resources/playing-for-the-future-2/
2. ICTC Report: the executive summary is attached – the password is: ndts (the full ICTC Report is not yet available to share)

Panel Overview – The Digital Skills Pipeline
Educators, academe, government, community groups and industry all have a critical role to play in developing the workforce of tomorrow. Canada's competitiveness in knowledge industries relies on youth and young workers having early and easy access to the training that will lead to employment and advancement in technology sectors. This panel gathers experts from different parts of the digital skills training pipeline to discuss the initiatives that have had success to date and some of the best practices already developed by the key innovators in this area.

Panelists:
Tim Winkelmans – Director, Graduation, Skills, and Distance Learning | Learning Division - BC Ministry of Education
Anna Lambert - Director of Talent Acquisition, Shopify
Kate Arthur – Kids Code Jeunesse
Nathalie Verge – Ubisoft

Moderator: Tanya Woods, VP Policy & Legal Affairs, Entertainment Software Industry Association of Canada

Questions: Based on our conversation last week, I will let the discussion evolve naturally for the most part, however, to give everyone a chance to contribute I am going to try as ask each of you a question and invite others to comment.

The questions looks something like this:

1) ALL - Please introduce yourselves, where you work, your interest in STE(A)M skills, why this is a matter of importance to you? (ALL – 1-2 minutes/each)
2) KATE, NATHALIE, ANNA - what are the most in-demand skills? (Why are there shortages in talent? What activities are proving successful in upscaling skills? What mechanisms are working to create new digital skills?)
3) NATHALIE – How has industry, and specifically Ubisoft, responded to address the skills gap? (CODEX, etc..)
    a. KATE – How have parents and educators responded?
    b. TIM – How is the BC government responding?
    c. ANNA - How has the talent shortage impacted the growth of Shopify, and how do you deal with it in the short term? Longer term? Are you encouraging or contributing to creating more diversity in STEM fields? If so, how?
4) KATE – What has been the response across Canada to your efforts to raise the level and accessibility of coding for kids?
    a. TIM – What has been the response of the public and teachers to the announcement to include coding in curriculum? Do you think other provinces will follow the lead of BC and NS?
5) KATE, NATHALIE – Do you think KidsCodeJeunesse model and CODEX working? How could it be scaled up? What resources are missing to succeed?
6) ALL – Are stakeholders aligned and working well together writ large?
    a. Where are the gaps?
    b. How can we succeed in making an impact here and creating more alignment?
7) ALL - Do you see a role for the federal government in digital skills formation?
    a. If so, what immediate actions could be taken to make a difference now, going forward?

Really looking forward to seeing you all. If you have any questions or contributions before the event, please let me know.

Have a great day,
Tanya

Tanya Woods
Vice-President, Policy and Legal Affairs | Vice-présidente, Politiques et Affaires juridiques
Entertainment Software Association of Canada | Association canadienne du logiciel de divertissement

130 Spadina Ave. Suite 408 | Toronto, ON M5V 2L4
613-293-3774 | twoods@theESA.Ca
Twitter: @ESACanada | www.theESA.Ca

ICTC CTIC

ENTERTAINMENT SOFTWARE ASSOCIATION OF CANADA

ASSOCIATION CANADIENNE DU LOGICIEL DE DIVERTISSEMENT

CREATIVE MINDS IN THE SMART ECONOMY

National Leaders in Action Summit on Youth & Education

Barrick Salon (4th floor), Museum of Nature, Ottawa, ON
March 9, 2016 10:30 AM – 4:30 PM

9:45 AM	Registration & Networking
10:30 AM	**Summit Opening (MC)**
10:35 AM	**Summit Welcome** Namir Anani, President and CEO - ICTC Tanya Woods, Vice President, Policy - ESAC
10:45 AM	**Panel 1 – Setting Context – From Education to Jobs** Moderator: Sandra Saric, Vice President – Talent Innovation - ICTC • Paul Thompson, Associate Deputy Minister, Skills and Employment Branch - ESDC • Colin McKay, Head-Public Policy and Government Relations - Google • Mohammad Nejad-Sattary, Senior Director, Technology - Capital One • Marc Seaman, Vice President of Education - Microsoft Canada • Anna Lambert, Director of Talent Acquisition - Shopify
11:40	**Summit Overview (MC)**
11:45 AM	Networking Luncheon Key Address – The Honourable Kirsty Duncan, Minister of Science
1:15 PM	**MC comes back to kick start afternoon**
1:20 PM	**Panel 2 Panel Discussion – The Digital Skills Pipeline** Moderator: Tanya Woods – Vice President, Policy - ESAC • Tim Winkelmans, Director, Graduation, Skills, and Distance Learning | Learning Division - BC Ministry of Education • Dr. Sacha Noukhovitch, Executive Director and Editor-in-Chief - STEM Fellowship, Toronto District School Board • Kate Arthur, Executive Director & Co-Founder - Kids Code Jeunesse • Nathalie Verge, Conseillère principale, Affaires corporatives - Ubisoft
2:15 PM	**Break-out Discussion** Theme: The Present: What's working now? What are your organizations doing?
3:00 PM	Refreshment/Networking Break
3:15 PM	**Break-out Discussion** Theme: The Future: role of government, industry & education
4:00 PM	**Synthesis and Action (MC)**
4:15 PM	CLOSING REMARKS
4:30 PM	Summit Adjourns

Seward, Myrna EDUC:EX

From: Morel, David P MTIC:EX
Sent: Friday, March 4, 2016 7:20 AM
To: Jacobson, John MTIC:EX; Greg Caws
Cc: Coad, Jeremy A MTIC:EX; Butterworth, Kevin MTIC:EX
Subject: s.13
Attachments:

Hi John and Greg

Ministry of Education is putting together an advisory group to work with them on the coding curriculum initiative. s.13
s.13
s.13

Appreciate your thoughts on who should be on this committee. From industry their initial thoughts are:

Technology Industry:

s.13

I am meeting with Bill today and will discuss with him.

David

From: Winkelmans, Tim EDUC:EX
Sent: Friday, March 4, 2016 12:28 AM

Page 158 to/à Page 161

Withheld pursuant to/removed as

s.13

Coding Project - Project Charter v 1.0

Purpose This project is intended to facilitate the implementation of a mandatory codir

Background Approximately 120,000 people work in the technology sector or in tech· in the curriculum is "long overdue" and research has shown the benefits for decades throu curiosity, It has been well known that coding has not been for the sake of becoming progi

s.13

Page 163 to/à Page 166

Withheld pursuant to/removed as

s.13

Seward, Myrna EDUC:EX

From: Dennis Lopes (CELA) <delopes@microsoft.com>
Sent: Tuesday, November 24, 2015 8:27 PM
To: Winkelmans, Tim EDUC:EX
Cc: Sandra Saric; Alexandra Clark (CELA)
Subject: National Digital Talent Strategy

Hi Tim,

s.17

Many thanks,

Dennis

Dennis Lopes
Corporate, External and Legal Affairs | Microsoft Canada Inc.
1950 Meadowvale Blvd., Mississauga, ON L5N 8L9

Office: 289.305.9404 | Mobile: 647.278.0252

Seward, Myrna EDUC:EX

From: Hawkes, Mark EDUC:EX
Sent: Monday, March 14, 2016 10:39 AM
To: Winkelmans, Tim EDUC:EX; Loughran, Tony D AVED:EX
Subject: RE: s.13

Hi, Tony:
s.13

Cheers,

Mark

From: Winkelmans, Tim EDUC:EX
Sent: Monday, March 14, 2016 10:31 AM
To: Loughran, Tony D AVED:EX
Cc: Hawkes, Mark EDUC:EX
Subject: FW: s.13

Hi, Tony
s.13

Thanks, Tony

Tim

Seward, Myrna EDUC:EX

From: Jon Hamlin <jonhamlin@gmail.com>
Sent: Thursday, March 3, 2016 4:08 PM
To: Winkelmans, Tim EDUC:EX
Cc: Hawkes, Mark EDUC:EX; Mike Silverton
Subject: Re: agreement amendment

s.13

On Thu, Mar 3, 2016 at 2:36 PM, Winkelmans, Tim EDUC:EX <Tim.Winkelmans@gov.bc.ca> wrote:
s.13

Sent from my iPhone

On Mar 3, 2016, at 2:17 PM, Hawkes, Mark EDUC:EX
<Mark.Hawkes@gov.bc.ca<mailto:Mark.Hawkes@gov.bc.ca>> wrote:

s.13

Mark

From: Jon Hamlin [mailto:jonhamlin@gmail.com]
Sent: Thursday, March 3, 2016 12:40 PM
To: Hawkes, Mark EDUC:EX
Cc: Mike Silverton; Winkelmans, Tim EDUC:EX
Subject: Re: agreement amendment

Hi Mark,

s.13

What do you think - does my logic compute?

Regards,

Jon

On Thu, Mar 3, 2016 at 12:00 PM, Hawkes, Mark EDUC:EX <Mark.Hawkes@gov.bc.ca<mailto:Mark.Hawkes@gov.bc.ca>> wrote:
Hi, Jon:

s.13

Mark

From: Jon Hamlin [mailto:jonhamlin@gmail.com<mailto:jonhamlin@gmail.com>]
Sent: Wednesday, March 2, 2016 11:56 AM
To: Hawkes, Mark EDUC:EX
Cc: Mike Silverton; Winkelmans, Tim EDUC:EX
Subject: Re: agreement amendment

Thanks Mark,

Sorry for lack of communication but rest assured this is on our radar to get it done and sent back to you.
s.13

We will get this done and sent back to you by Tuesday the 8th at the latest.

Thanks
Jon

On Wed, Mar 2, 2016 at 11:18 AM, Hawkes, Mark EDUC:EX <Mark.Hawkes@gov.bc.ca<mailto:Mark.Hawkes@gov.bc.ca>> wrote:
Hi, Jon and Mike:

s.17

s.13

Amount s.13

s.13

s.13

Amount: s.13

Let me know who at the BCTF I should send the amended agreement to for signing.

Thanks,

Mark

Mark Hawkes
E-Learning Coordinator
Learning Division
BC Ministry of Education
250-217-5567<tel:250-217-5567>

Seward, Myrna EDUC:EX

From: Mark McLaughlin <mma123@sfu.ca>
Sent: Friday, March 4, 2016 11:10 AM
To: Winkelmans, Tim EDUC:EX
Cc: David Paterson; Hawkes, Mark EDUC:EX
Subject: Re: Coding curriculum in schools

Hi Tim,

Thank-you for your reply. We're meeting internally on this early next week and we will get back with a few April dates.

In the interim, is there any information or contact info you can provide us on the Coding pilot projects or Coding Hour projects you conducted over the past year.

regards,
mark

Mark McLaughlin CPA,CA, MBA
Executive Director | Ancillary Services
Simon Fraser University
8888 University Drive | Burnaby BC Canada V5A 1S6
mark_mclaughlin@sfu.ca | O: 778.782.3950 | C: 778.238.3950

From: "Tim EDUC Winkelmans:EX"
To: "Mark McLaughlin"
Cc: "David Paterson" , "Mark EDUC Hawkes:EX"
Sent: Tuesday, 1 March, 2016 12:48:06
Subject: RE: Coding curriculum in schools

Hi, Mark

I would be pleased to meet with you sometime in April. We have a number of fiscal year-end activities and spring vacations to work through first.

Generally, we let districts and schools determine the resources they need to implement curriculum standards- we do not have a central authorization or recommendation system. Within this model, though, we can discuss options and possible strategies.

Can you provide a few dates and times in April when you could meet with us here in Victoria (or by audio or web conference)?

Tim

From: Mark McLaughlin [mailto:mma123@sfu.ca]
Sent: Tuesday, March 1, 2016 11:20 AM
To: Winkelmans, Tim EDUC:EX
Cc: David Paterson
Subject: Coding curriculum in schools

Hi Tim,

In light of your recent announcement to introduce Coding within the school curriculum, we are considering putting together a project with our SFU Faculty of Education, to potentially address some of your needs.

We have an BC-based educational product that is available to us, that is similar to Minecraft in some respects, aimed to promote math, physics and programming.

Within the software, players design, build, and program their own robot creations and run them through a variety of challenges.

The software teaches valuable critical thinking and programming skills in a fun and engaging social sandbox environment.

We believe that the software can be tailored to various age groups based on curriculum needs, and be made available as early as this fall.

We would like the opportunity to discuss your curriculum needs at the earliest opportunity.

Best regards

Mark

Mark McLaughlin CPA,CA, MBA
Executive Director | Ancillary Services
Simon Fraser University
8888 University Drive | Burnaby BC Canada V5A 1S6
mark_mclaughlin@sfu.ca | O: 778.782.3950 | C: 778.238.3950

Page 174

Withheld pursuant to/removed as

s.17

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Mark

Mark McLaughlin CPA,CA, MBA
Executive Director | Ancillary Services
Simon Fraser University
8888 University Drive | Burnaby BC Canada V5A 1S6
mark_mclaughlin@sfu.ca | O: 778.782.3950 | C: 778.238.3950

Vancouver Film School
https://vfs.edu/

https://vfs.edu/programs/game-design

https://vfs.edu/programs/programming

Vizwik
https://vizwik.com

App Camps 4 Girls
http://appcamp4girls.com/

Code.org
http://code.org/learn

Little Codr
http://www.littlecodr.com/

https://prezi.com/60x_au926mas/copy-of-kids-code-jeunesse/

CBC Code Kids documentary
www.codekids.ca

Kids Code Jeunesse

Teaching and Volunteer Materials
kidscodejeunesse.org

For Volunteer Access:
username: volunteer
password: codes@KCJ

For Teacher Access:
username: teacher
password: codes@KCJ

Code Academy

https://www.codecademy.com

Coding Apps

There are a variety of coding apps out there for kids to play around with, but one of the best ones is Hopscotch. It teaches the basics of modern coding language on an Apple iPad system.

You can make your own game on the app so it allows you to understand the building blocks necessary to create one. Also try Alice which teaches object-oriented 3D programming language in a fun way.

Bitsbox

This unique service is based on a monthly subscription that sends you a box that teaches the basics of coding to kids. Bitsbox was created by actual coders and features tons of projects that allow kids to comb through basic to more advanced projects. It's connected to an app on the Bitsbox website, and kids will be able to share the projects they have conquered with their friends.

Java.net

This website has all sorts of project ideas that have to do with Java programming. This is how Minecraft was created. There are literally thousands of projects on this site to explore.

Scratch

Designed by MIT engineering students, the website Scratch will have all sorts of animated projects and games for students to understand code better.

It's mainly for students ages 8-16, so it's not really for the little kids who are just starting school. Used in more than 150 countries in 40 different languages, this is one of the most comprehensive free programs out there to get students excited about modern technology.

Code.org

This is another resourceful website that has many different coding projects available to students and educators. Three of the best ones to try that the kids will like are the Minecraft one, Star Wars: Building a Galaxy With Code, and Code with Anna and Elsa from Frozen.

Code Year

http://codeyear.com/

W3Schools

http://www.w3schools.com/

MIT OpenCourseWare
Introduction to Computer Science and Programming

Learn to Code
iTunes U

Code.org
http://code.org/

Technically Learning
Enabling teachers to inspire and engage students in science, technology, engineering and math.
http://technicallylearning.org/Default.aspx

Swift programming language
https://developer.apple.com/swift/

Elementary Coding
https://sites.google.com/a/scsdk8.org/coding-in-elementary-school/

Ladies Learning Code
Ladies Learning Code

Free Coding Bootcamps
HTML500

Hour of Code
https://code.org/educate/hoc

Misc.
- Kids Learning Code/ Girls Learning Code
-
- Be Like Ada
-
- Actua
- http://www.betakit.com/google-and-actua-launch-codemakers-project-to-change-the-way-canadas-youth-think-about-computer-science-and-technology/
-
- Microsoft Educator Network

Brilliant Labs
Learn to code with Scratch video
http://brilliantlabs.com/articles/learn-to-code-with-scratch-introduction/

Coding Without Computers
http://www.slate.com/articles/technology/future_tense/2014/08/computer_science_unplugged_teaching_computational_thinking_without_computers.html
Tim Bell, New Zealand teacher: Computer Science Unplugged

http://csunplugged.org/

http://littlebinsforlittlehands.com/superhero-computer-coding-game-without-a-computer/

Cheers,

Mark

Mark Hawkes
E-Learning Coordinator
Learning Division
BC Ministry of Education
250-217-5567

Seward, Myrna EDUC:EX

From: Winkelmans, Tim EDUC:EX
Sent: Wednesday, March 2, 2016 8:00 AM
To: Furtado, Angelina MTIC:EX
Subject: Re: s.13

Thursday at 230 works well

Thank you

Sent from my iPhone

On Mar 2, 2016, at 7:40 AM, Furtado, Angelina MTIC:EX <Angelina.Furtado@gov.bc.ca> wrote:

> Hi Tim,
> David is available at the following times for a call this week:
> Thursday after 2:30
> Friday 10:00 onwards but I am trying to schedule a couple meetings while David is on Vancouver so this may change.
>
> Please let me know your availability and I will send a meeting notice.
>
> Thank you,
> **Angie Furtado**
> Phone: 778.698.2332
> Mobile 250.216.7511
>
> **From:** Winkelmans, Tim EDUC:EX
> **Sent:** Tuesday, March 1, 2016 8:49 PM
> **To:** Morel, David P MTIC:EX
> **Cc:** McCrea, Jennifer EDUC:EX; Furtado, Angelina MTIC:EX
> **Subject:** RE s.13
> Thanks, David
>
> **From:** Morel, David P MTIC:EX
> **Sent:** Tuesday, March 1, 2016 8:36 PM
> **To:** Winkelmans, Tim EDUC:EX
> **Cc:** McCrea, Jennifer EDUC:EX; Furtado, Angelina MTIC:EX
> **Subject:** RE s.13
> Sorry time just seeing this now. Was tied up in Ministers office most of late afternoon. I am in fairly free Thursday/ Friday so Angie should be able to set up call. I also have a call booked with Jennifer for a call tomorrow AM.
> David
>
> **From:** Winkelmans, Tim EDUC:EX
> **Sent:** Tuesday, March 1, 2016 1:28 PM
> **To:** Morel, David P MTIC:EX
> **Cc:** McCrea, Jennifer EDUC:EX
> **Subject:** s.13
> Good afternoon, David

s.13

s.17 Your calendar looks solid, except for 4:30 this afternoon.
I'm away from the office tomorrow and next week, but wondering if you have suggestions for a time to talk later today, Thursday, or Friday.
Thank you
Tim

Seward, Myrna EDUC:EX

From: Winkelmans, Tim EDUC:EX
Sent: Monday, March 14, 2016 9:33 AM
To: Morel, David P MTIC:EX
Subject: RE: s.13

Thanks, David

These are helpful. Lighthouse Labs was on our list, and I talked with their president at the summit in January.

