



Assessing Computational Thinking

Science World's Mission

Through science and nature, we ignite wonder and empower dreams.

Science World BC is a charitable organization that aims to engage British Columbians in science and to inspire future science and technology leadership throughout our province.



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Workshop intentions

- To develop a better understanding on how to assess the ADST curriculum
- To think about planning and assessing CT
- To think about planning and assessing in general

Chat

- What is your definition of computational thinking?
- How are you using computational thinking in your classroom?



Computational Thinking

A critical thinking process

- Involves logical reasoning
- Decomposition: break down problems into discrete steps
- Develop algorithms
- Find patterns and generalize
- Use abstractions
- Involves evaluation

Decomposition

Breaking down complex data, problems, or processes into smaller tasks or steps.

When do you use decomposition in your daily life?



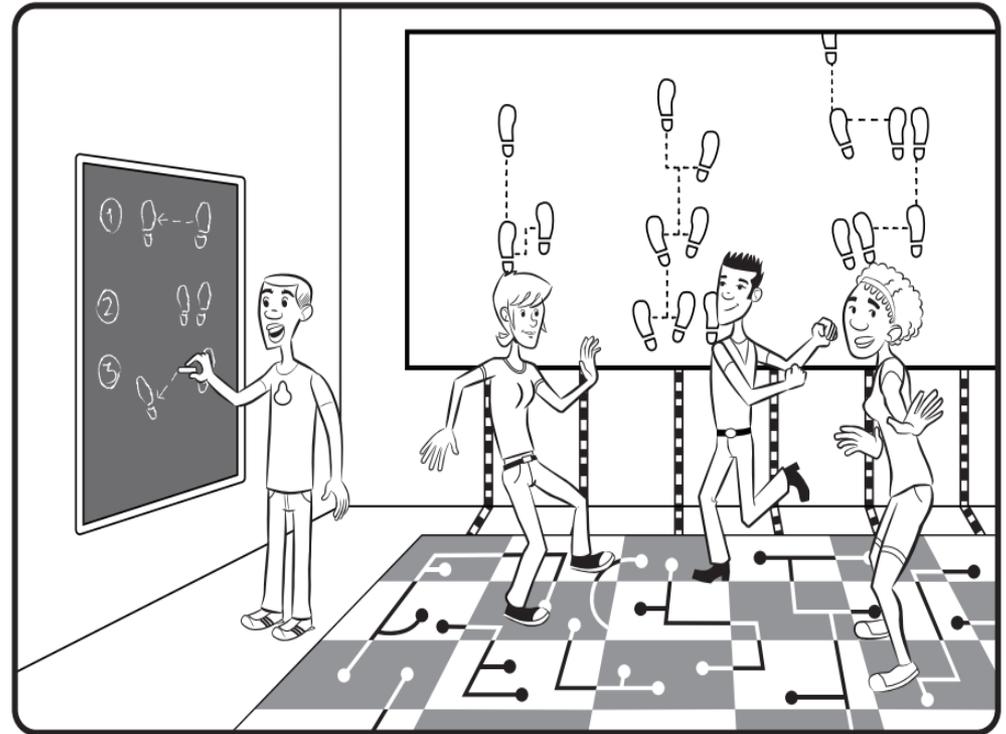
Decomposition involves identifying those smaller tasks and how they fit together.

Algorithmic thinking

A way of getting to a solution through the clear definition of the steps needed.

In order to design an algorithm, you need to understand your goal. You also need to understand the constraints of the system.

When do you use algorithmic thinking in your daily life?

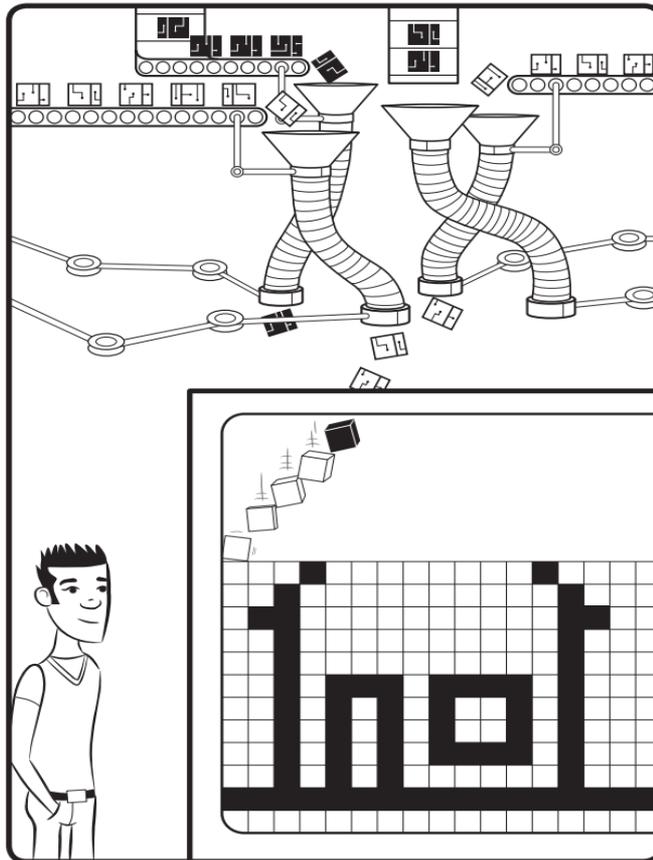


Algorithm Design

Like an algorithm, a dance is a set of steps that can be followed by others to get the same result.