From: Morel, David P MTIC:EX
Sent: Monday, March 14, 2016 8:56 AM
To: Winkelmans, Tim EDUC:EX
Cc: McCrea, Jennifer EDUC:EX
Subject: RE s.13

Good Morning Tim

s.13

David Morel

From: Winkelmans, Tim EDUC:EX
Sent: Friday, March 4, 2016 12:28 AM
To: Morel, David P MTIC:EX
Subject: s.13

Hi, David
s.13

Tim

Seward, Myrna EDUC:EX

From: Greg Caws <gcaws@bcic.ca>
Sent: Friday, March 4, 2016 12:33 PM
To: Morel, David P MTIC:EX; Jacobson, John MTIC:EX
Cc: Coad, Jeremy A MTIC:EX; Butterworth, Kevin MTIC:EX
Subject: Re: s.13

Things you need for the company representative:

1. They need to have coded
2. They need to be raising or have raised kids in BC
3. They need to know about training or teaching
4. It would be preferred if they knew about how to teach instructors

There are two people that come to mind immediately:

s.22

I'll try and find others.

Greg

From: "Morel, David P MEM:EX" <David.Morel@gov.bc.ca>
Date: Friday, March 4, 2016 at 7:19 AM
To: "Jacobson, John MTIC:EX" <John.Jacobson@gov.bc.ca>, Greg Caws <gcaws@bcic.ca>
Cc: "Coad, Jeremy A MTIC:EX" <Jeremy.Coad@gov.bc.ca>, "Butterworth, Kevin MTIC:EX" <Kevin.Butterworth@gov.bc.ca>
Subject: FW: s.13

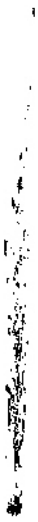
Hi John and Greg
s.13

s.13

I am meeting with Bill today and will discuss with him.
David

From: Winkelmans, Tim EDUC:EX
Sent: Friday, March 4, 2016 12:28 AM
To: Morel, David P MTIC:EX
Subject: s.13
Hi, David
s.13

Tim



Seward, Myrna EDUC:EX

From: Greg Caws <gcaws@bcic.ca>
Sent: Monday, March 7, 2016 9:03 AM
To: Morel, David P MTIC:EX; Jacobson, John MTIC:EX
Cc: Coad, Jeremy A MTIC:EX; Butterworth, Kevin MTIC:EX; Dean Prelazzi
Subject: Res.13

Hi David,

We've had some further thought and have come up with the following:

A. Per my last email:

Things you need for the company representative:

1. They need to have coded
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s.22

C. Companies to consider in order of preference:

1. BCIC (Dean Prelazzi would be our representative and he has worked with BC Gov't committees) dprelazzi@bcic.ca
2. MacDonald Dettwiler
3. Hootsuite
4. Slack
5. Global Relay
6. Bench

Greg

Greg Caws
President and CEO
BCIC
BC Innovation Council
Blog | Twitter | Facebook
604.602.5259
www.bcic.ca

From: "Morel, David P MEM:EX" <David.Morel@gov.bc.ca>
Date: Friday, March 4, 2016 at 7:19 AM
To: "Jacobson, John MTIC:EX" <John.Jacobson@gov.bc.ca>, Greg Caws <gcaws@bcic.ca>
Cc: "Coad, Jeremy A MTIC:EX" <Jeremy.Coad@gov.bc.ca>, "Butterworth, Kevin MTIC:EX" <Kevin.Butterworth@gov.bc.ca>
Subject: FW: s.13

Hi John and Greg
s.13

From: Winkelmans, Tim EDUC:EX
Sent: Friday, March 4, 2016 12:28 AM
To: Morel, David P MTIC:EX
Subject: s.13
Hi, David

Page 186

Withheld pursuant to/removed as

s.13

Seward, Myrna EDUC:EX

From: Jacobson, John MTIC:EX
Sent: Monday, March 7, 2016 9:27 AM
To: Greg Caws; Morel, David P MTIC:EX
Cc: Coad, Jeremy A MTIC:EX; Butterworth, Kevin MTIC:EX; Dean Prelazzi
Subject: RE s.13

The educational experience needs to provide perspective more than skills, in my view. In looking at the list of industry companies, I'd suggest adding either Phemi or Vizier – both are "big data" (structure-free data) analytics companies. For young people, "coding" should be about the thought process of getting computers to do what they want, unconstrained by the limitations imposed by today's fashions. Unfortunately, there's still a pervasive "of course your data is structured" mindset that even the most modern coding platforms impose that may not be a core approach by the time that anyone learning coding now in K-12 gets to doing actual code work, should that be where they end up.

From: Greg Caws [mailto:gcaws@bcic.ca]
Sent: Monday, March 7, 2016 9:03 AM
To: Morel, David P MTIC:EX; Jacobson, John MTIC:EX
Cc: Coad, Jeremy A MTIC:EX; Butterworth, Kevin MTIC:EX; Dean Prelazzi
Subject: Re: s.13

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There are two people that come to mind immediately:
s.22

s.22

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2. MacDonald Dettwiler
3. Hootsuite
4. Slack
5. Global Relay
6. Bench

Greg

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President and CEO
BCIC
BC Innovation Council
Blog | Twitter | Facebook
604.602.5259
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From: "Morel, David P MEM:EX" <David.Morel@gov.bc.ca>
Date: Friday, March 4, 2016 at 7:19 AM
To: "Jacobson, John MTIC:EX" <John.Jacobson@gov.bc.ca>, Greg Caws <gcaws@bcic.ca>
Cc: "Coad, Jeremy A MTIC:EX" <Jeremy.Coad@gov.bc.ca>, "Butterworth, Kevin MTIC:EX" <Kevin.Butterworth@gov.bc.ca>
Subject: FW: Terms of Reference- K12 Coding Advisory Committee

Hi John and Greg

s.13

s.13

I am meeting with Bill today and will discuss with him.

David

From: Winkelmans, Tim EDUC:EX
Sent: Friday, March 4, 2016 12:28 AM
To: Morel, David P MTIC:EX
Subject: s.13

Hi, David
s.13

Tim

ADVICE TO MINISTER
ESTIMATES NOTE
2016

DRAFT

ISSUE: TECHNOLOGY/CODING

ADVICE AND RECOMMENDED RESPONSE:

- **In the #BCTECH strategy, the Ministry of Education's commitments support the Talent pillar.**

- **In particular, the Ministry committed that every student will have the opportunity to learn coding by the end of Grade 9, as part of computational thinking.**

- **Additional commitments include:**
  - **implementing new K-12 curricula in science, math, careers, and applied skills (Applied Design, Skills, and Technologies);**
  - **promoting creative thinking across the curriculum;**
  - **providing more work experience and dual credit opportunities in the information technology sector; and**
  - **completing the Next Generation Network.**

SECONDARY MESSAGES:

- **In December 2015 /January 2016, over 400 students participated in youth coding camps in Victoria, Prince George, Vancouver, and Kelowna for the international Hour of Code event. Industry partners organized these events under the CodeCreate banner. The Ministry provide support funding for these camps.**

- **The Ministry has also funded the Computer Using Educators of BC (CUEBC) to develop an online coding resource guide for teachers.**

CURRENT STATUS:

- The new computational thinking standards for K-9 take effect in September 2016.

- Shoulder tapper agreements with districts include providing support for coding and information technology career paths.

- The Ministry is developing strategies to provide even more support for implementing coding.

- The Ministry is creating an advisory committee with industry, post-secondary, K-12, and non-profit sector representation.

KEY FACTS REGARDING THE ISSUE:

s.13

- In May 2015, the Ministry completed its Career Zones resource for Information and Communications Technology careers.
- s.13

Contact: Tim Winkelmans 250-217-6643
File Created: February 5, 2016
File Updated:
File Location:

SIGN OFF:

Program	Comm. Director	ADM	DM
TW			

ADVICE TO MINISTER
ESTIMATES NOTE
2016

DRAFT REVISED FEB 26 AS PER JM REVIEW FEEDBACK (TW TO PROVIDE ADDL INFO TO ADDRESS JM'S HIGHLIGHTED NOTES ON REVIEWED COPY

ISSUE: TECHNOLOGY/CODING

ADVICE AND RECOMMENDED RESPONSE:

- **The technology sector supports the BC economy at its very foundation and is a key driver of growth for our economy.**
- **To support this growth, starting in December with the announcement of the $100 million BC Tech Fund, Government has released the #BCTECH Strategy.**
- **The #BCTECH Strategy is the culmination of extensive engagement with BC's technology sector and is a key component of the *BC Jobs Plan.***
- **Talent development needs to start in our schools – so students will have an opportunity to learn the basics of coding.**
- **In the new Applied Design, Skills, and Technologies curriculum, every student will have the opportunity to do coding by the end of Grade 9.**
- **In the #BCTech strategy, the Ministry of Education also committed to:**
  - **Support coding events such as the Hour of Code, under the CodeCreate banner;**
  - **Complete Next Generation Network implementation by December 2016; and**
  - **Support more work experience and dual credit opportunities for students in the tech sector.**

SECONDARY MESSAGES:

- **Coding is part of the computational thinking category in the new curriculum, now available on the curriculum website.**
- **The Ministry supported the technology industry to offer 4 CodeCreate events in December 2015 and January 2016 in Vancouver, Victoria, Prince George, and Kelowna.**
  - **400 students participated in these 4 events**

- **Hundreds more were involved with other Hour of Code activities**

- **A an online coding resource guide for teachers is being developed in partnership with the British Columbia Teachers' Federation (BCTF)**

s.13

CURRENT STATUS:

s.13

Contact: Tim Winkelmans, Director
Graduation, Skills & Distance Learning
Phone: 250-217-6643

File Created: Feb 20 2016
File Updated: Feb 26 2016
File Location:

SIGN OFF:

Program	Comm. Director	ADM	DM
Tim Winkelmans		Jennifer McCrea	

NEWS RELEASE

For Immediate Release
2016EDUC0028-000304
March 5, 2016

Ministry of Education

Grants connect students with training for jobs of tomorrow

VANCOUVER – British Columbia students will get a bit of help to give them an opportunity to connect with skills, technical and trades training opportunities, thanks to $170,000 in Skills Training Access Grants that are going to school districts across B.C.

The Ministry of Education is providing 30 public school districts each with a $5,000 grant to help them develop opportunities to support students who want to pursue skills and trades training and career development. The ministry is also providing nine independent schools with grants worth $20,000 in total.

The grants can be used for the 2015-16 school year to help pay for:

- Relocating students to communities with greater training opportunities;
- Student's room and board, tools, books or work clothes;
- Bringing a mobile training unit to a school;
- Operating small skills training classes; and
- Transportation to work experience or apprenticeship placements.

The program is expanding this year to include the Information and Communications Technologies (ICT) sector, such as coding, and to make all school districts and independent schools – not just rural districts – eligible to apply.

To date, almost 560 students have benefited from grants. School districts also reported improvements to skills training, stronger relationships with post-secondary and training providers, and strengthened relationships with employers, as students are more work-ready.

The Skills Training Access Grant supports B.C.'s Skills for Jobs Blueprint, a plan for re-engineering the province's education and training systems - from kindergarten through to post-secondary training and beyond - to ensure students have a full range of training options and are first in line for the careers of tomorrow.

Quotes:

Mike Bernier, Minister of Education –

"Students will reap the benefits of the investment we are able to make in Skills Training Access Grants that are due to our balanced budget and strong fiscal management. These grants will help students access the training, skills and work experience they need to reach their career goals and secure long-term job security in B.C.'s growing economy."

Cameron Olsen, ACE IT student, Grade 11, Nakusp Secondary –

“The skills access grant allowed me to take an ACE IT carpentry program right at home in my own community. Without the support of the grant and my school district, I would have had to travel over 150 kilometres away, which is just not feasible when you live in a small, rural community.

“It also helped me have access to tools that our school didn’t have before the grant — and we really needed new tools!

“I learned lots about gable and hip roofs and I used that learning when I was contracted to build a doghouse for one of my work friends. I used mathematics to help work out roofing angles. The program inspired me to learn more mathematics. I found I really enjoyed the challenge!”

Terry Taylor, superintendent, Arrow Lakes school district–

“Last year we focused on offering ACE IT carpentry pre-apprenticeships to a small group of students and enhanced tools in our secondary shops for the larger group of students. The grant really made a difference to our learners and increased post-secondary pathways and career choices.

“This year, we are focussed on enhancing coding and electronics learning for our students. Skills Access grants help us broaden innovative practices in our district to better meet the needs of more and more of our learners!”

Quick Facts:

- Skills Training Access Grants launched in March 2015.
- The grant may be used during the 2015-16 school year.
- Districts are required to report to the ministry the immediate and long-term benefits to local students.
- B.C. will have nearly one million job openings due to retirements and economic growth by 2024.
- Based on the B.C. 2024 Labour Market Outlook, 68% of job openings will be due to retirements and 32% of job openings will be due to economic growth.
- The Accelerated Credit Enrolment in Industry Training (ACE IT) program is the in-class component of a high school apprenticeship. ACE IT students are youth apprentices registered with the Industry Training Authority.

Learn More:

B.C.’s Skills for Jobs Blueprint: : https://www.workbc.ca/Training-Education/B-C-s-Skills-for-Jobs-Blueprint.aspx

BC Jobs Plan: http://engage.gov.bc.ca/bcjobsplan/

Industry Training Authority: http://www.itabc.ca/

Labour Market Outlook reports: https://www.workbc.ca/Labour-Market-Information/B-C-s-Economy/Reports.aspx

ACE IT program: http://www2.gov.bc.ca/gov/content/education-training/k-12/support/graduation/getting-credit-to-graduate/career-and-skills-training/apprenticeship-

and-trades/ace-it

Media Contact:

Government Communications and Public
Engagement
Ministry of Education
250 356-5963

Connect with the Province of B.C. at: www.gov.bc.ca/connect

BACKGROUNDER

For Immediate Release
2016EDUC0028-000304
March 5, 2016

Ministry of Education

Students get more help from new training grant

The Government of B.C. has awarded 30 public school districts and nine independent schools with $170,000 in Skills Training Access Grants.

Each of the public school districts is receiving $5,000. There are varying amounts of funding allocated for independent schools.

The approved grants for independent schools are as follows:

- Pacific School of Innovation and Inquiry, Victoria - $2,500
- Cedars Christian School, Prince George - $2,500
- Artemis Place Secondary School, Victoria - $2,500
- Westside Academy, Prince George - $2,500
- Abbotsford Christian School, Abbotsford - $2,000
- Chalo School, Fort Nelson - $2,000
- Credo Christian School, Langley - $2,000
- Ebenezer Canadian Reformed School, Smithers - $2,000
- Mediated Learning Academy, Coquitlam- $2,000

The approved grants for public school districts are as follows:

- School District 5 - Southeast Kootenay
- School District 6 - Rocky Mountain
- School District 10 - Arrow Lakes
- School District 19 - Revelstoke
- School District 20 - Kootenay-Columbia
- School District 28 - Quesnel
- School District 38 - Richmond
- School District 41 - Burnaby
- School District 43 - Coquitlam
- School District 44 - North Vancouver
- School District 46 - Sunshine Coast
- School District 47 - Powell River
- School District 48 - Sea to Sky
- School District 51 - Boundary
- School District 52 - Prince Rupert
- School District 53 - Okanagan Similkameen
- School District 54 - Bulkley Valley
- School District 57 - Prince George
- School District 59 - Peace River South

- School District 60 - Peace River North
- School District 61 - Greater Victoria
- School District 63 - Saanich
- School District 64 - Gulf Islands
- School District 69 - Qualicum
- School District 73 - Kamloops/Thompson
- School District 74 - Gold Trail
- School District 78 - Fraser-Cascade
- School District 81 - Fort Nelson
- School District 83 - North Okanagan-Shuswap
- School District 84 - Vancouver Island West

Media Contact:

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Computational Thinking and Coding Implementation Readiness Environmental Scan

Background

The ICT component of the new Applied Design, Skills and Technologies curriculum includes **Computational Thinking** and **Coding**. Computational Thinking is a cognitive or thought process involving logical reasoning by which problems are solved and artefacts, procedures and systems are better understood. It includes the ability to think algorithmically, in terms of decomposition, in generalisations, identifying and making use of patterns, in abstractions, choosing good representations, and in terms of evaluation.

Coding involves the translating of the design of a computer system into code form and evaluating it to ensure that it functions correctly under all anticipated conditions. Debugging is the systematic application of analysis and evaluation using skills such as testing, tracing, and logical thinking to predict and verify outcomes.

Grades K-5:
BC's **Digital Literacy Framework** offers teachers descriptions of the types of knowledge and skills students at this level should have to be considered digitally literate. Also, the revised Mathematics K-5 curriculum emphasizes computational thinking-related skills such as reasoning, analyzing, and recognizing patterns.

Grades 6/7:
Students are expected to know the following:

Computational Thinking

- simple algorithms that reflect computational thinking
- visual representations of problems and data
- evolution of programming languages
- visual programming

Grade 8:
Students are expected to know the following:

Computational Thinking

- software programs as specific and sequential instructions with algorithms that can be reliably repeated by others
- debugging algorithms and programs by breaking problems down into a series of sub problems
- binary number system (1s and 0s) to represent data programming languages, including visual
- programming in relation to text-based programming and programming modular components

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Grade 9:

Students are expected to know the following:

Information and Communications Technologies

- text-based coding
- binary representation of various data types, including text, sound, pictures, video
- drag-and-drop mobile development
- programming modular components

The Grade 10-12 ADST curricula are still under development, but the ICT component will include curriculum standards, competencies and content related to computational thinking, digital literacy, and computer programming. Locally and externally developed courses in these areas, as well as industry certifications, will continue to be an option for districts and students.

Instructions: Please complete and return in Word format to: Mark.Hawkes@gov.bc.ca

School District Name and Number: _____

1. Curriculum and Teacher Development

Question	Educator Readiness (Indicate with an "X" in the appropriate box.)				
	None	Minority	Half	Majority	All
1. Number of K-5 educators ready to integrate computational thinking into teaching practice					
2. Number of Grade 6/7 educators ready to integrate computational thinking into teaching practice					
3. Number of Grade 8-9 ADST (ICT) educators in your district are ready to integrate computational thinking and text-based coding into their teaching practice?					

4. What professional learning/teacher training opportunities in the area of computational thinking and coding currently exist in your district?
(Answer space)

5. What new District teacher development supports are planned in your district to help implement the new curriculum?
(Answer space)

6. What Ministry-provided curriculum and teacher development supports would help in this area?
(Answer space)

2. Infrastructure

NOTE: Next Generation Network upgrades will be complete by the end of 2016.

Question	Infrastructure (Indicate with an "X" in the appropriate box.)			
	Not Able	Somewhat Able	Able	More than Able
1. **Access to computers for students within your district/schools is adequate in terms of:**				
Accessibility:				
Quantity :				
Availability:				
2. **How able is your district's existing computer hardware to meet the requirements of the new ADST curriculum?**				

Question	Infrastructure (Indicate with an "X" in the appropriate box.)	
	Yes	No
3. **Access to computers for students within your district/schools is adequate in terms of:**		
Elementary:		
Middle Secondary:		
4. **Do you have a Bring Your Own Device" (BYOD) policy?**		

Question	Infrastructure (Indicate with an "X" in the appropriate box.)			
	Not Able	Somewhat Able	Able	More than Able
5. **How able is your in school infrastructure able to meet the requirements of the new ADST curriculum?**				
Local area or wired network:				

Elementary:				
Middle:				
Secondary:				
Wireless access within schools:				
Elementary:				
Middle:				
Secondary:				

6. **Is the District adding any infrastructure supports to help implement the new curriculum over the next 1-2 years? Please provide describe your plans and infrastructure to be upgraded:**
(Answer space)

1. Learning Resources

Question	**Learning Resources** (Indicate with an "X" in the appropriate box.)			
	Not Suitable	Somewhat Suitable	Suitable	More than Suitable
1. How suitable are your district's teacher resources to meet the requirements of the new ADST curriculum?				
2. How suitable are your district's student learning resources to meet the requirements of the new ADST curriculum?				

3. What new District level teacher resources are planned to help implement the new curriculum?
(Answer space)

4. What new District student learning resources are planned to help implement the new curriculum?
(Answer space)

5. What Ministry-provided learning resource supports would help in this area?
(Answer space)

2. Organization for Learning

Question	Organization for Learning (Indicate with an "X" in the appropriate box.)				
	Not Well	Somewhat	Satisfactorily	Well	Very Well
1. How well is your district organized to deliver the new ADST curriculum? (e.g.: team teaching, class rotations, Maker spaces, district coordinators, timetable)					

2. What new District organizational strategies are planned to help implement the new curriculum?
(Answer space)

3. What Ministry-provided organizational supports would help in this area?
(Answer space)

Strategy Rating

Please rate the value of the following potential implementation strategies on a scale from 1-10. (type your score in the box provided for each item):

1. Post-secondary recognition of a revised, more rigorous Computer Science 12 course	
2. Teacher in-service: coding workshops in partnership with industry and post-secondary	
3. Pre-service teacher coding workshops in partnership with Teacher Regulation Branch, BC Teachers' Council, industry and post-secondary	
4. Comprehensive, online, coding resource toolkit to support coding implementation	
5. Distance Learning coding module in partnership with the DL Consortium and Open School BC	

1. What else would you like to tell the Ministry about implementing computational thinking and coding?
(Answer space)

February 22, 2016

Ref: 186248

All Superintendents of Schools

Dear Colleagues:

Re: Computational Thinking and Coding Implementation Readiness: Environmental Scan

As part of the BC Technology Strategy announced by Premier Christy Clark on January 18 2016, the new Applied Design, Skills and Technologies (ADST) curriculum for K-9 will give British Columbia students an opportunity to learn computational thinking skills and experience coding.

In preparation for the implementation of the redesigned curriculum next September, and the Grade 10-12 curriculum the following year, the Ministry would like to develop a better understanding of district, school and teacher readiness.

The attached survey is intended to be completed by whichever individual in your district has the best sense of the level of this readiness. The survey asks questions in the areas of infrastructure, teacher development, learning resources, and district organization. The information obtained through the survey will inform the Ministry on how we might best support the system.

The survey is a word document and should be completed and emailed to Mark.Hawkes@gov.bc.ca by March 4, 2016.

Thank you for assisting us in this process.

Sincerely,

Jennifer McCrea
Assistant Deputy Minister, Learning
Sector Liaison and Student Safety

Attachment

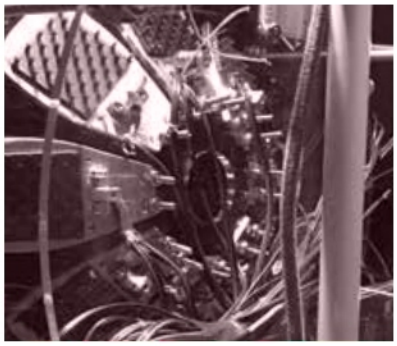
Ministry of Education | Learning Division
Mailing Address: PO Box 9887 Stn Prov Govt Victoria BC V8W 9T6
Location: 620 Superior St Victoria BC

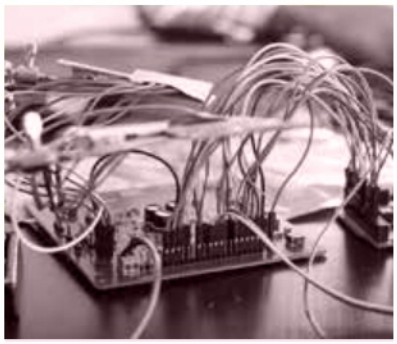
The #BCTECH Strategy 2016

CANADA STARTS HERE

BC JOBS PLAN

Contents





Message from the ***Premier***

British Columbians can feel proud of the technology ecosystem we have built here over the past several years.

The technology sector has become a major engine of economic growth in British Columbia, and is one of the eight key sectors identified in the *BC Jobs Plan*. The sector is a crucial job creator, and supports innovation and productivity across all industries.

Fostering the growth of a flourishing technology sector and the commercialization of its products and services is a principal priority for the B.C. Government. The *#BCTECH Strategy* supports British Columbians who are building profitable, competitive companies, and creating high-paying, skilled jobs.

Through our investment in venture capital, tax incentives, and low tax rates, we are creating an environment conducive to the creation of tech companies, and rich enough in capital and talent to give them the best opportunity to become large, anchor companies here in the province.

Through curriculum initiatives, streamlined immigration, and applied learning programs, we want to ensure that talent is available for B.C. tech companies to compete, and all British Columbians are prepared to thrive in an economy in which every sector is enhanced by technology.

All British Columbians stand to benefit from a technology sector that is fulfilling its potential, and the *#BCTECH Strategy* is designed to help the sector do just that.

The Honourable Christy Clark
Premier of British Columbia

"The **TECHNOLOGY SECTOR** has become a major engine of economic growth in British Columbia."

Message from the ***Minister***

The *#BCTECH Strategy* represents a vision for the province.

The *#BCTECH Strategy* is future-proofing the province. It is an investment in the economy and our youth. The result will be high-paying jobs and students prepared to thrive.

British Columbia's tech sector is crucial in keeping B.C. competitive in the global market. A tech sector with the tools to grow is good business for everyone.

British Columbia is a tech-driven economy. The various technology subsectors – information and communications technology, cleantech, engineering, life sciences, and digital media – have a foothold in B.C., and have witnessed remarkable success stories. The symbiotic relationship between the tech sector and B.C.'s resources sector is resulting in technology adoption and productivity gains that will continue to reinforce and grow our already diverse and vibrant economy.

The *#BCTECH Strategy* is a renewal of our commitment to the technology sector. We have previously invested in the B.C. Knowledge Development Fund, Genome BC, the Michael Smith Foundation for Health Research, BC Innovation Council, Mitacs, and the B.C. Renaissance Capital Fund, to name just a few.

Those investments are working and contributing to the growth of our tech sector. We are going to keep investing and developing a premiere tech ecosystem, preparing our youth to prosper, and realize a greater number of large technology companies founded by skilled and motivated British Columbians.

"The **#BCTECH** Strategy is a renewal of our commitment to the technology sector."

Honourable Amrik Virk
Minister of Technology, Innovation and Citizens' Services

#BCTECH Strategy

The **#BCTECH** Strategy

Sierra Wireless is at the leading edge of the Internet of Things. D-Wave is breaking ground in quantum computing, selling to Google and NASA. Kairos Therapeutics is tackling cancer by combining antibodies with drugs. General Fusion is researching the production of clean energy from fusion.

All of this is happening in British Columbia. It's a solid foundation. It's gaining momentum.

The B.C. tech sector has come into its own.

The entrepreneurial drive in B.C. has created tech companies with nine-figure revenues, a vibrant startup ecosystem, and world-class technology used by the most prestigious companies in finance, information technology, aerospace, and retail.

The tech sector is a key driver of growth for the provincial economy, expanding faster than the economy at large. Employing over 86,000 people, with an average wage that is 60% higher than B.C.'s industrial average, the sector has a principal role in the *BC Jobs Plan*.[1] The tech sector has outpaced the overall provincial economy for eight of the past ten years. The 9,000 technology companies[2] in British Columbia in 2013 combined to generate over $23 billion in revenue[3], adding over $13 billion to B.C.'s GDP. That same year, over 700 new technology companies came into existence in the province.[4]

We have clear advantages over other jurisdictions. We have the '3 Ts': **Talent, Taxes, and Time Zone**.

We have a 10% provincial and 25% combined provincial and federal corporate tax rate, and tax credits to support tech investment. We have esteemed, science-focused universities that produce a highly educated workforce. We have a location that guarantees smooth co-ordination with partners and customers on the West Coast.

These strengths, our promotion of tech-sector growth, and our success stories are multiplying and attracting large multinational companies like Amazon, Sony Pictures Imageworks, Microsoft, Electronic Arts, and Animal Logic to set up in the province.

1 BC Stats, Profile of the British Columbia High Technology Sector, 2014 Edition (June 2015), pg. 4

2 BC Stats, Profile of the British Columbia High Technology Sector, 2014 Edition (June 2015), pg. 58

3 BC Stats, Profile of the British Columbia High Technology Sector, 2014 Edition (June 2015), pg. 4

4 BC Stats, Profile of the British Columbia High Technology Sector, 2014 Edition (June 2015), pg. 4

We're committed to building on this progress. Government has a role to play in expediting growth and seeding success stories, while supporting entrepreneurs who have the vision, ambition, and passion to build technology, commercialize it, and reach every market in need of solutions.

Tech companies told us that B.C. needs more talent. We're creating avenues for more skilled and talented people to work in the tech sector.

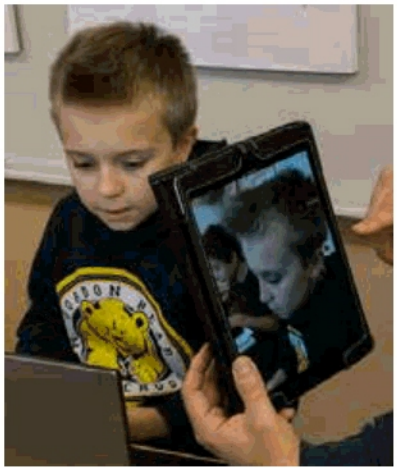
Entrepreneurs said they need capital. We're investing **$100 million** in a venture capital initiative.

Industry stated they need less friction to sell to government. We've revamped the process.

As the tech sector continues to emerge, it keeps the province's economy diverse, strong, and growing. B.C. needs more homegrown tech companies to grow from small operations with viable products to growth stage companies exporting around the world, employing some of the province's most educated, creative, and skilled people, with British Columbians at the helm.

We're positioning the province for the future. We're building the venture capital needed for growth. We're preparing today's students for prosperity.

In the *#BCTECH Strategy*, we're doing this through actions in three pillars: **CAPITAL, TALENT,** and **MARKETS.**



Outcomes

These investments in capital, in cultivating talent, and in accessing markets support the vision to grow the average size of tech companies, and raise overall employment and revenue in the technology sector.

The tech community in B.C. has proven that our **tech companies** across all verticals can **thrive on a global level.**

The *#BCTECH Strategy* builds on our strengths and previous investments, and supports a vibrant and flourishing tech ecosystem with skilled, ambitious, and creative British Columbians leading the growth.

Photo courtesy of: Ladies Learning Code

Capital

IMPROVE ACCESS TO CAPITAL AND CONTINUE SUPPORTING OUR COMPETITIVE TAX SYSTEM AND RESEARCH ENVIRONMENT

Access to capital is essential for technology companies to succeed in a competitive global marketplace.

We know that talent, research, customer discovery, and growth all depend on the availability of capital. We want to make sure that early stage companies with viable products, services, or research with great market prospects are not forced to fold or leave the province because of a lack of financing. This is a particular concern for companies in information and communications technology, life sciences, and cleantech.

We want companies to have sufficient access to **local venture capital** in order to realize their **growth potential** in the province.

We need to invest. We've surveyed venture capital best-practices in jurisdictions throughout the world, and we are putting $100 million toward expanding venture capital in British Columbia.

This is not a subsidy. This will be an investment. As an investor, we expect this venture capital to spur commercialization and to grow companies with the potential to provide a significant return to the province in the years ahead.

Early Stage Venture Capital Funding

We are continuing our long history of backing the province's technology sector through investment.

In 2007, we deepened the pool of venture capital in the province with the B.C. Renaissance Capital Fund (BCRCF), a fund of funds now invested in eight private venture capital firms with a particular focus on information technology, digital media, life sciences, and cleantech. The mandate of the BCRCF was straightforward: create economic development and generate superior financial returns.

Of the original funding ($90 million), $69 million has been invested in over 30 companies, contributing to the creation of over a thousand jobs. Beyond this, the fund's capital has been leveraged through co-investment with other funds to the tune of over $308 million, including investment money attracted from outside of the province.

We are investing

$100 million

to expand the availability of **VENTURE CAPITAL in B.C.** *and address the* **early stage (A-round) FUNDING GAP**

Since the fund's establishment in 2007, the landscape of investment and venture capital has changed and so have the funding needs of technology companies. While there continues to be an active angel funding presence in the province and a significant rise in late stage investment, Series A investment has not kept pace.

In the *#BCTECH Strategy*, we envision having a suitable supply of local venture capital aimed at promising early stage companies, drawing outside capital into the province for co-investment.

Following consultation with industry, we are investing $100 million in a new fund to address the Series A funding gap and revitalize early stage venture capital in B.C. – we also recognize the need for access to capital at later stages for continued company growth. The capital will be available to make local investments, to leverage capital from other jurisdictions, and to enable technology companies to commercialize, grow, and prosper in the province.

The venture capital fund initiative will not only address the short term early stage funding gap in B.C., it will also build a stronger venture capital system in the longer term by leveraging capital from other investors and promoting awareness of B.C. as a robust, locally based venture capital system.

Continue our Competitive Tax Rates and Credits

Over and above a low provincial corporate tax rate of 10%, and combined federal and provincial rate of 25%, we have tax incentives for business. We want more tech companies, investors, and entrepreneurs to make use of them.

Unique in Canada, our *Small Business Venture Capital Act* provides provincial income tax credits of up to $33 million each year to persons that invest in shares of a registered venture capital corporation or in an eligible business. These tax credits support investment of up to $110 million annually.

The *Small Business Venture Capital Act* tax credits include the Business Creation Tax Credit, introduced in 2012, which provides up to $3 million in tax credits every year.

This credit supports $10 million invested in businesses that are less than two years old.

We want to increase the number of tech companies utilizing tax credits such as the Digital Animation or Visual Effects (DAVE) credit, a 17.5% tax credit designed to encourage domestic and international productions to hire B.C. talent for digital animation and visual effects projects, and the Interactive Digital Media Tax Credit (IDMTC), which offers a 17.5% tax credit on eligible B.C. labour costs for companies that produce interactive products that educate, inform, or entertain.

Continue to Build a Strong Research Environment in B.C.

The Province recognizes the importance of government investment in a healthy research environment and the opportunities that can arise, and the broad benefits that can accrue, from cutting-edge research.

B.C. has a high-calibre health research environment. This infrastructure leads to breakthroughs in areas like cancer treatment. Through organizations like Genome BC and the Michael Smith Foundation for Health Research, we will continue to attract and keep top research talent, train human capital, build new knowledge and then translate the results of this work into leading health practices.

We also want our entrepreneurs to continue to use federal financial assistance programs, such as the National Research Council's Industrial Research Assistance Program. This program is open to small- and medium-sized companies that plan to grow through the development and commercialization of innovative technology products, services, or processes.

Federal tax credits applicable to B.C. tech companies are also valuable. Meant to encourage scientific and technological innovation, the Scientific Research and Experimental Development Tax Incentive Program (SR&ED) gives Canadian-controlled private corporations an investment tax credit of 35% up to $3 million on qualified expenditures for basic research, applied research, and experimental development.

"...our ***Small Business Venture Capital Act*** provides provincial income tax credits of up to **$33 million** each year..."

Talent

DEEPEN THE B.C. TECHNOLOGY TALENT POOL

A crucial element for the success and competitiveness of any technology company is talent, expertise and experience in technical, business, and senior management roles.

B.C. tech companies need to have access to the **best people**.

We want the best tech talent to emerge from our province, and we're going to give our youth the tools to succeed. There will be greater post-secondary emphasis on technology, as well as wider availability of learning and development programs like government-funded incubators and coding academies. K-12 curricular changes focusing on math, sciences, creativity, and other curricula will develop the fundamental skills needed for careers in technology for 600,000 students over the next 10 years. High school students will also have greater access to Work Experience Electives.

Leveraging the strength of our diversity, British Columbia's inclusive educational institutions help to ensure under-represented groups are supported in pursuing studies that lead to opportunities in the technology sector.

Through streamlined immigration and labour mobility, we'll give companies a better opportunity to attract and bring in highly skilled talent when local supply is tight.

Post-Secondary Support: Raising the Sector's Profile

At the post-secondary level, we want even more success in programming that supports tech careers. We're providing financial aid grants targeted toward post-secondary students in programs that align with the tech sector.

To provide experience, the BC Innovation Council (BCIC) created the B.C. Tech Co-op Grants Program through BCIC Tech Works to provide business and skills training to students and talent to small technology companies.

Employers receive a grant of up to $2,700 covering 25%, or approximately one month, of a student's salary in a typical four month co-op.

Technology companies will benefit from the $450 million we are targeting for post-secondary training leading to in-demand jobs described in *B.C.'s Skills for Jobs Blueprint*. This realignment of funds started two years ago, and in that time,

over **1,000 student spaces** have been secured in tech-related programming.

Funding for further student spaces will be targeted in 2016/17 and 2017/18 for tech-sector related occupations in the Top 100 in-demand careers, ensuring continued access to tech-related education and training by investing in British Columbians to build their talents.

Interested students need better access to labour market information for B.C.'s technology sector. The B.C. Labour Market Outlook, which includes a provincial 10-year forecast of job openings, now prominently features openings for anticipated technology sector occupations based on labour market trends.

Through the Labour Market Partnerships Program, we will support the technology sector to customize labour market information, strategies, and tools that address labour market priorities.

We also want our ambitious students to have the best opportunity to fit the research proficiencies of graduate students with the needs of business. Over the course of two years, the Ministry of Advanced Education will enhance support to Mitacs Accelerate, enabling graduate students and postdoctoral fellows to undertake applied research projects relating to their expertise within industry.

Applied Learning and Entrepreneur Development

To support opportunities for undergraduate and advanced students to gain skills and experience, the provincial government has supported the implementation of advanced research laboratories in British Columbia through grants, support to researchers, funded research projects, and funding for research infrastructure through the B.C. Knowledge Development Fund.

These advanced research laboratories are important engines for the economic development of the province. Attached to B.C. universities, they conduct internationally recognized, leading-edge research, train highly qualified personnel, collaborate with private partners, support local industrial development, generate marketable intellectual property, and create spin off companies. The training offered to graduate students and postdoctoral fellows by these advanced research laboratories in areas such as genomics, nuclear physics, nano-materials, and advanced manufacturing is invaluable.

Examples of B.C.'s advanced research laboratories include :

- *TRIUMF's Advanced Rare IsotopE Laboratory (ARIEL)*, which produces and studies isotopes for physics and medicine;
- *Centre for Drug Research and Development*, which translates commercially promising drug research conducted at B.C. universities into new therapies;
- *FPInnovations*, which accelerates innovation in collaboration with the wood and forest industry;
- *Canada's Michael Smith Genome Science Centre*, which develops and deploys genomics technologies in support of life sciences research;
- *4D LABS*, which offers training and hands-on tool use to industry partners interested in nano-materials; and
- *Vancouver Prostate Centre*, which works to develop new cancer treatments.

These advanced research laboratories contribute to the international reputation of British Columbia as a global leader in developing innovative technologies and offer premium experience and training for advanced students.