Patterns and Generalization

Identifying patterns, trends, and regularities in data to make predictions, create rules, and solve more general problems.

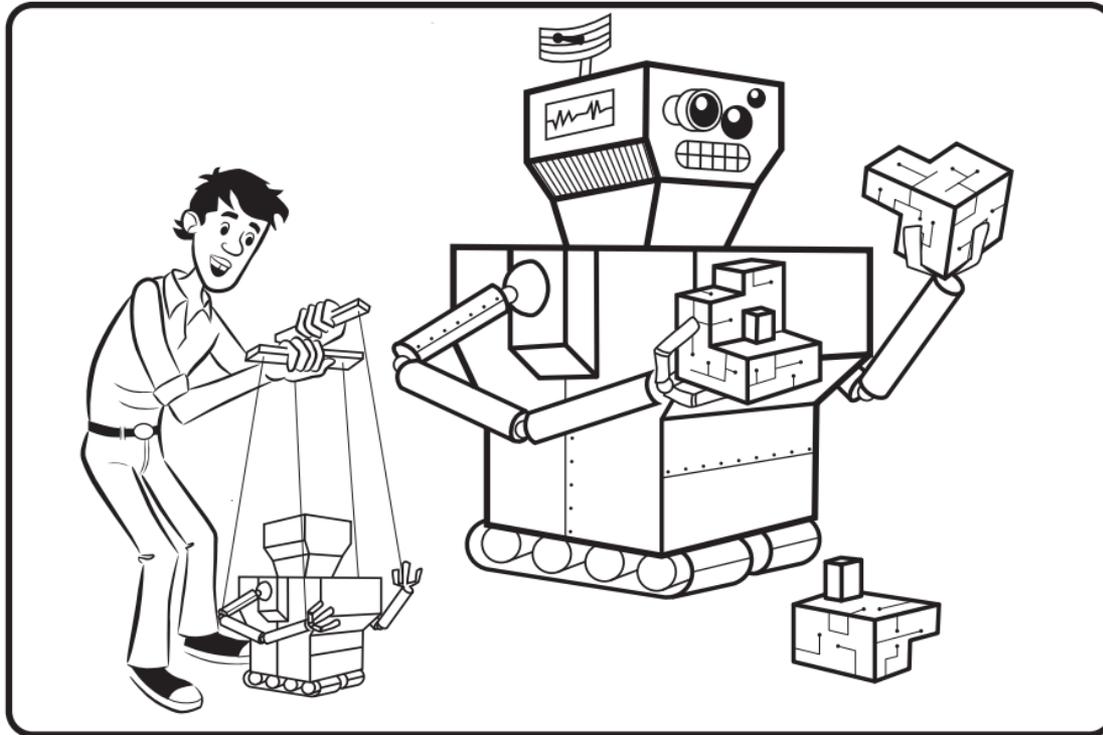


Pattern Generalization and Abstraction

When do you use patterns and generalization in your daily life?

Abstraction

Simplifying things so we can manage complexity.



When do you use abstraction in your daily life?

Carefully selecting the qualities we care about and ignoring the rest of the details is the key to abstraction.

Chat

- What do you know about assessment in CT?
- What do you want to know about assessment in CT?
- What do you do? What do you want to do better? (It's okay if you haven't done anything yet!)





Assessment requirements

BC Ministry of Education

K to 3	4 and 5	6 to 9	10 to 12 (4 credits in ADST or Arts education)
<p>For Applied Design, Skills and Technologies, the summative formal report at the end of the year will include descriptions of progress in relation to the learning standards set out in the curriculum.</p>		<p>In grades 6 -9, formal reports will include letter grades and written reporting comments, where deemed appropriate, to indicate students' levels of performance in relation to the learning standards set out in the Applied Design, Skills and Technologies curriculum.</p>	<p>Student progress reports for students in grades 10 to 12 must, in relation to expected learning outcomes set out in the curriculum, contain letter grades and, where deemed appropriate, written reporting comments.</p>