We want to enable entrepreneurship wherever possible through partnerships with industry and business incubators. For instance, we will build on the Mechatronics Technology Entrepreneurship Incubator at SFU, in which bright mechatronics and entrepreneurship students combine skills to develop and pitch solutions for the market.

The BC Innovator Skills Initiative is training the next generation of leaders. Students can gain skills and access to a business environment with today's local technology leaders through a BCIC Innovator Skills Initiative Voucher valued up to $7,500, which is matched by a company.

The avenues into tech are not only available to students enrolled in a high school or post-secondary institution. We are creating paths for driven individuals to gain the skills to succeed in the tech sector.

The province will build on the success of the first round of coding academies, which provide accelerated education and a chance at employment in a tech company for those who are interested in a career in web-based services.

Streamlined Immigration and Labour Mobility

We also want B.C. companies to be able to attract skilled workers from across Canada and around the world. We are working with all levels of government to remove barriers to tech talent labour mobility in order to meet today's demand for talent.

Our initiatives streamline immigration pathways to meet the talent requirements of technology companies at all growth stages. The B.C. Provincial Nominee Program and federal immigration pathways will help technology companies that need to recruit workers from outside the province when B.C.'s skilled labour pool has been fully tapped.

We will promote the federal government's Express Entry program for workers with in-demand technology skills, and we're also funding a foreign qualifications recognition project that will help new immigrants fit their skills into alternative, in-demand careers in B.C.'s technology sector.

The Talent Pipeline: Education that Builds Technology Skills

Solutions for talent supply include a curriculum that emphasizes tech-related skills and alignment between our educators and our technology sector.

A stable, long term supply of skilled talent for the technology sector starts with the creation of K-12 curricula building fundamental technical skills.

Once the new curriculum is implemented in 2016/17, **every student will have the opportunity to learn coding** by the end of Grade 9.

An area of study called *Applied Design, Skills, and Technologies* emphasizes familiarity with technology at early ages, and combines concepts from information technology, business, and technology education in later grades.

Additionally, we are supporting student opportunities to learn coding in and out of school through courses and special activities such as the Hour of Code.

We also intend to align our schools and the technology sector, so that students get the best guidance as they prepare to enter the knowledge economy.

In the *#BCTech Strategy*, students and graduates who are planning their careers, both academic and professional, will have informed guidance and full information about career options in tech.

Of course, nothing substitutes for experience. Work integrated learning programs, like co-op or dual credit programs, continue to give high school students the opportunity to get early exposure and experience in a career, while earning both high-school credits and credits toward post-secondary certificates and diplomas.

To incent students to get experience and prepare for the transition from the educational world to the professional one, we are also increasing the number of students earning elective graduation credit for participating in Work Experience Electives in the technology sector.

Markets

MAKE IT EASIER TO ACCESS NEW MARKETS

We are continuing to make it easier to sell to the B.C. Government. If companies are building tech that can improve services delivered by provincial agencies, we want to know about it, and we want these companies to have an opportunity to sell their tech to us.

The *#BCTECH Strategy* includes activities that continue to streamline, simplify and automate government procurement processes, increase access to local and global markets, facilitate exports, invest in connectivity infrastructure, and improve collaboration and commercialization, all with the aim of growing B.C. tech companies.

Making it Easier to Sell to Government

Government procurement can expedite broader commercialization and export. Certain tech subsectors, cleantech in particular, deliberately use the local market as a trial for newly commercialized technology, making adjustments and developing use cases before expanding to other markets.

For instance, one program to increase the demand for cleantech solutions is the Province's legislated Carbon Neutral Government commitment.

Making ministries, K-12 schools, health authorities, public post-secondary institutions, provincial Crown corporations and agencies **carbon neutral spurs the development of cleantech solutions**.

Also, the Ministry of Technology, Innovation and Citizens' Services has a mandate to assist in the development of new technologies that are made in B.C. An engineered cedar siding product from Coulson Manufacturing in Port Alberni matches this description. In order to test the durability of the promising new siding in real-life conditions, government has purchased it and used it as an accent material on five projects.

More broadly, there are a number of activities underway and planned that are designed to enhance the way that the Province of B.C. acquires billions of dollars of goods and services annually. This includes proactively providing information and resources to vendors and introducing technology and tools to automate and streamline the entire procurement process. Modern tools and connecting with industry to discuss opportunities for innovation and partnership will make it easier for the tech sector to sell to government.

We have already begun to make selling to the government as straight forward as possible by introducing a short-form Request for Proposals (SRFP).

Contracts for services under **$250,000** have RFPs that are just two pages. We're **eliminating** unneeded complexity.

Efforts to streamline and simplify procurement processes will continue.

Effective and meaningful engagement with all stakeholders is essential. As an example, the Ministry of Health has recently begun a process to explore with industry how more collaboration can occur in order to develop and scale up innovations that improve population outcomes, and/or increase the productivity and sustainability of the health-care system.

Through investment in the B.C. Developers' Exchange, B.C.'s public sector and the province's software entrepreneurs have a purpose-built channel to collaborate and do business. British Columbia's public sector code, Application Program Interfaces, and data are shared with technology entrepreneurs to bring about new business ideas, provide work through the building of better digital services for the public sector, and streamlined ways for the public sector to buy software innovations.

Sharing Ideas

Also conducive to collaboration is shared work space. The new Okanagan Centre for Innovation will provide this space. Provincial funding of up to $6 million will be provided upon completion of the building in exchange for ownership of a 40-year leasehold strata title for approximately 1,850 square metres (20,000 square feet) of space. The centre will provide low-cost, flexible space for startups who have graduated from the Accelerate Okanagan Venture Acceleration Program and are still at a venture stage. The convenience of being housed in one space to network, share ideas and pass on experience will give them an invaluable boost as they navigate the critical early stage growth period of starting a tech company. Construction is underway and is scheduled for completion in early 2017.

Lastly, the B.C. Government recognizes that unlocking the value of data requires innovation, collaboration and partnership among citizens, researchers, the private sector and government. Whether increasing the responsiveness of government services, improving outcomes for citizens, or supporting tech companies towards a stronger bottom line, modern data access and advanced analytic capabilities are an imperative for the Province. B.C. is a national leader in providing open and accessible data at *www.data.gov.bc.ca*. Looking ahead, the Province has started work to identify specific examples of where access to data across and within public sectors can be united in ways to improve public policy and programs, and inform next steps for increasing data available to B.C. companies to boost economic growth.

Make B.C. the Most Connected Province

The opportunity to create a successful company and reach local and international markets is open to ambitious people in any location in the province. Inspiring examples like Hy-Tech Drilling in Smithers with its innovative Tech 5000 drill and Cloudhead Games in Coombs with its work in virtual reality are indicators of what

aspiring B.C. **entrepreneurs can achieve** from outside major cities.

Apart from the entrepreneurial spirit and a working business model, these entrepreneurs need excellent infrastructure to adopt technology and access markets. That's why this government has committed to providing high-speed Internet access to 100% of the province by 2021.

Facilitating Business Growth through Exports

International trade allows B.C. tech companies to expand their revenue and workforce as they access a global market for their products. In 2013, just under 30% of total high tech goods manufactured in B.C. were exported[1] and the sector exports far more services than goods.[2]

To facilitate the technology sector's overall ability to export, we will make it easier to find and use services offered by government that equip businesses to expand and sell to new markets. We will also develop Sector Investment and Export Plans for life sciences, cleantech, ICT, and digital media, to improve competitiveness.

Encouraging Commercialization

Exciting developments in the commercialization of cleantech research are happening in the province. Evok Innovations, created by leading Western Canadian oil and gas companies and the B.C. Cleantech CEO Alliance, is a non-profit $100-million cleantech investment fund and accelerator.

The accelerator combines the oil, gas, and **technical expertise** that exist in British Columbia and Alberta to identify, finance, and accelerate new **cleantech solutions**.

For our part, with an aim to spur adoption of cleantech and achieve world-leading performance in greenhouse gas intensity, we have introduced legislation to incent investment in emissions reduction projects in the natural gas and other sectors in B.C., which provides the potential to fund the development of innovative clean technologies with significant potential to reduce B.C.'s long term emissions.

We are also supporting programs that connect aspiring entrepreneurs with mentors, plug them into an active network, and educate them on commercialization. Through various programs and initiatives, the BC Innovation Council (BCIC) is accomplishing its mission of strengthening British Columbia by accelerating the growth of B.C. ventures through support for entrepreneurs and technology startups.

1 BC Stats, Profile of the British Columbia High Technology Sector, 2014 Edition (June 2015), pg. 30

2 BC Stats, Profile of the British Columbia High Technology Sector, 2014 Edition (June 2015), pg. 40

For instance, the BCIC hosts the Venture Acceleration Program in regions throughout B.C. The initiative assists small technology companies to assess and develop revenue growth opportunities. They also sponsor Launch Academy, a program that supports entrepreneurs with access to mentorship, education, and networking opportunities as they search for repeatable and scalable business models. In another example, the BCIC has partnered with the entrepreneurship@UBC Accelerator Program, a program for venture creation in UBC that uses the Lean Launch Pad process to quickly discover product-market fit for UBC-linked ventures.

Conclusion

The actions in the *#BCTECH Strategy* support the goals of entrepreneurs, tech companies, and ambitious individuals in British Columbia who want to succeed in the technology sector.

$100 million in venture capital provides the resources companies need to thrive.

Actions in talent will create a pipeline of highly-skilled people prepared and capable of building exceptionally competitive tech companies.

Actions in procurement and facilitating exports, as well as greater collaboration between industry and government, will help industry to sell to markets they have not yet accessed.

We are building on our strengths, fostering the **growth of our vibrant and flourishing technology sector,** and reinforcing its role as a key driver of British Columbia's economy.

These initiatives, combined with the entrepreneurial spirit and business environment that exist in British Columbia, will result in a world-class technology ecosystem, high-paying jobs for driven British Columbians, and prosperity for the province as a whole.

List of **#BCTECH** Strategy Actions

IMPROVE ACCESS TO CAPITAL AND CONTINUE TO SUPPORT OUR COMPETITIVE TAX SYSTEM AND RESEARCH ENVIRONMENT

Investing in a New Venture Capital Fund

- $100 million investment to expand the availability of venture capital in B.C. and address the early stage (A-round) funding gap (though we also recognize the need for access to capital at later stages for continued company growth)

Continue our Competitive Tax Rates and Credits

- Increase the number of B.C. technology companies claiming the Digital Animation or Visual Effects (DAVE) credit or the Interactive Digital Media Tax Credit (IDMTC)
- Continue B.C.'s *Small Business Venture Capital Act* which provides $33 million of tax credits annually

Continue to Build a Strong Research Environment in B.C.

- Genome BC will continue to facilitate turning important insights from genomics into new diagnostic and treatment services
- Attract and keep top research talent in B.C. to generate the development and application of new ideas in areas of key importance to the health system through funding to The Michael Smith Foundation for Health Research (MSFHR)
- Revised the B.C. Knowledge Development Fund criteria to focus on provincial government priorities
- Provide funding to post-secondary institutions to increase commercialization potential

List of **#BCTECH** Strategy Actions

DEEPEN THE B.C. TECHNOLOGY TALENT POOL

Industry-Focused Programs in the Post-Secondary System

- Target funding to programming that supports occupations in demand in the technology sector as part of government's initiative to re-engineer 25% of operating grants to support high-demand occupations
- Align student financial aid funding to expand eligibility for the B.C. Completion Grant for graduates to include students completing programs related to the technology sector
- Continue to promote the use of the B.C. Tech Co-op grants as part of the BCIC Tech Works program
- Recognize the importance of hands-on experience for students – proposals for new technology-related degree programs will need to include co-operative education or work integrated learning components

Timely and Relevant Labour-Market Information

- Provide better information to career educators and their students about a wider range of careers in B.C. tech
- Support the technology sector to customize labour market information, strategies, and tools that address labour market priorities as part of the Labour Market Partnerships Program
- Include an annual provincial 10-year forecast of job openings by occupation, including technology sector occupations, in the B.C. Labour Market Outlook

List of **#BCTECH** Strategy Actions

Applied Learning and Entrepreneur Development

- Support technology sector employers to train/up-skill new and existing employees with supporting funding from the Canada Job Grant
- Build on the first round of coding academies hosted at five public post-secondary institutions
- Build on the Mechatronics Technology Entrepreneurship Incubator at SFU
- Encourage use of the BC Innovator Skills Initiative as part of the BCIC Tech Works program
- Over the course of two years, support Mitacs programs that enable graduate students and postdoctoral fellows to undertake applied research projects relating to their expertise within industry
- Ideas from Campus to Industry program – in partnership with the Okanagan campus of UBC, government has funded industry/post-secondary institutions (PSI) consultations targeted on identifying actions to increase partnerships between industry and PSIs in the Interior

Streamlined In-migration Pathways after B.C. has Maximized our Local Talent

- Help technology companies that need to recruit and access workers from outside Canada through the B.C. Provincial Nominee Program and work with the federal government to improve their permanent immigration pathways
- Work with other provinces and the federal government to improve labour mobility and increase our ability to attract workers to B.C.
- Provide funding for a foreign qualifications recognition project that will help new immigrants fit their skills into alternative, in-demand careers in B.C.'s technology sector
- Promote the federal government's Express Entry program for workers with in-demand technology skills

List of **#BCTECH** Strategy Actions

Dedicated Programs in the K-12 Education System

- Phase in new K-12 curriculum over three years beginning this school year, allowing the opportunity for over 600,000 students across the province to experience new learning standards in mathematics, sciences, and other curricula. These standards develop the foundational knowledge and skills for success in the B.C. technology sector and other technology-enabled sectors
- Once the new curriculum is implemented in 2016/17, every student will have the opportunity to learn coding by the end of Grade 9
- New *Applied Design, Skills, and Technologies* education: an experiential, hands-on learning through design and creation that includes skills and concepts from Information Technology and Technology Education

Grades K-5

- » Students will be given opportunities to develop foundational skills in *Applied Design, Skills, and Technologies* through exploratory and purposeful play
- » As students get older, they will have opportunities to develop foundational skills in activities that have a practical and real-life focus

Grades 6-9

- » Curriculum specific to *Applied Design, Skills, and Technologies* will be developed and available in 2016
- » Students will have opportunities to explore specific areas of *Applied Design, Skills, and Technologies*, including coding

Grades 10-12

- » Students will have the opportunities to specialize in Information Technology, Technology Education or emerging disciplines

- Promote creative thinking as a core competency across the entire curriculum, including technical and business education
- Increase the number of high school students earning elective graduation credit for participating in Work Experience Electives in the technology sector
- Give students increased access to work integrated learning programs in the technology sector enabling them to earn credits toward high school graduation while also earning credits towards a post-secondary certificate or diploma
- Support student opportunities to learn coding in school and outside school through courses and special activities such as the Hour of Code

List of **#BCTECH** Strategy Actions

MAKE IT EASIER TO ACCESS NEW MARKETS

Making it Easier to Sell to Government

- Centralize a procurement program of green technologies to accelerate their adoption by local government and other public sector organizations (for example the LED Street Lights Across BC procurement program)
- Increase the demand for clean tech solutions through the Carbon Neutral Capital Program for ministries, K-12 schools, health authorities, public post-secondary institutions, provincial Crown corporations and agencies
- Continue to streamline procurement processes analogous to the process used to create the short-form request for proposals. A streamlined General Services Agreement is currently being piloted
- Continue to update plain language, online procurement resources for tech companies looking to do business with government, including guidance, videos and templates
- Introduce modern technology and tools to automate and streamline the entire procurement process
- Continue to explore the use of the Open Procurement Hub – a leading edge planning approach allowing us to collaborate with the vendor community in an open/ live moderated forum to answer questions about the contractual needs of government
- Provided an opportunity for B.C. technology companies to participate in face-to-face networking discussions with key government decision makers as part of the B2B meetings at the *#BCTECH Summit* 2016 in order to discuss opportunities for innovation and future partnership. This opportunity signals the initial kick-off for ongoing discussions
- Continue the experiment at *http://bcdevexchange.org* to understand how new approaches to open data, open source code, open Application Program Interfaces (APIs) and open innovation can bring about both new business ideas and streamlined ways for the public sector to buy software innovations
- Establish a working group involving the Ministry of Health, industry and health sector partners to develop policy, strategies and tools that will enable uptake of innovations that improve outcomes, productivity and sustainability of the health-care system

List of #BCTECH Strategy Actions

Making it Easier to Share Ideas

- Start work to identify specific examples of where access to data across and within public sectors can be united in ways to improve public policy and programs, and inform next steps for increasing data available to B.C. companies to boost economic growth
- Okanagan Centre for Innovation – with provincial funding of up to $6 million, it will provide low-cost, flexible space for startups who have graduated from the Accelerate Okanagan Venture Acceleration Program and are still at a venture stage. Construction is underway and is scheduled for completion in early 2017
- BC Agrifood Venture Acceleration Program – technology and agrifood entrepreneurs can now benefit from the program

Making B.C. the Most Connected Province

- Committed to providing high-speed Internet access to 100% of the province by 2021
- Improve the reliability of high-speed Internet access for northern and coastal communities

Facilitating Business Growth through Exports

- Make it easier to find and use services offered by government that equip businesses to expand and sell to new markets
- Improve our competitiveness by developing Sector Investment and Export Plans, one each for life sciences, cleantech, ICT, and digital media
- Realize a 10% increase in the number of tech companies connecting with buyers outside of B.C. by delivering targeted activities in our key markets, including international trade shows, government-led trade missions, and through international marketing
- BritishColumbia.ca – new features on the province's digital hub for promoting B.C.'s sectors, communities and opportunities to the world

Encouraging Commercialization

- Increase adoption of cleantech through government's LNG technology fund, as well as legislation stating that the entire B.C. public sector be carbon neutral by reducing its greenhouse gas emissions to net zero each year

#BCTECH *Sector*

Success Stories:
A Vibrant and Diverse Technology Sector in B.C.

A host of companies have increased the profile of British Columbia as a province from which top-tier technology companies can arise and succeed. BuildDirect, the world's largest online marketplace for home improvement products, Cymax, a company selling furniture and e-commerce retail software, and Vision Critical, a customer intelligence platform that allows big brands to interact with their customers and make good business decisions, are all becoming information and communication sector anchors.

A more established group of technology companies also exists in the province. Global Relay leads information archiving in the financial industry. Sierra Wireless provides machine-to-machine connectivity and cloud services, with the potential of being at the fore of a fully-connected world as the Internet of Things becomes commonplace. MDA provides operational solutions in communications and surveillance and intelligence to commercial and government organizations worldwide.

Companies in British Columbia are developing **ambitious and fascinating** technology.

With its cameras on the International Space Station, Urthecast can stream live-Earth footage to anyone with an Internet connection, for either personal or commercial use. The solution is also used for disaster relief, humanitarian efforts, education, scientific research, and environmental monitoring.

Opportunities to create, adopt, and benefit from technology in British Columbia are increasing, and we intend to enable British Columbians to participate and lead as much as possible by providing fundamental skills and avenues into the sector, while fostering an ecosystem from which future ideas can be realized and a new generation of companies can emerge.

In this era, every company can make use of technology. Technology in data management, for instance, can help make sense of the enormous volumes of data available, coming at a fast rate from a variety of sources, and can drive good business decision making.

More personally for some British Columbians, **technology** in B.C. is having a **positive impact** on lives at school and home.

The following pages illustrate some of the recent developments in technology in British Columbia, and how that technology is intersecting with the lives of British Columbians.

Technology and Education ***in British Columbia***

David Shortreed is a District Vice-Principal who works across 42 K-12 schools in the Greater Victoria School District #61, mentoring and collaborating with educators, parents, and students to discover the best technology tools and to implement them in the best ways. In 2013, Shortreed was recognized by the Victoria Advanced Technology Council with the Education Champion Award for his efforts using technology and innovative learning techniques to guide education in an increasingly tech-enabled classroom.

"I get asked the question a lot," Shortreed says. "'What does 21st Century learning look like? What does a 21st Century classroom look like?' What I'm talking to schools about is our classrooms and our learning are changing."

Education is moving away from fact-searching to inquiry-based learning, in which learners explore questions related to their interests, and are driven and motivated to create meaningful learning experiences for themselves, often employing technology.

"At my core, and what brought me to being in education, is the valuable relationship and connection I build with students, the curiosity, and the sharing of learning. It is through this lens that I then evaluate all new tools, resources, and technology for learning," says Shortreed. "I clearly saw how technology could give students access to resources, experts, community, and answers needed for their own learning. I saw how technology could also help make their own learning more visible through blogging, digital portfolios, and documentation."

One of the opportunities Shortreed sees for technology in the classroom is the personalization of learning. He says, "Instead of everyone having to do the same assignment that is more or less a recipe, it's asking a student what they want to learn about, and then facilitating that desire and also allowing them to share it with people beyond the classroom."

Classrooms in which learners are sharing with others around the world, getting feedback, building community, and showing leadership provide a personal empowerment for students that was not accessible in past decades.

"Our schools are moving away from information hubs and moving toward network hubs, and if we're not providing a network for our learners as they exit our schools, then we're not providing the infrastructure needed for them to be successful," says Shortreed.

Shortreed summarizes his position this way: *"Learning has grown from memorizing answers and information, to asking questions and creating solutions. Technology is the vehicle for this end in mind for me."*

To support this shift in education, the #BCTECH Strategy includes the commitment to providing high-speed Internet access to 100% of the province by 2021, and introduces curricular changes that focus on STEM fundamentals. These changes, along with the Applied Design, Skills, and Technologies program, will impact 600,000 K-12 students over the next 10 years, preparing them to navigate through and capitalize on a world with tech at the fore.

Not limited to the education system, skills development in tech has also been promoted by tech companies, including the multi-national giant Microsoft in Vancouver.

Each year, Microsoft Canada holds YouthSpark Live, a full-day conference for Canadian youth at which they can learn coding skills and explore future career options. Microsoft also holds conferences and support programs that encourage more women to enter tech. DigiGirlz Day is a one-day event, held to provide high school girls with greater insight into careers in technology through interactions with Microsoft employees and managers.

Microsoft Canada Corporate Affairs Director Alexandra Clark said, *"Through programs like YouthSpark, DigiGirlz and Imagine Cup, we help youth envision a future in computer science and introduce them to coding, the building block of technology development. In the process, we want youth to be more than users of technology. We want to empower them to be creators of technology."*

A recent investment in Ladies Learning Code has enabled the organization to extend its Girls Learning Code program, providing free beginner computer programming and technology workshops to girls aged 8-13.

Patient-Centred Care: Technology and Health

New technological capabilities in the province have been facilitating the steady shift toward a patient-centred model of health care, which arranges care as a service built around the individual, who is listened to, respected, and informed.

Health technology enables patient self-management, shared and informed decision-making, enhanced health-care experiences, improved information and understanding, and the advancement of health promotion activities.

An excellent example of health technology that impacts quality of life and hospital productivity is home health monitoring, which allows individuals in urban and non-urban areas alike to receive monitoring and timely treatment without having to leave their homes. For those patients suffering from chronic conditions such as congestive heart failure, chronic obstructive pulmonary disease, diabetes, asthma, or hypertension, home health monitoring eliminates the need for frequent visits to health- care facilities, and significantly increases convenience, comfort, and peace of mind.

Through home health monitoring platforms, patients can learn to effectively manage their health while being remotely monitored by health-care professionals. Each patient is empowered with knowledge and technology, and caregivers can deploy resources and attention effectively and efficiently, overseeing greater numbers of clients. As a patient, you benefit from the feeling of assurance that comes from being constantly in touch with your care providers.

Typically for these programs, patients are referred by health-care professionals, after which a monitoring plan is developed. The plan's execution is monitored and modified as needed by a health-care team. Using instruments such as a weight scale, blood pressure cuff, and pulse oximeter, clients can send their vital signs to a health-care professional from home through a well-designed mobile or PC interface.

Tackling Cancer: Kairos Therapeutics

Kairos Therapeutics is a biopharmaceutical company that was spun out of the Centre for Drug Research and Development (CDRD), an organization which helps develop commercially viable investment opportunities out of life sciences research. Kairos Therapeutics focuses on antibody-drug conjugates (ADC), a rapidly-growing segment of cancer treatment that provides increased benefits to cancer patients.

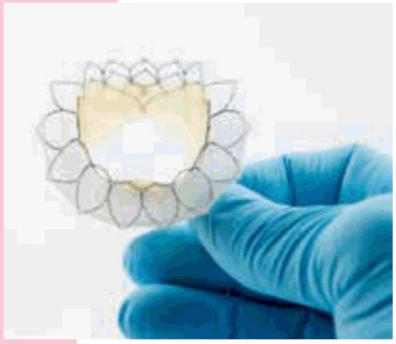
> "The **ADCs target cancer cells** while sparing healthy ones."

ADCs are agents comprised of antibodies that are armed with potent, cell-killing drugs. The ADCs target cancer cells while sparing healthy ones. The antibody part of the agent can be thought of as having a cancer-cell homing capability and the drug as having a lethal payload that is released once the targeted cell has been reached. Kairos Therapeutics has licensed patents that are owned by CDRD, established partnerships with Canadian researchers and private partners, and is developing a number of ADC therapeutics.

"It's an exciting time to be in cancer drug development because of the efficacy that's been observed with ADCs recently. There's a lot of excitement among oncologists and clinicians to develop ADCs," says John Babcook, President and Chief Scientific Officer of Kairos Therapeutics.

In a recent development involving partners including the University of British Columbia and BC Cancer Agency, it was discovered that a mosquito-borne parasite included a protein, called VAR2CSA, that binds with a molecule found in a high number of cancer cell types. The results of tests that include this protein combined with novel toxins have been extremely promising, with positive results across a large number of cancer types. A compound designed for clinical trials in humans is now being prepared.

"We have a very robust platform for personalized cancer treatments. We believe it's a top-tier platform that's competitive globally," Babcook says. "We're trying to get to a place where we can, hopefully, cure patients."



Mending the Heart:
Richmond's Neovasc Addresses Cardiovascular Problems

Neovasc is a B.C. company working on technology to increase patient care and enhance quality of life. The company, located in Richmond, creates and markets products that address cardiovascular problems.

One of these problems is mitral regurgitation. The mitral valve, situated between the left chambers in the heart, ensures that blood in the heart flows in the correct direction, from the left atrium to the left ventricle. When this valve fails, mitral regurgitation can occur where blood flows the wrong way, back into the left atrium, and into the lungs.

This common valve problem can cause shortness of breath, fatigue, irregular heartbeats, and, in extreme cases, death. Unfortunately, current surgical treatments for the ailment are only suitable for a fraction of the patients suffering from its effects.

Neovasc's product, Tiara, is a novel device designed to treat mitral regurgitation and its numerous accompanying challenges. The device, which is currently in early feasibility testing stages, goes into the heart and replaces the valve without having any negative effects on the surrounding tissue.

"What we are looking to do is to provide a new treatment therapy for patients who are suffering from mitral regurgitation, and who don't currently have a treatment option," says Neovasc's CFO Christopher Clark.

Neovasc also produces the Reducer, which is a treatment for another ailment that impacts millions across the world: refractory angina. Refractory angina can be debilitating, the result of inadequate blood flow to the heart muscle. The severe pain

"Neovasc is a B.C. company working on technology to **increase patient care** and enhance **quality of life**."

patients experience can be difficult to relieve. Without many options for remedy, quality of life for patients with refractory angina is severely impacted.

The Reducer technology, which is currently available in the E.U., involves a procedure akin to the implantation of a coronary stent.

"We've always tried to put the patient first in everything that we do. We've identified the needs that were unmet, and we're trying to solve them with innovative products," says Clark.

"If patients have successful treatment, they typically can resume a more normal life, and generally have a better quality of life."

Improving Quality of Life: ***CanAssist***

Housed in the University of Victoria, CanAssist is helping to improve the quality of life and independence of individuals with disabilities. In partnership with academic and disability communities, the organization works to expand inclusiveness in society through the creation of technology, programs, and services that increase the ability of those with disabilities to engage and contribute.

Individuals, families, and communities have been touched by this work. CanAssist has provided customized technology and software that cuts across demographics and locations. Infants, children, adults, and seniors have all been impacted by their technology and design, and they have extended this impact beyond British Columbia, as people from New Zealand, China, Scotland, and Kenya have experienced CanAssist's life-changing customized technology solutions.

One such client is Gordon. For Gordon, a spinal cord injury meant a tremendous curtailment of independence in performing day-to-day tasks. As an individual who loves reading and computers, not being able to turn pages or easily operate a computer created tremendous frustration.

CanAssist delivered technology-enabled solutions that improved Gordon's quality of life. Through an iPad, customized mount, and mouth stick, he has greater ability to use the computer. Through a customized zero gravity arm support which will keep his arm supported in a neutral state, he will again be able to independently feed himself.

"**CanAssist** has provided **customized technology** and software that cuts across demographics and locations."

The Health Technology Cluster: ***Innovation Boulevard***

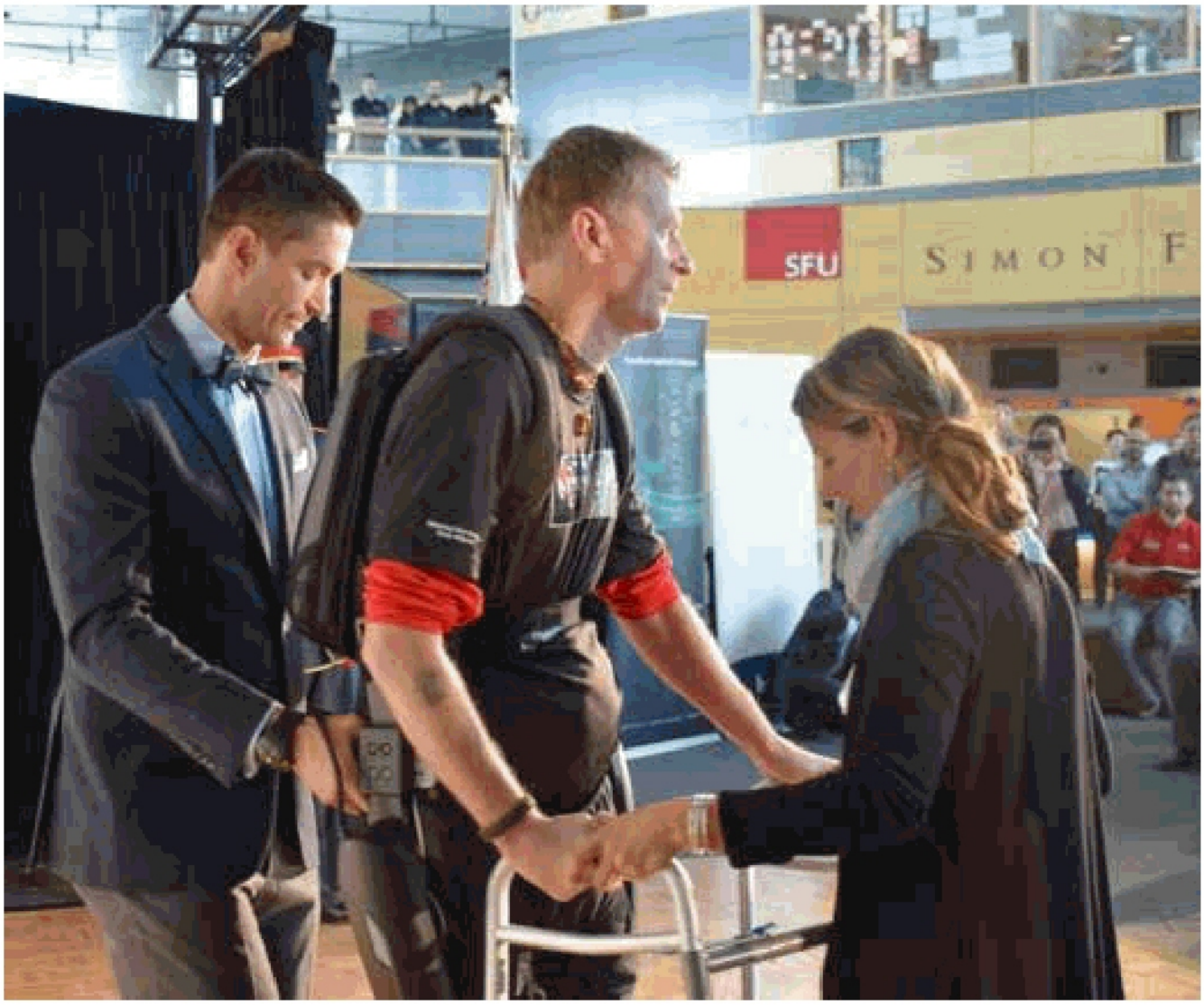
In 2006, while Captain Trevor Greene was in Afghanistan serving with the Canadian military, he sustained a severe brain injury in an axe attack. The attack nearly killed him, and the resulting damage made the likelihood of walking again next to zero.

This past September, though, at the Surrey campus of Simon Fraser University, Greene publicly took steps with the aid of a customized mechanical exoskeleton, the result of a several years-long collaborative project named Iron Soldier, led by neuroscientist, SFU professor, and Surrey Innovation Boulevard Co-Chair Dr. Ryan D'Arcy, and supported by a number of medical and engineering professionals from the region and around the world. The public steps Greene took marked the opening of a new avenue in brain rehabilitation and technology.

The name of the location where the work, improvement, and breakthrough took place could not be more fitting: Innovation Boulevard.

Encompassing one square mile in Surrey's city center, the Innovation Boulevard is a medical sciences and technology cluster comprised of companies, health research institutions, health professionals, and universities focusing and collaborating on development in three main areas: medical technologies, independent health technologies, and digital health technologies.

"In terms of the expectations," says D'Arcy, "that's always been really clear and always will be: That's to continue to use tech innovations and the power of our cluster to make an impact on the individuals right in front of us and their healthcare."



The Innovation Boulevard, founded in 2012 by the City of Surrey, Simon Fraser University, and the Fraser Health Surrey Memorial Hospital, is an excellent demonstration of the ongoing integration of technology in a sector that is touching and improving individual lives on a daily basis.

"The hopes are that Innovation Boulevard continues to demonstrate for British Columbia the huge potential when we work together in partnership and focus our energies on a global race," says Dr. D'Arcy.

The vision for this health technology cluster is to improve health outcomes, implement intelligent solutions for the health-care system, attract talented clinicians and researchers, and grow companies in the health-care technology sector to better serve the residents of B.C.

"**STEMCELL Technologies** employs over **800** professionals, around **650** of whom are in British Columbia..."

On the Front Line of Biotech: ***STEMCELL Technologies***

STEMCELL Technologies, the envy of entrepreneurs across Canada, produces standardized, high-quality cell culture media for growing stem cells, selling to academic researchers and pharmaceutical companies across the world.

Stem cells are the "mother cells" of the body, having the ability to transform into other types of tissue. This has enormous implications for patient treatment across a large number of diseases and medical conditions, including leukemia, Alzheimer's disease, heart disease, and diabetes. The media that STEMCELL produces is optimized for the growth of stem cells.

Stem cell research has become common. Previously, research was done with embryonic stem cells. That's rarely the case these days. Now, researchers can make stem cells from almost any cell in the body by manipulating its gene expression to have the traits of a stem cell. These are called induced pluripotent stem cells. Researchers need a medium with particular nutrients in which to grow these cells.

STEMCELL Technologies produces these tissue culture media along with cell isolation products, giving researchers the tools needed for study.

"We provide the picks and shovels for the stem cell gold rush," says President and CEO Dr. Allen Eaves.

The company was spun out of the Terry Fox Laboratory at the BC Cancer Agency in 1993 by Eaves, who was a Director at the unit and a research scientist working on bone marrow transplants. Since its inception, STEMCELL has earned over $550 million in revenue including approximately $100 million earned last year, the vast majority from export markets.

STEMCELL Technologies employs over 800 professionals, around 650 of whom are in British Columbia. Of these, Eaves estimates approximately 100 are PhDs, and around another 100 have a Master of Sciences.

The company has been a destination for the province's bright science students. "We have a wonderful education system, turning out all sorts of PhDs and post-docs," Eaves says.

"These are people that love science, are motivated to do science, and are trained to do excellent science."

The growth of the company has been staggering, and over the next ten years, Eaves anticipates continued growth necessitating the hiring of around 2,000 more people.

"We need to have the companies in Canada to be the receptor for these smart young students," Eaves says. "And I want STEMCELL to be one of those."

STEMCELL is also an excellent example of a technology company at which professional women thrive, with over half the employees being women and a leadership team of ten composed evenly of men and women.

Joan Sheehan, Vice President of Sales at STEMCELL, joined the company in its first year. Sheehan says, "Our only criteria for hiring is merit. We operate in a highly competitive global market, and we need to hire only the very best people."

Capitalizing on our Cleantech Expertise: ***Evok Innovations and Foresight***

In B.C.'s cleantech sector, approximately 200 firms employ over 6,000 people, and generate revenue on the order of $1.7 billion.[31]

Developments in cleantech in British Columbia include the establishment of the unique cleantech accelerator, Foresight, and the oil and gas cleantech fund and accelerator, Evok Innovations, both of which have the aim of coalescing B.C.'s technical and business capabilities to create companies that profitably develop cleantech solutions that reduce the environmental footprint and costs of key industries, and makes the world a better, cleaner place.

3 KPMG LLP, British Columbia Technology Report Card, (2014), Edition, 2014, pg. 9

FORESIGHT CLEANTECH ACCELERATOR CENTRE

While often associated with alternate forms of energy, cleantech encompasses a number of applications that span across many sectors, yielding benefits from increased energy efficiency to improved use of waste materials.

Foresight was established in 2013 and joined the BC Innovation Council's BC Acceleration Network. In its Venture Acceleration Program, multiple executives-in-residence, and a network of cleantech business mentors focus on helping companies perform customer discovery and business model development around a strong value proposition, without which a company's technology is unlikely to succeed in the marketplace.

To get companies to commercialization, Foresight has a program with the Business Development Bank of Canada that provides $250,000 in financing to promising early stage companies provided it is matched by at least the same in private investment.

One of the accelerator's companies, Dark Vision, with its downhole imaging technology, has received this investment to take its projects to market.

"Foresight has a program with the Business Development Bank of Canada that provides **$250,000 in financing** to promising early stage companies..."

EVOK INNOVATIONS CLEANTECH ACCELERATOR

Given the massive amount of oil, gas, and technical expertise that exist in British Columbia and Alberta, there is a great opportunity to create partnerships between the two provinces and combine capabilities to enhance the industry and create profitable businesses.

Cleantech innovations that address environmental challenges and reduce costs in the oil and gas value chain have tremendous potential.

To help realize this potential, Evok Innovations, a non-profit Vancouver-based $100-million cleantech oil and gas fund and accelerator, has been created. The leadership team and advisory group includes some of the largest and most renowned organizations in B.C.'s cleantech industry. Through Evok Innovations, there is an opportunity to build companies and a greater economic and environmental partnership between British Columbia and Alberta.

Evok Innovations will finance and accelerate solutions in the industry by focusing on early stage, innovative companies that address carbon, environment, and cost-competitiveness challenges. The fund supports innovation such as greenhouse gas reduction and recovery, water treatment, and new clean energy products.

The accelerator also represents a partnership among leading Western Canadian oil and gas companies and the B.C. Cleantech CEO Alliance, and strives to leverage the oil and gas resources and B.C.'s technology expertise to advance innovation and adoption that progresses the industry, the economy, and the environment, attracting the brightest innovators to focus on Western Canada's oil and gas challenges while creating new cleantech companies and long term technology jobs.

In addition to being a source of funding, Evok Innovations' accelerator provides a global network of mentors, venture capital sources, and direct access to a customer base in Canada's oil and gas sector. Solutions created here can be exported to solve similar problems throughout the world.

By applying Evok Innovations-funded cleantech solutions to current problems in the oil and gas industry, British Columbia can bolster its place as a world-class hub for clean technology innovation, and Alberta has the opportunity to build its oil and gas sector's competitiveness.

"The **University of British Columbia**, in collaboration with **Boeing**, sustainable jet fuel market leader **SkyNRG**, and other aviation stakeholders will be **at the leading edge of clean energy technology**..."

Biomass to Jet Fuel:
UBC and the Aviation Sector Tackle Climate Change

UBC, Boeing, and other aviation stakeholders have partnered to create technology to reduce climate change.

In spite of technical, operational, and engineering improvements in aviation, carbon dioxide emissions from the use of conventional fuels is likely to increase going forward due to ongoing growth in air traffic.

The University of British Columbia, in collaboration with Boeing, sustainable jet fuel market leader SkyNRG, and other aviation stakeholders will be at the leading edge of clean energy technology, studying whether cleaner aviation fuel can be created using a material that is abundant in the province and the country: forestry waste.

The partnership arose after a 2015 study by UBC, sponsored by Boeing, determined that 10% of the province's annual aviation fuel needs could be met by biofuels created from waste, such as leftover branches and sawdust.

"The most promising approach for long term emission reductions is through the introduction of renewable aviation fuel (biojet) derived from sustainably sourced biomass," says Susan van Dyk, Project Manager for the Integrated Biological Biorefinery Task Force with the UBC Forest Products Biotechnology/ Bioenergy Group.

Studies have shown that using this type of biofuel can reduce lifecycle carbon dioxide emissions by 50 to 80% when compared to fuel used today.

UBC was a natural choice for a partner in the project. "We decided to work with UBC because they have world-leading expertise in the area of forest-based biofuel and bio-product research. They are also a powerful convener in the province, having a position of respect with a strong network of industry and government stakeholders," says Michael Lakeman, Regional Director of Biofuel Strategy at Boeing Commercial Airplanes.

The project aims to make a positive impact beyond the aviation industry.

"The vision is that regionally appropriate, sustainable biofuel supply chains are developed to provide fuel for airlines wherever they operate," says Lakeman. "In doing so, benefits flow not only to aviation, but also to other significant sectors of the economy that will experience growth from this new industry, such as the forestry sector in Western Canada. Many of the solutions being pursued also provide other environmental or social benefits, such as reduced local air pollution, enhanced water or soil quality, rural economic development and employment opportunities."

Enhanced Food Production: ***Ecoation Innovative Solutions Inc.***

B.C. companies' innovations in food production are also being exported throughout the world.

Ecoations, located in North Vancouver, has developed Crop Sense, a technology that detects minute pest and disease problems early on, enabling growers to address infestation concerns quickly and proactively. The technology is so precise that after thirty seconds of plant signal measurement, it indicates which specific plants have pest problems, how many insects comprise the infestation, their locations, and the duration of time they have been feeding on the plant.

The company has received orders from early adopter customers who want to deploy Crop Sense inside their greenhouses.

Apart from business improvements derived from the technology, Crop Sense is helping to reduce pesticide applications involved in the food that goes on a family's table.

The technology developed in the province will have benefits elsewhere in the world. The Bill & Melinda Gates Foundation has provided funds to support a team of international experts, which Ecoation has joined, to create pest management tools for cowpea farmers in West Africa.

"The **technology** developed in the province will have **benefits** elsewhere in the world."

Women in Tech:
RevenueWire's CEO and Executive of the Year

Bobbi Leach, CEO of RevenueWire, has just had a banner year having been named 2015 Executive of the Year by the Victoria Advanced Technology Council and awarded the Stevie Award for Female Executive of the Year in Canada.

RevenueWire, headquartered in Victoria, securely processes online payments for companies in over 120 countries that sell digital products. Combined with performance marketing services, RevenueWire also helps digital companies acquire new customers and optimize their revenue.

Over the past five years, RevenueWire has experienced enormous growth, a result Leach credits primarily to the company's passionate team and its ability to build technology and end-to-end services that address their clients' evolving needs.

For women aspiring to have a career in tech, specifically as a founder or executive, Leach makes an exceptional role model.

In the six years Leach has been CEO, revenue at the company has grown nearly 400%, and the number employed has increased more than five-fold.

The key determinant to a successful career in tech, according to Leach, is curiosity and the willingness to pursue it.

"The most important characteristic to a successful career in tech is your natural curiosity. Technology and markets are constantly changing, so you need to embrace the reality of continuous learning and adapting in order to survive and prosper," says Leach.

People entering the tech sector should focus on having strong vision and being able to identify a real market opportunity.

"Whether it's a career in tech or starting your own tech company, **you need to be passionate about what you're pursuing,"** says Leach. **"**There are going to be challenges and setbacks, so you need to believe in your vision and your abilities in order to persevere."

Empowering Better Decisions: ***Burnaby's Copperleaf***

The team at Copperleaf understands its work as "building a better world, one decision at a time".

Located in Burnaby, Copperleaf is a company that provides a decision analytics software solution to organizations that manage infrastructure, empowering those organizations to manage risk and improve performance through optimal decision making about the timing and domains in which to invest.

Copperleaf works to ensure effective capital planning across asset-heavy industries that include electrical power generation, transmission and distribution, and gas and water utilities.

In the case of electricity providers for instance, Copperleaf helps companies make investment decisions that will improve the reliability and safety of the grid in a cost effective way. For water utilities, Copperleaf enables them to decide how to invest in their infrastructure to deliver drinking water safely, reliably, and economically.

Copperleaf is headed by CEO Judi Hess, who has a long career in technology leadership. Hess provides words of encouragement for women who have their eyes on a career in tech.

"It's important to be tenacious and to be a risk taker - jumping on opportunities when they present themselves," says Hess. "You should be comfortable, even if you are the only woman in the room, and if we keep doing that more women will follow. And very importantly, as a woman, you need to continually promote women in tech and women in leadership positions, so we have more role models to provide diversity and, with it, strength."

She continues, *"I think having an education in a STEM field is the basis, and from there, it's the ability to continually learn, because in tech the rate of change is very fast.* As they say 'things are moving faster today than ever before, but it's the slowest they will ever be!' So adaptability is key. If you like a challenge, if you like to create things, and if you like to work in a team then tech is for you."

Hess also describes the benefits of building a tech company in B.C:

"B.C. is a great location for high tech. The tax structure *(e.g. SRED program, low corporate taxes)* benefits high tech companies doing research and development in B.C. and doing business here. There is a great talent pool and metro Vancouver is one of the most livable cities in the world with oceans and mountains and a reasonable climate all rolled into one to attract and retain the best talent."

Bringing E-Voting to First Nations Communities: ***OneFeather***

"If it's your turn to speak, you hold the feather, or alternatively, a talking stick," says Lawrence Lewis, referencing the traditional tool used when council meets among some First Nations communities.

"[The name] OneFeather represents that this is a communication tool to make a cultural and social connection,"says Lewis.

Victoria-based OneFeather provides First Nations communities with a modern, mobile, permission-based communication platform that increases the opportunity for engagement through messaging among private online groups.

Through the app, all stakeholders in a First Nations community can speak and be heard on important topics.

"This is about engagement and dialogue. It's not about a one-way flow of information," Lewis says.

He also says the question for these communities is, *"How are you going to use modern technology to engage with your members in a way they want to be engaged?"*

After developing the communications app, Lewis realized that OneFeather would make a suitable platform for electronic voting. OneFeather worked with the government and several Nations to develop a platform, an intuitive user experience, a simple verification process, and the security and secrecy requirements necessary to ensure the integrity of a vote.

After members download the app, they receive a push notification when there is a referendum or election, and through the messaging feature, they can talk to electoral officers in real time.

Through the feature, it takes less than two minutes to go from opening the app to full verification and vote. As a result, OneFeather has been used in several referendums.

Lewis states that in the recent Malahat First Nation Land Code referendum, over 75% of the votes cast were done electronically through OneFeather, primarily from smartphones. The referendum also saw a significant increase in voter participation.

"Engagement goes up as convenience goes up," Lewis says. Complementing polling stations and mail-in ballots, the e-voting platform is one more item in the toolkit to increase turnout.

The long term goal for OneFeather is to eventually become the mobile-based solution for municipal, provincial, and federal elections.

"As an **Aboriginal** company, our **focus** right now is on **First Nations** communities, but we're always **planning** and **building** and **networking** to get to the next level," says Lewis.

Photo courtesy of: Cloudhead Games

Tech Companies *are Everywhere*

The opportunity to develop a technology solution and bring it to market is not only available to those living in major cities. Companies are serving customers from locations throughout the province.

HY-TECH DRILLING

In 1991, Hy-Tech Drilling Ltd. was founded in Smithers. Today the company has revenues in the tens of millions.

The company produces unique value on both the hardware and software sides of the drilling business. Their proprietary technology, the TECH 5000 drill, is used in mining operations in Canada and Western Europe, along with FieldView™, a software product that tracks metres drilled along with the cost per metre, refining the business of mining.

CLOUDHEAD GAMES

Since late 2012, the team at Cloudhead Games have been working as pioneers in virtual reality from Coombs. In 2013, they validated the idea for the immersive, exclusively virtual reality game, *The Gallery: Six Elements*, with a Kickstarter campaign.

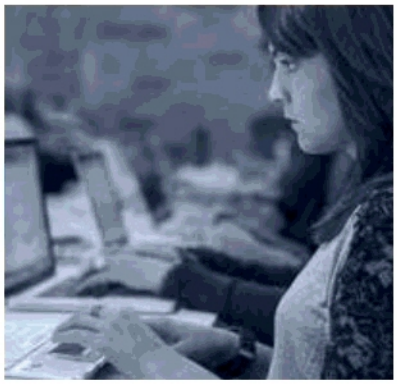
The team intends to build on its early validation to remain one of the premiere virtual reality studios in existence, operating across all virtual reality platforms, including Oculus VR and Samsung Gear.

From outside a major urban area, this company in British Columbia is redefining the audio, locomotion, and player experience in gaming, moving the industry forward.

Conclusion

The tech sector in B.C. is vibrant, diverse, and open to all British Columbians, delivering opportunities for participation, benefit, and profit in personal or professional spheres. The *#BCTECH Strategy* aims to augment this vibrancy with improved infrastructure, procurement programs, education, and capital, so that as technology becomes increasingly prominent in our economy, British Columbians are in the best position to capitalize and benefit.

"The tech sector in B.C. is **vibrant, diverse**, and open to all British Columbians."



Notes

CANADA STARTS HERE

BC JOBS PLAN

BRITISH COLUMBIA

The #BCTECH Strategy 2016

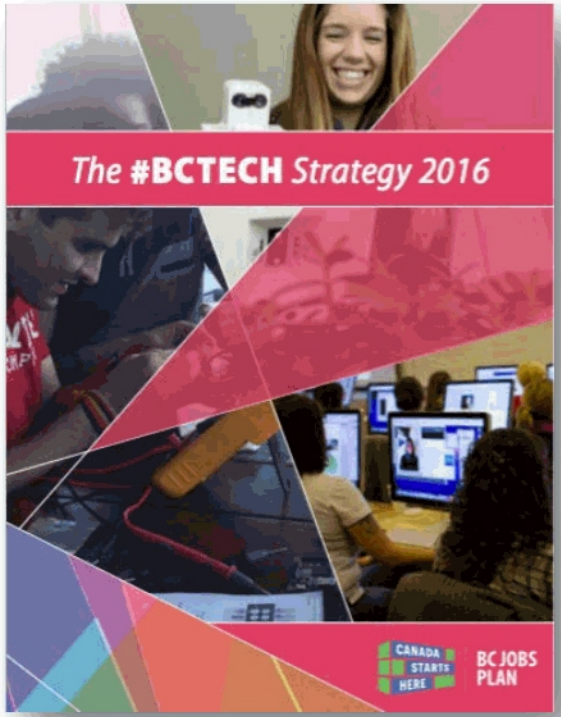
CANADA STARTS HERE

BC JOBS PLAN

BRITISH COLUMBIA

#BCTECH Strategy

- The **#BCTECH** Strategy is part of the BC Jobs Plan
- The **#BCTECH** Strategy is a government-wide strategy to expand job growth in BC's technology sector
- Announcement on December 8th delivered two messages:
  - There's a three-part strategy
  - Explained the VC fund component
- Will explain the rest in early 2016



CANADA STARTS HERE | BC JOBS PLAN

#BCTECH Strategy

3 Pillars

Capital

Improve access to capital and continue supporting our competitive tax system and research environment

Talent

Deepen the BC technology talent pool—BC tech companies need to have access to the best people

Markets

Make it easier to access new markets including selling to government and accessing international markets

Capital

Investing in a New Venture Capital Fund	• $100 million investment to expand the availability of venture capital in B.C. and address the early stage (A-round) funding gap
Continue our Competitive Tax Rates and Credits	• Increase the number of B.C. technology companies claiming digital media tax credits • Continue B.C.'s Small Business Venture Capital Act which provides $33M of tax credits annually
Continue to Build a Strong Research Environment in B.C.	• Attract and keep top research talent in B.C. in areas of key importance to the health system • Revised the B.C. Knowledge Development Fund criteria to focus on provincial government priorities • Provide funding to post-secondary institutions to increase commercialization potential

Talent

Industry-Focused Programs in the Post-Secondary System	• Target funding to programming that supports occupations in demand (re-engineer 25% of operating grants to support high-demand occupations) • Align student financial aid funding to expand eligibility for the B.C. Completion Grant • Continue to promote the use of the B.C. Tech Co-op grants as part of the BCIC Tech Works program • New technology-related degree programs to include co-operative education or integrated work learning
Timely and Relevant Labour-Market Information	• Provide better information to career educators and their students about a wider range of careers in B.C. Tech • Customize labour market information, strategies and tools that address labour market priorities (Sector Labour Market Partnerships Program) • The B.C. Labour Market Outlook will include a 10-year forecast of job openings by occupation of technology sector occupations

Talent

Applied Learning and Entrepreneur Development

- Support technology sector employers to train/up-skill new and existing employees with supporting funding from the Canada Job Grant
- Build on the first round of Coding Academies
- Build on the Mechatronics Technology Entrepreneurship Incubator at SFU
- Encourage use of the BC Innovator Skills Initiative as part of the BCIC Tech Works program
- Support Mitacs programs that enable graduate students and postdoctoral fellows to undertake applied research projects relating to their expertise within industry
- In partnership with the Okanagan campus of UBC, government funded consultations targeted on identifying actions to increase partnerships between industry and PSIs in the Interior
- Enhance the B.C. Innovation Council Venture Acceleration Program

Talent

Streamlined In-migration Pathways after B.C. has Maximized our Local Talent	• Improve labour mobility and increase our ability to attract workers to B.C. • Increase use of the B.C. Provincial Nominee Program and work with the federal government to improve their permanent immigration pathways • Provide funding for a foreign qualifications recognition project • Promote the federal government's Express Entry program
Dedicated Programs in K-12 Education System	• Phase in new K-12 curriculum for over 600,000 students to experience new learning standards in mathematics, sciences, and other curricula. • New Applied Design, Skills, and Technologies education • Promote creative thinking as a core competency across the entire curriculum, including technical and business education • Increase the number of high school students participating in Work Experience Electives • Give students increased access to work integrated leaning programs Support student opportunities to learn coding in school and outside school through courses and special activities such as the Hour of Code

Markets

Making it Easier to Sell to Government

- Centralize a procurement program of green technologies
- Increase the demand for clean tech solutions for K-12 schools, health authorities, and public post-secondary institutions
- A streamlined General Services Agreement is currently being piloted
- Introduce modern technology and tools to automate and streamline the entire procurement process
- Continue to explore the use of the Open Procurement Hub
- Start B2B meetings at the #BCTECH Summit on January 18th & 19th in order to discuss opportunities for innovation and future partnership.
- Continue bcdevexchange.org for new approaches to open data, open source code, open Application Program Interfaces (APIs) and for the public sector to buy software innovations
- Establish a working group involving the Ministry of Health, industry and health sector partners to develop policy, strategies and tools that will enable uptake of innovations within the health care system

Markets

Making it Easier to Share Ideas	• Identify opportunities to improve data available to B.C. companies • Okanagan Centre for Innovation, $6 million investment opens in 2017 • BC Agrifood Venture Acceleration Program
Making B.C. the Most Connected Province	• Committed to providing high-speed Internet access to 100% of the province by 2021 • Improve the reliability of high-speed Internet access for northern and coastal communities
Facilitating Business Growth through Exports	• Sector Investment and Export Plans, one each for life sciences, cleantech, ICT, and digital media • Realize a 10% increase in the number of tech companies connecting with buyers outside of B.C. through international trade shows, government-led trade missions, and through international marketing • BritishColumbia.ca – new features on the province's digital hub for promoting B.C.'s sectors, communities and opportunities

The #BCTECH Strategy 2016

CANADA STARTS HERE

BC JOBS PLAN

BRITISH COLUMBIA

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MINISTRY OF EDUCATION
BRIEFING NOTE

DATE:
CLIFF:

PREPARED FOR: Dave Byng, Deputy Minister, for **Decision** at the request of the **Learning Division** for a **BC Youth Coding Event** and **Hour of Code** letter of endorsement to superintendents.

SUBJECT: BC Youth Coding Event – Request for Endorsement Letter

BACKGROUND:
The BC Youth Coding Event is a mass youth coding event hosted in celebration of the global computer science and digital literacy awareness campaign called the "Hour of Code". During Computer Science Week from December 7 to 13, four major cities in BC (Victoria, Vancouver, Kelowna and Prince George) will host an event where up to 100 kids from age 8 to 18 per community will get together for half a day to learn how to code for *free.* The initiative is supported by the Ministry of Education, the BC Teachers' Federation's CUEBC (Computer Using Educators of BC) and host partners in each region.

DISCUSSION:
The BC Youth Coding Event is a Technology Industry initiative undertaken in partnership with numerous stakeholders, including the Ministry of Education.
The objectives of the BC Youth Coding Event are to:

- Provide youth in BC with exposure to coding education for free
- Raise the awareness of the value of coding and computer science to the general public
- Inspire youth, particularly girls, to consider a career in technology in order to promote gender equality in computer science
- Engage in a dialogue with the key stakeholders who are part of a student's upbringing and education, on the importance of digital literacy

Participating Cities, Hosts and Event Dates

- December 5 - Vancouver, hosted by Lighthouse Labs
- December 12 - Prince George, hosted by Innovation Central Society
- December 12 - Victoria, hosted by Metalab
- January 2016 - Kelowna, hosted by UBC Okanagan

What will happen during the events?
The events will be half day affairs with up to 100 students and 20 or more industry developers as mentors. A lead instructor will provide a short lesson about coding. The students will then break off to work on a hands-on project with curriculum donated by Learning Partner, Lighthouse Labs. Mentors will be available to help students with their project and engage in conversations about careers in technology. Within a couple of hours, students will go home with a project that they can show to their parents and teachers.

In addition to the special **BC Youth Coding Event** in four BC cities, all districts in the province can participate in the general **Hour of Code** celebration. Last year, 114 BC schools participated.
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RECOMMENDATIONS:

- s.13

Attachment(s)
Draft letter of endorsement

Contact Information		**Agree / Disagree:**
Department Name Department Phone # Department File	**ADM initial**	**Dave Byng** **Deputy Minister**
		Date signed:

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MINISTRY OF EDUCATION
DECISION NOTE

DATE:
CLIFF:

PREPARED FOR: Deputy Minister Education, for **Decision** at the request of Learning Division

SUBJECT: Options for Mandatory Coding

BACKGROUND:
As part of the BC Technology Strategy announced by Premier Christy Clark on January 18th, 2016, the new Applied Design, Skills and Technologies (ADST) curriculum for K-9 will give BC students an opportunity to learn computational thinking skills and experience coding by grade 9. Government's goal is that students will graduate with the skills they need for a modern economy, including coding. During the announcement, the Premier signaled a desire for coding to become mandatory.

Coding in ADST (Applied Design, Skills, and Technologies):
The proposed ADST curriculum is designed as modules. Schools choose the modules they want to offer. Modules include: Computational Thinking, Computers and Communication Devices, Digital Literacy, Drafting, Entrepreneurship and Marketing, Food Studies, Media Arts, Metalwork, Power Technology, Robotics, Textiles, and Woodwork.

Coding appears in the Computational Thinking Section of ADST. The development of Computational Thinking skills can begin in the Primary years, but Computational Thinking is not mentioned in the ADST draft curriculum competencies until grade 6, when students may be introduced to algorithms, binary numbers and programming languages.

Current Coding Activities:
s.13

4. Resource creation for teachers.
5. Coding camp pilots occurred in Victoria, Vancouver, Prince George, and Kelowna in December 2015 and January 2016.

DISCUSSION:
The Learning Division proposes a 3-year implementation plan leading to mandatory coding. The plan includes new curriculum, teacher training, and resources for Grades 6-9.

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OPTIONS:

Option 1: s.13

Pro:
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Con:
s.13

Option 2: s.13

Pro:
s.13

Con:
s.13

RECOMMENDATION:
s.13

MINISTRY OF EDUCATION
BRIEFING NOTE

DATE:
CLIFF:

PREPARED FOR: Dave Byng, Deputy Minister, for **Decision** at the request of the **Learning Division** for **coding implementation**.

SUBJECT: Coding Investment

BACKGROUND: As part of the BC Technology Strategy coding has been identified as a key component to support students to prepare for the jobs of tomorrow.

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DECISION:
Option 1 - Approve implementation plan outlined above
Option 2 – Do not approve the implementation plan outlined above

RECOMMENDATION:
Option 1

Contact Information Department Name Department Phone # Department File		**Approved**
	ADM initial	**Dave Byng** **Deputy Minister**
		Date signed:

MINISTRY OF EDUCATION
BRIEFING NOTE

CODING IMPLEMENTATION PLAN

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CURRENT ACTIVITIES:

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4. Resource creation for teachers
5. Coding camps pilot – Victoria, Vancouver, Prince George, Kelowna

MINISTRY OF EDUCATION
BRIEFING NOTE

DATE:
CLIFF:

PREPARED FOR: Dave Byng, Deputy Minister, for **Decision** at the request of the **Learning Division** for **coding implementation**.

SUBJECT: Coding Investment

BACKGROUND: As part of the BC Technology Strategy coding has been identified as a key component to support students to prepare for the jobs of tomorrow.

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DECISION:
Option 1 - Approve implementation plan outlined above
Option 2 – Do not approve the implementation plan outlined above

RECOMMENDATION:
Option 1

Contact Information Department Name Department Phone # Department File		**Approved**
	ADM initial	**Dave Byng** **Deputy Minister**
		Date signed:

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Dear CS Educator,

Your work is changing the face of education. Your tireless efforts have helped raise the awareness of the importance of CS education and you've been part of the movement that's introduced *100 million students worldwide* to their first Hour of Code.

The Hour of Code 2015 is coming!
We hope we can count on you to help this movement reach 100,000 Hour of Code events during Computer Science Education Week, December 7-13. This year, in addition to exciting new tutorials, Hour of Code is also offering a set of teacher-guided, one-hour lesson plans for experienced CS educators like you to share with colleagues.

Register your ENTIRE school
Please, work with your principal to introduce your entire school to computer science. This is a great tool to recruit more diverse students to your classes and get more support for CS at your school.

We've included a brochure to share with a teacher new to the Hour of Code, and posters and stickers to build excitement.

Gifts for EVERY educator!

- Every educator who registers for the Hour of Code will receive a gift.
- Sign up to hear about more prizes coming soon!

As you know, one hour can be enough to inspire more learning. Let's empower *every* student to pursue bright futures with technology and give *every* student access to the foundations of computer science.

Sign up at [illegible].

Mike Silverton
President, CUEBC

Hadi Partovi
Founder, Hour of Code

Tech Strategy – EDUC Summary

Current Initiatives

Hands-on Training

- Dual credit

s.12,s.13

Work Experience

Program Standards

- Digital Literacy Standards
- Curriculum Development:
  - Applied Skills ★
  - Careers ★
  - Science ★
  - Mathematics ★

Broadband

- Next Generation Network ★

Career Awareness Resources

- Career Zones:
  - Existing: Mining, Energy, and ICT
  - Future: 3 new, including Life Sciences ★

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Education Context

- In Education, this activity area is frequently referred to as STEM (science, technology, engineering, and mathematics)
- Talent development for the sector begins with K12 curriculum standards, awareness opportunities, and hands-on activities
- Many Blueprint commitments also support the Technology and Innovation strategy

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★ = potential announceable within 12 months

Transfer #: _____

Ministry of Education

GOVERNMENT TRANSFER REQUEST

MINISTRY TRANSFER IDENTIFICATION					
GOVERNMENT TRANSFER NAME:	s.13				
START DATE:	s.13	END DATE:	s.13	TOTAL AMOUNT:	s.13
DIVISION:	**Learning Division**	BRANCH:	**Graduation Skills and Distance Learning**		
MINISTRY CONTACT NAME:	**Tim Winkelmans**	PHONE #:	**250 217-6643**		

BACKGROUND / DETAILS	
PURPOSE / NATURE OF GOVERNMENT TRANSFER:	**This funding is to support school districts and independent schools to implement new computer learning coding standards in the BC curriculum.**
LINK TO THE SERVICE PLAN:	**Service Plan commits the Ministry to support #BCTECH strategy priorities, which commits the K12 system to ensuring that every student has the opportunity to learn coding by the time they leave Grade 9. The High Standards Goal (Objective 3.1) includes developing digitla literacy skills.**
MINISTRY'S ROLE:	s.13
EXPECTED ACTIONS AND OUTPUTS:	
WHAT ARE THE EXPECTED OUTCOMES?	
HOW WILL THE MINISTRY HOLD THE RECIPIENT ACCOUNTABLE FOR RESULTS? • PERFORMANCE TARGETS • REPORTS	

TRANSFER TYPE

☒ GRANT – DISCRETION OF GOVERNMENT WITH STIPULATIONS.

☐ ENTITLEMENT – RECIPIENT MEETS ELIGIBILITY CRITERIA. PRESCRIBED BY LEGISLATION.

☐ SHARED COST ARRANGEMENT – CONTRACTUAL AGREEMENTS WITH STIPULATIONS.

FINANCIAL INFORMATION

ACCOUNT CODING:	CLIENT	RESPONSIBILITY	SERVICE LINE	STOB	PROJECT

BUDGET BREAKDOWN:		
	$	FY16
	$	FY
	$	FY

AUTHORIZATION

☐ LEGISLATION (NAME):

☐ REGULATION (NAME):

☒	DISCRETIONARY:
☐	OTHER (SPECIFY):

Transfer #: _____

RECIPIENT IDENTIFICATION

LEGAL NAME OF RECIPIENT:	**Various**	IF MULTIPLE RECIPIENTS EXPLAIN:	s.13
ADDRESS:			

s.13

SELECTION PROCESS

DESCRIBE THE SELECTION PROCESS:	s.13

RECIPIENT CAPACITY

DESCRIBE THE RECIPIENT'S CAPACITY TO: • (A) COMPLETE THE PROJECT; AND • (B) REPAY THE FUNDS IF THE STIPULATIONS ARE NOT MET:	s.13
DESCRIBE HOW THE MANDATE OF THE RECIPIENT ALIGNS WITH THE INTENT OF THE TRANSFER:	

RISKS

IDENTIFY RISKS AND STEPS TAKEN TO MITIGATE THE RISKS: EXAMPLE: FINANCIAL, PRIVACY, SAFETY ETC.	s.13
CONSEQUENCES OF NOT FUNDING:	

APPROVALS

EXPENSE AUTHORITY

NAME: **Jennifer McCrea**

_____ _____

SIGNATURE **DATE**

CHIEF FINANCIAL OFFICER

NAME: **Brian Fraser**

_____ _____

SIGNATURE **DATE**

The largest learning event in history

During Computer Science Education Week, December 7-13, 2015

The Hour of Code is coming, again!

Computer science is a foundation for every student. Join us to help millions of new learners start with one Hour of Code. **Sign up at hourofcode.com**

What is the Hour of Code?

A one-hour activity. Students of all ages can choose from a variety of self-guided tutorials, for kindergarten and up. Tutorials work on any modern browser, tablet, smartphone, ***or even with no computer at all***.

Code.org's own tutorials feature Disney's *Frozen*, Scrat from *Ice Age*, Angry Birds, and Plants vs. Zombies. **New tutorials are coming to kick off the 2015 Hour of Code!**

A spark to keep learning computer science. Once students see what they create right before their eyes, they're empowered to keep going.

No experience needed from teachers and students.

A global movement with more than 100 million learners in 180 countries. Anyone, anywhere can organize an Hour of Code event. Tutorials are available in 40 languages.

Why computer science?

Every 21st-century student should have the opportunity to take part in creating technology that's changing our world. The basics help nurture creativity and problem-solving skills, and prepare students for *any* future career. But most schools still don't teach computer science.

"I challenge girls in every single country to learn one Hour of Code"

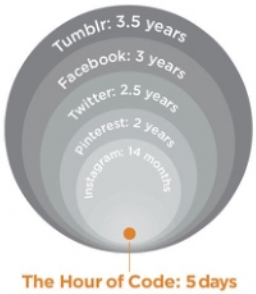
— **Malala Yousafzai**
Nobel Peace Prize winner

Get involved

Host your own Hour of Code. Spread the word with **#HourOfCode!**

The incredible Hour of Code movement:

Fastest to reach 15 million users



Over 100M students have participated at 77,000 events worldwide.

More girls have tried computer science than in the last 70 years.

Celebrities, tech visionaries, and even the President

- Every Apple Store in the world hosted an Hour of Code.
- President Obama wrote a line of code with students at the White House.
- The movement has been featured on Google, YouTube, Yahoo!, Bing and Disney homepages.
- Celebrities Ashton Kutcher and Jessica Alba and tech leaders Sheryl Sandberg, Bill Gates and Jack Dorsey talked with classrooms in live video chats.

"I have **never**, **ever** seen my students so excited about learning."
— Michael Clark
Teacher

Together, we can fix the diversity gap in computer science

By exposing both girls and boys to fundamental computing concepts on a level playing field, starting with the earliest learners, we can inspire today's generation of students to build technology.

Almost half of all Hour of Code participants are girls. 35% of participants are black or Hispanic*

VS

On average, computer science classes are only 18% female and 8% black or Hispanic

Over 300 partners have come together to support this grassroots campaign, including Microsoft, Google, Salesforce, The Walt Disney Company, Target, the Gates Foundation, Khan Academy and more.

Prizes for EVERY organizer

- Every Hour of Code organizer will receive a thank you gift.

Mark your calendars for December 7-13, 2015!

Start at hourofcode.com

The Hour of Code is organized by Code.org, a public non-profit dedicated to expanding access to computer science and increasing participation by women and underrepresented students of color. The Hour of Code is celebrated during the annual Computer Science Education Week in December.

*demographic estimates are sourced from surveys sent to registered Hour of Code organizers in December 2014.

HOUR OF CODE

October 2015 Technology & Innovation Strategy

K12 in Technology Sector Strategy Document (draft GCPE language)**:**

Dedicated programs in the K-12 education system:

- Provide new learning standards in mathematics, sciences, and other curricula for over 600,000 K-12 students across the province, beginning this school year. These standards develop the foundation knowledge and skills for success in the B.C. tech sector and other technology-enabled sectors.
- Promote creative thinking as a core competency across the entire curriculum, including technical and business education.
- Increase the number of high school students earning elective graduation credit for participating in Work Experience electives in the tech sector.
- Give students increased access to dual credit programs in the technology sector, enabling them to earn credits toward high school graduation while also earning credits towards a post-secondary certificate or diploma.
- Support student opportunities to learn coding in school and outside school through courses and special activities such as the Hour of Code.

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Potential Budget 2016 Questions Tech Strategy

Friday, February 12, 2016
10:55 AM

Subject	**Potential Budget 2016 Questions Tech Strategy**
From	Morel, David P MTIC:EX
To	Boyd, Wes MTIC:EX; Champion, Denise GCPE:EX; Coad, Jeremy A MTIC:EX; Coney, David ENV:EX; Davidson, Heather (ADM) HLTH:EX; Giles, Alison GCPE:EX; Gleeson, Kelly T GCPE:EX; Greek, Kendra JTST:EX; Hammond, James MIT:EX; Higgs, Jeremy JTST:EX; Hume, David GCPE:EX; Laaksonen-Craig, Susanna ENV:EX; Lansdell, Hayden MIT:EX; Little, Christine SBRT:EX; Loughran, Tony D AVED:EX; MacDonald, Scott D JTST:EX; McCrea, Jennifer EDUC:EX; Mihlar, Fazil AVED:EX; Mingay, Rob JTST:EX; Sawchuk, Bindi MIT:EX; Schollen, Tasha GCPE:EX; Schuckel, Victoria M HLTH:EX; Stewart, Melanie CSCD:EX; Winkelmans, Tim EDUC:EX
Cc	Ahmed, Sarf MTIC:EX
Sent	Friday, February 12, 2016 10:52 AM

Hi All

FYI below is the draft response in case there are questions at lock up about expenditure/costs related to Tech Strategy. Let me know if you have any comments.

Thanks

David Morel

BC Tech Strategy

1. How is the BCTech strategy being funded ?

- It is a cross government multi-year strategy with various ministries responsible for implementing it.
- The strategy focuses on Capital, Talent and Marketplace
- A $100m venture capital fund has already been announced in December to provide capital to industry. Work is underway to select a fund manager.
- Initiatives to support Talent and marketplace for BC tech companies are underway with ministries involved allocating necessary resources, where required, from their budgets. For

example; Ministry of Education will work with the school districts to introduce coding in classrooms; Ministry of Advanced Education is refocusing coop placements to assist the tech industry and classifying tech jobs as high priority making them eligible for priority funding; BC Tech companies will be exploring new marketing opportunities including selling to BC government. BCIC's Accelerator network is already in place to support it.

- Ministries who purchase goods and services which can be provided by BC tech companies are creating opportunities for government purchase managers and the BCTech sector to get to know each other. MTICS and BCIC are supporting this through B2B meetings, as well as concepts such as Developer's exchange. MTICS budget for Tech and Innovation has been increased by $850K To assist in these.
- Okanagan Centre for Innovation will be operational in the coming fiscal year in Kelowna. Province will be contributing $6million towards the capital costs in this public private partnership.
- We will also hold another BCTech summit. Majority of its funding will come from sponsorships and registrations with MTICS contributing the rest from its base budget.

Key #BCTECH Strategy Investments

New/Expanded	Ongoing/Existing
• $100 million for the BC Tech Fund (venture capital) • An anticipated realignment of $450 million in post-secondary operating grants for educating in-demand occupations, including technology • $4.5 million over the next five years to open a technology stream within the Canada Job Grant Program so tech companies can train and re-train current	• $55 million in recent weeks to ensure leading edge research through the Michael Smith Foundation and BC Cancer Agency • $33 million in tax credits annually through the Digital Animation and Visual Effects tax credit • Since June 2001, the BC Knowledge Development Fund has awarded over $524 million

employees. • In recent weeks we announced an $80 million upgrade to the undergraduate teaching laboratories at the University of British Columbia that will allow more growth and opportunity in life sciences that support a range of vibrant sectors that contribute to a diverse economy.	for more than 1,000 research infrastructure projects. We remain committed to substantive research at our universities in keeping with provincial job creation and commercialization goals.

Re: Every child will experience coding...

Tuesday, December 15, 2015
3:52 PM

Subject	**Re: Every child will experience coding...**
From	Hawkes, Mark EDUC:EX
To	Winkelmans, Tim EDUC:EX
Sent	Tuesday, December 15, 2015 3:00 PM

s.13

s.13

Mark

From: Winkelmans, Tim EDUC:EX
Sent: December-14-15 9:15 AM
To: Hawkes, Mark EDUC:EX
Subject: FW: Every child will experience coding...

Hi, Mark
s.13

From: Ustina, Barb GCPE:EX
Sent: Friday, December 11, 2015 4:05 PM
To: Winkelmans, Tim EDUC:EX; Lowther, Brett GCPE:EX
Subject: RE: Every child will experience coding...

s.13

Barb Ustina
250 818-1329

From: Winkelmans, Tim EDUC:EX
Sent: Friday, December 11, 2015 3:21 PM
To: Lowther, Brett GCPE:EX
Cc: Ustina, Barb GCPE:EX
Subject: RE: Every child will experience coding...

s.13

From: Lowther, Brett GCPE:EX
Sent: Friday, December 11, 2015 3:15 PM
To: Winkelmans, Tim EDUC:EX
Cc: Ustina, Barb GCPE:EX
Subject: RE: Every child will experience coding...

s.13

brett

From: Winkelmans, Tim EDUC:EX

Sent: Friday, December 11, 2015 3:08 PM
To: Ustina, Barb GCPE:EX; Lowther, Brett GCPE:EX
Subject: RE: Every child will experience coding...

s.13

From: Ustina, Barb GCPE:EX
Sent: Friday, December 11, 2015 2:21 PM
To: Winkelmans, Tim EDUC:EX; Lowther, Brett GCPE:EX
Subject: RE: Every child will experience coding...

Hi Tim,
s.13

Dedicated programs in the K-12 education system

- Support student opportunities to learn coding in school and outside school through courses and special activities such as the Hour of Code.
- Beginning this school, over 600,000 K-12 students across the province will experience new learning standards in mathematics, sciences, and other curricula. These standards develop the foundation knowledge and skills for success in the B.C. tech sector and other technology-enabled sectors
- Promote creative thinking as a core competency across the entire curriculum, including technical and business education
- Increase the number of high school students earning elective graduation credit for participating in Work Experience electives in the Tech Sector
- Give students increased access to dual credit programs in the technology sector enabling them to earn credits toward high school graduation while also earning credits towards a post-secondary certificate or diploma

Barb Ustina
250 818-1329

From: Winkelmans, Tim EDUC:EX
Sent: Friday, December 11, 2015 2:10 PM
To: Lowther, Brett GCPE:EX; Ustina, Barb GCPE:EX
Subject: FW: Every child will experience coding...

s.13

From: Stanford, Susan MTIC:EX
Sent: Friday, December 11, 2015 1:40 PM
To: Winkelmans, Tim EDUC:EX
Subject: Every child will experience coding...

Hi Tim,
s.13

Thanks,
Susan

Susan Stanford MBA MAL
Executive Director
Strategic Initiatives and Partnerships Division, OCIO
Ministry of Technology, Innovation and Citizens' Services
Victoria, BC | T 250.580.7459
www.cio.gov.bc.ca

Re: Question

Friday, January 22, 2016
9:21 AM

Subject	**Re: Question**
From	melyyma@gmail.com
To	Winkelmans, Tim EDUC:EX
Sent	Thursday, January 21, 2016 10:50 PM

Thanks Tim for the thoughtful response! I was already aware of many of the points listed, but was just wondering if I missed anything given such a broad promise by the Premier and her statement of envisioning such program will be mandatory at some point.
Given MInister Bernier's recent comments to the media and his firm assertion that no new funding will be allocated, I am now even more concerned that there wasn't a detailed roll-out plan and resourcing in place prior to a public announcements of this scale. If you look at the many other jurisdictions that have successfully implemented CS education, they had planning and funding in place prior to such public announcements - UK, Chicago, NB and NS are examples. Their plans included some of the items you listed below, but also encompassed broader and more comprehensive tactics that addresses multiple stakeholder group in addition to substantial funding and partnerships - and even they still had issues along the way.
Furthermore, there is strong evidence that unfunded and non-comprehensively planned programs do not work. I corresponded with the founder of Code.org today. They are the Hour of Code folks and the partner that rolls out many of the US coding education implementations. He mentioned that in Texas, they had a similar type of announcement where the program was unfunded with little planning. The program flopped and nothing happened. Whereas in Arkansas where they had with proper planning and resourcing, they saw a spike in CS enrollment.
At the end of the day, I'm truly hoping that this rollout will be a success.
Regards,
Melody

On Tue, Jan 19, 2016 at 9:07 AM, Winkelmans, Tim EDUC:EX <Tim.Winkelmans@gov.bc.ca> wrote:
Hi, Melody

This is all for non-attribution as far as media goes.

We have put a million dollars into the system to support implementation of the new curriculum, including this one. A lot of this will be going to release teachers for professional development. We're funding CUEBC to create a coding resource guide for teachers. Many of the resources needed for coding are free or low-cost, and even hardware cost barriers are low. What we've seen is that districts that make this a priority make it work.

The actual curriculum draft puts computational thinking on the same basis as textiles, foods, "shop classes", and other applied skills in grades 6-9, and many schools offer these on a rotational or team-

teaching basis, so we do not need to train up every teacher (although it would be great if they were all interested).

RE bandwidth, we are upgrading the infrastructure to schools through the Next Generation Network initiative. It's a phased upgrade, so it will be a couple of more years to finish. Prince George, for example, should be upgraded in the second quarter of this year.

We will also continue supporting coding camps (will try to scale up), work experience and dual credit opportunities by funding on-the-ground coordinators (these are mostly in the north right now), and partnerships between schools and post-secondary institutions.

I hope this helps.

-----Original Message-----
From: Melody [mailto:melyyma@gmail.com]
Sent: Monday, January 18, 2016 6:09 PM
To: Winkelmans, Tim EDUC:EX
Subject: Question

Tim,

I saw the BC Tech Strategy announcement on kids coding today. I'm thrilled that there is public support from govt on this. My phone has been ringing off the hook with press interview requests all day.

However, I wanted to ask you something - are there any plans for substantial backend support and funding for this going forward that I'm currently unaware of? I worry about the grand statements made about making coding mandatory in school and when communities like Prince George doesn't even have enough bandwidth for a coding event like Codecreate (we did it offline). I saw that Hour of Code was mentioned, but who will be leading the campaign this year and the years forward?

As you might be aware, I'm trying to stepping back a bit from this coding initiative this year to focus on my career. But, I'm hoping that there are resources in place to ensure continuity and expansion in all the work that we have done in the past year.

Thanks,
Melody

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BACKGROUND

Computer programming, or coding, as it is more commonly referred to, is rapidly becoming a new literacy across the globe.

CODING INITIATIVES IN OTHER JURISDICTIONS

Estonia was the first country to implement a nation-wide coding education initiative: *ProgeTiiger* (or Programming Tiger) in 2012. The program was met with strong resistance by teachers, who cited lack of training and computer hardware as their main concerns.

United Kingdom

In 2014, the UK announced its own coding initiative: the xx.

New Brunswick/Nova Scotia

The government of New Brunswick gave $250,000 to Brilliant Labs, a non-profit organization dedicated to….

New Applied Design, Skills and Technologies Curriculum

Coding, or computer programming, is one aspect of Information and Communications Technology (ICT), which is one of four subject areas contained in the curriculum formerly known as Applied Skills, now Applied Design, Skills and Technologies. The others are Technology Education, Home Economics, and Business Education. Computer programming is one application of computational thinking, which is important for developing a well-rounded individual who can think, reason logically, adapt to new situations, and solve problems.

The new ADST curriculum emphasizes design thinking and hands-on, project-based learning. Students should learn computational thinking in the elementary grades, then apply that mindset to learning simple coding in the middle grades, moving on to more complex coding in senior high school, if they have found they are interested in it.

At its core, the curriculum will teach students how to come up with ideas to solve a problem, do research, design, prototype, test, make and share…and these curricular competencies can be part of any subject.

For now, the curriculum content related specifically to computational thinking and coding is found in Grades 6-9:

Grades 6/7:	
Content	**Elaborations**
Computational Thinking STUDENTS ARE EXPECTED TO KNOW THE FOLLOWING: • simple algorithms that reflect computational thinking • visual representations of problems and data • evolution of programming languages • visual programming	1. simple algorithms: for sorting, searching, sequence, selection, and repetition; specific statements to complete a simple task; cryptography and code breaking (e.g., cyphers) 2. visual representations: graphs, charts, network diagrams, info graphics, flow charts, lists, tables, or arrays 3. evolution of programming languages: historical perspectives, evolution (e.g., Ada Lovelace, punch cards, Hollerith, Grace Hopper, Alan Turing, Enigma, cyphers) 4. visual programming: for example, Kodu, Scratch
Grade 8:	
Computational Thinking STUDENTS ARE EXPECTED TO KNOW THE FOLLOWING: • software programs as specific and sequential instructions with algorithms that can be reliably repeated by others • debugging algorithms and programs by breaking problems down into a series of sub-problems • binary number system (1s and 0s) to represent data • programming languages, including visual programming in relation to text-based	1. visual programming: for example, Scratch, Alice, Greenfoot, BlueJ 2. text-based programming: for example, HTML 3. programming modular components: for example, Arduino, LEGO Mindstorms

programming and programming modular components	
Grade 9:	
Information and Communications Technologies STUDENTS ARE EXPECTED TO KNOW THE FOLLOWING: • text-based coding • binary representation of various data types, including text, sound, pictures, video • drag-and-drop mobile development • programming modular components	1. text-based coding: HTML, CSS, JavaScript 2. drag-and-drop mobile development: for example, Vizwik 3. modular components: for example, Arduino, Raspberry Pi, LEGO Mindstorms

The Grade 10-12 curriculum is still under development and won't be available until the summer.

Hour of Code/Codecreate Events 2015

The International Hour of Code event is…

To support the Hour of Code for 2015 and expand on BC's participation, the Ministry partnered with the private sector, school districts, and post-secondary. Under the brand "Codecreate", four, day-long student coding events were held in major cities across the province: Vancouver, Victoria, Prince George and Kelowna.

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TERMS OF REFERENCE

K-12 CODING INITIATIVE ADVISORY COMMITTEE

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BACKGROUND

The entrepreneurial drive in B.C. has created tech companies with nine-figure revenues, a vibrant start-up ecosystem, and world-class technology used by the most prestigious companies in finance, information technology, aerospace, and retail.

The tech sector is a key driver of growth for the provincial economy, expanding faster than the economy at large. Employing over 86,000 people, with an average wage that is 60% higher than B.C.'s industrial average, the sector has a principal role in the BC Jobs Plan.1 The tech sector has outpaced the overall provincial economy for eight of the past ten years. The 9,000 technology companies in British Columbia in 2013 combined to generate over $23 billion in revenue, adding over $13 billion to B.C.'s GDP. That same year, over 700 new technology companies came into existence in the province.

Computer programming, or coding, is rapidly becoming a new literacy across the globe. As part of the BC Technology Strategy announced by Premier Christy Clark on January 18th, 2016, the new Applied Design, Skills and Technologies (ADST) curriculum for K-9 will give BC students an opportunity to learn computational thinking skills and experience coding by grade 9. Government's goal is that students will graduate with the skills they need for a modern economy that includes coding.

The new ADST curriculum emphasizes design thinking and hands-on, project-based learning. The curriculum is organized into modules including: Computational Thinking, Computers and Communication Devices, and Digital Literacy. Computational Thinking is essential for the development of well-rounded individuals who can reason logically, adapt to new situations, and solve problems.

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Page 337 to/à Page 338

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Technology Strategy and Coding

Current Status in Schools (Based on a June 2015 survey of districts and other information)**:**

- Minimal level of activity across the K12 system;
- **Many high schools offer programming**, digital media, and other technology-related courses;
- There are a few **cases of exemplary practice**. Examples:
    - South Island districts that are working with **local gaming industry companies to provide work experience for students.**
    - Some districts are providing "Maker" events, which often include a coding or robotics component.
- **Many coding resources are available to schools and students free of charge**, i.e. Khan Academy instructional videos. Various non-profit organizations also put on coding events periodically throughout the year.

New Curriculum

Two years ago, the Ministry released a **Digital Literacy Framework,** a set of guidelines for teachers to support the interest, attitude and ability of learners to appropriately use digital technology and communication tools.

- The Framework has 6 categories; one of these, **Technology Operations and Concepts,** addresses coding-related outcomes for students.

Within the new curriculum, **coding is included in Applied Design, Skills, and Technologies** (formerly Applied Skills).

- The Ministry's approach from K to Grade 5 is use technology to enhance teaching and learning of other curricula.
- 3 new modules are being developed for Grades 6-9:
    - **Digital Literacy/Citizenship**,
    - **Computational Thinking** (precursor to coding at higher grades), and
    - **Computers and Communications Devices**.
- **For Grades 6/7**, this represents **three brand new curricula where there is currently none**.
- **In Grades 8/9**, it represents an **updated and much expanded curriculum** compared to the current Information and Communications Technology (ICT) curriculum.

s.13

The Techology and Innovation Strategy

The purpose of this government-wide strategy is to identify ways to support the B.C. Technology Sector.

- Funded Initiatives
    - We are going to **extend our Shoulder Tappers program** to encourage experiences in the ICT sector, which will **support dual credit and work experience options** for students;

s.13

    - New **STEM** (Science, Technology, Engineering and Mathematics) **and Careers Education curricula**, which speaks to the learning experiences kids have;
    - **Career Zones** resource documents for career educators;

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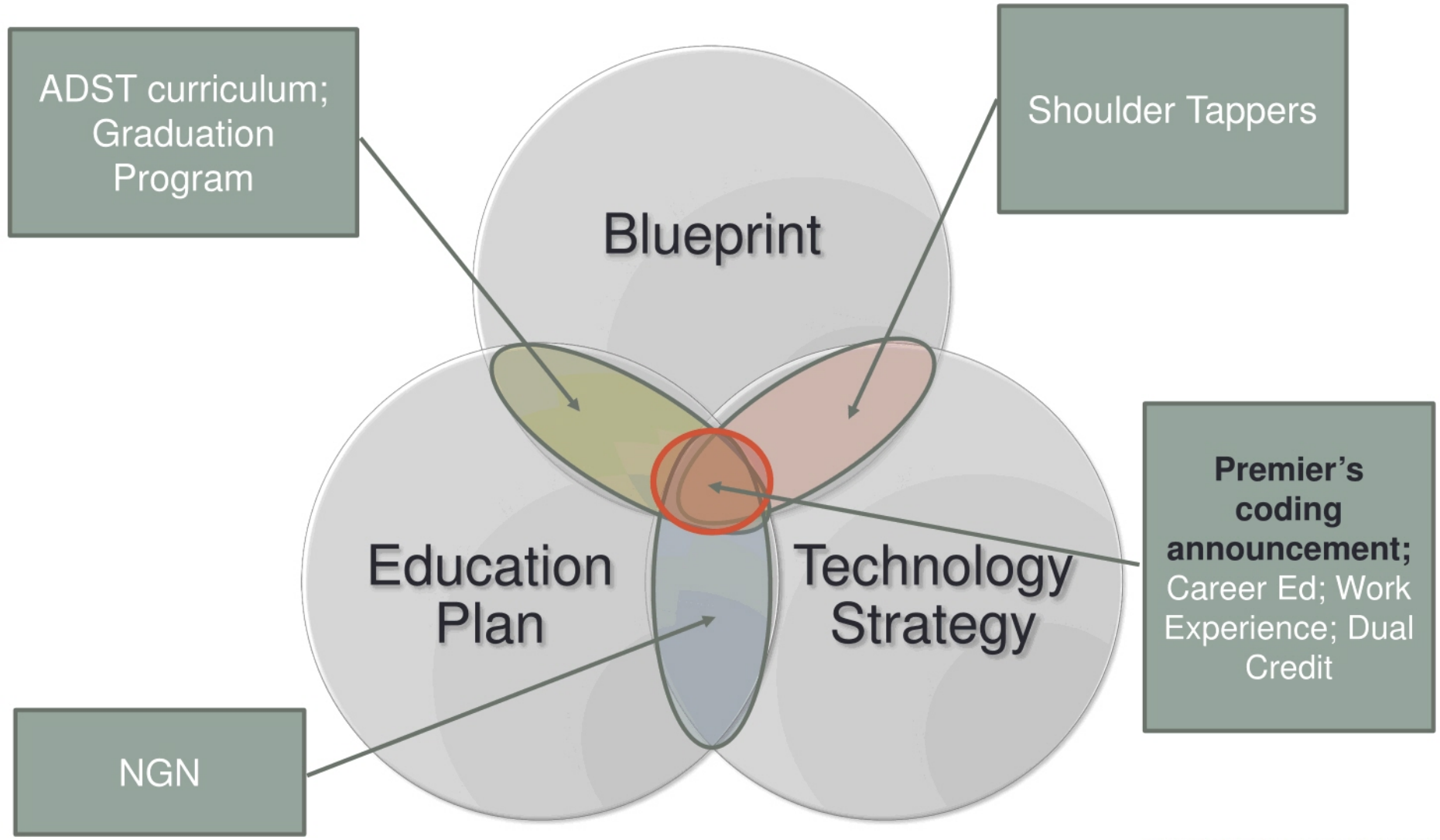
TECHNOLOGY STRATEGY

"Coding" focus

Context


ADST curriculum; Graduation Program
Shoulder Tappers
Blueprint
Education Plan
Technology Strategy
Premier's coding announcement; Career Ed; Work Experience; Dual Credit
NGN

Technology Strategy: Education Deliverables

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Pillar	Commitment	Actions
Talent	New Applied Design, Skills, and Technologies curriculum	Curriculum transformation
	Every student will have opportunity to learn coding by end of Gr. 9	
	Support student opportunities to learn coding in/out of school (ex: Hour of Code).	BC Youth Coding Initiative
	New K-12 curriculum in math, science, careers.	Curriculum transformation
	Promote creative thinking across entire curriculum.	
	More work experience and dual credit in tech sector.	Shoulder tappers; Focus on IT (FIT) Implementation
Markets	Complete Next Generation Network implementation.	Underway, complete in 2016

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New Brunswick Model: Brilliant Labs

Vision:
"To provide every child in New Brunswick, and the Maritimes, with the opportunity to learn to code, to graduate already a part of a vibrant and growing business and technology community, and with the right skills and confidence to create jobs for themselves, here."

Creation:
Agency created with funding from government and private sector. Start-up from government: $250,000 for founders' meetings, interim executive director, etc.

Strategy:
Secondment of educators to provide direct help within classrooms and professional development for teachers by modeling how to work directly with students by integrating technology and coding within the curriculum and employing 21st century learning and teaching strategies.

Governance:
Brilliant Labs is governed by a Board of Directors and an overall Executive Director, and supported by a Provincial Steering Committee

2015-2018 Budget:
$2,825,000.00

August 2015 Technology Strategy and Coding

Current Status in Schools (Based on a June 2015 survey of districts and other information)**:**

s.13

- **Many high schools offer programming**, digital media, and other technology-related courses.
- There are a few **cases of exemplary practice**. Examples:
  - South Island districts that are working with **local gaming industry companies to provide work experience for students.**
  - Some districts are providing "Maker" events, which often include a coding component.
- **Many coding resources are available to schools and students free of charge**, i.e. Khan Academy instructional videos. Various non-profit organizations also put on coding events throughout the year.
- Two years ago, the Ministry released a **Digital Literacy Framework,** a set of guidelines for teachers to support the interest, attitude and ability of learners to appropriately use digital technology and communication tools.
  - The Framework has 6 categories; one of these, **Technology Operations and Concepts,** addresses coding-related outcomes for students.

New Curriculum

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Grades K-2:
s.13

Grades 3-5:
s.13

Grades 6-9:
s.13

Grades 10-12:
s.13

The Techology and Innovation Strategy

The purpose of this government-wide strategy is to identify ways to support the B.C. Technology Sector.

- Funded Initiatives

s.13

- Unfunded Initiatives

s.13

Industry Involvement

- The **sector establishes recognized certifications** that many students can achieve while still in high school (Cisco, Microsoft, COMPTIA, for example). High schools in BC have locally-developed courses leading to these certifications. Achieving these certifications is also a foundation of the *FIT* program.
- **Industry representatives provided** the Ministry with **high-demand talent needs** for the *Career Zone: ICT* career education resource completed in May 2015.
- **Industry provides work-experience opportunities for high school students**, as the multimedia employers on southern Vancouver Island have done. This should increase through shoulder-tapper activities.
- **Industry partners with libraries and schools to support coding events** by contributing expertise or financial support.

Next 1-3 Years

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Expected outcomes:

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