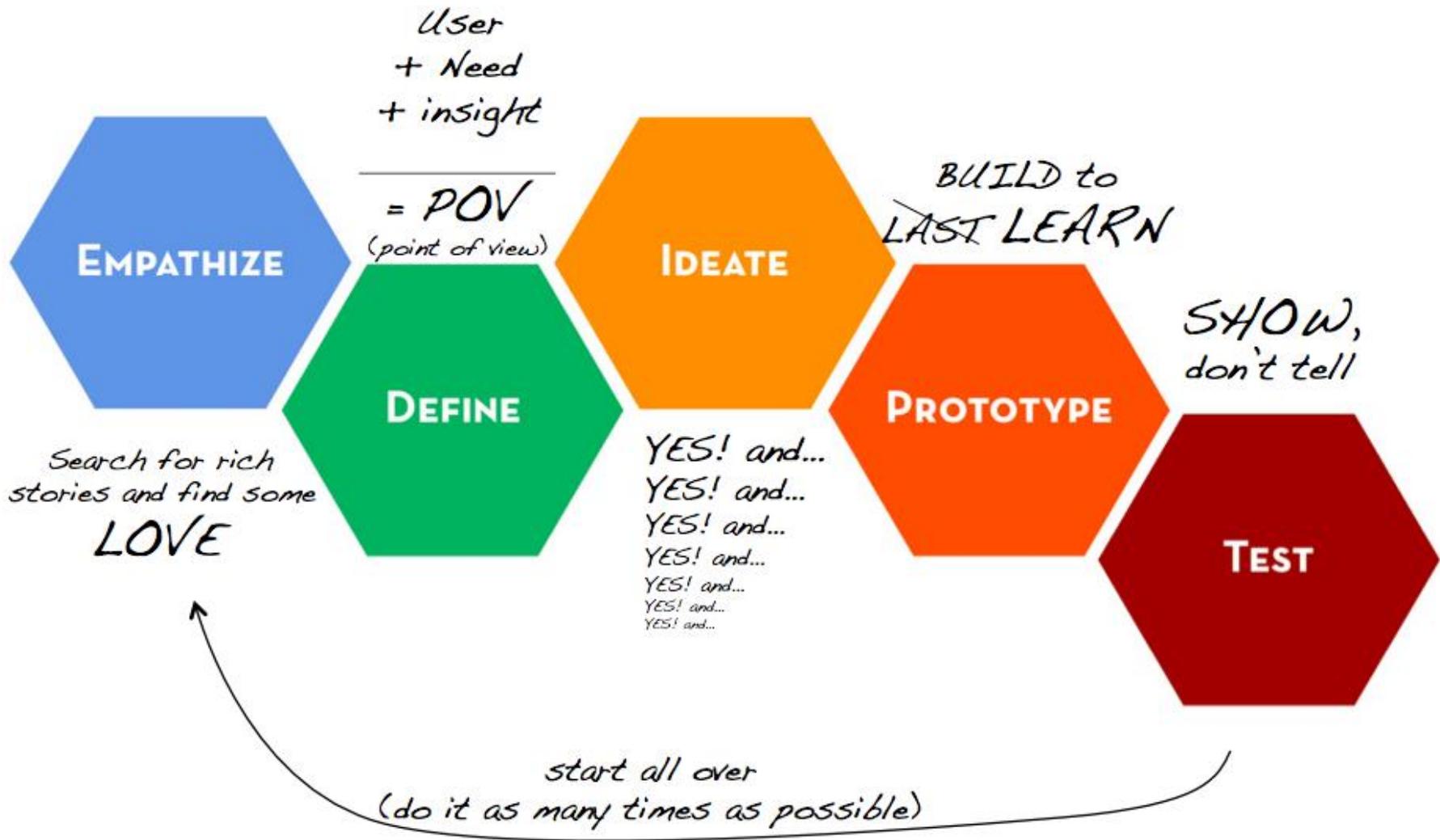
Curriculum content

Foundations		Explorations			Specializations
K to 3	4 & 5	6 & 7	8	9	10 to 12
<p>Students are expected to use the learning standards for Curricular Competencies from ADST in combination with grade-level content from other areas of learning in cross-curricular activities to develop foundational mindsets and skills in design thinking and making.</p>		<p>Minimum of 3 modules per year in each of grades 6 and 7.</p> <p>Schools may choose from among the 12 modules listed or develop new modules that use the Curricular Competencies of ADST 6-7 with locally developed content.</p>	<p>Equivalent of a full-year “course” in Applied Design, Skills, and Technologies.</p> <p>This “course” can be made up of one or more modules.</p>	<p>Equivalent of a full-year “course” in Applied Design, Skills, and Technologies.</p> <p>This “course” can be made up of one or more modules.</p> <p>There are more Content learning standards for Grade 9, as schools often offer these as full courses.</p>	<p>Specialization modules with content.</p> <ul style="list-style-type: none"> - Computer Studies 10 - Media Design 10 - Web Development 10 - Graphic production 11 & 12 - Robotics 11 & 12 - Computer Information Systems 11 & 12 - Computer Programming 11 & 12 - Media Design 11 & 12

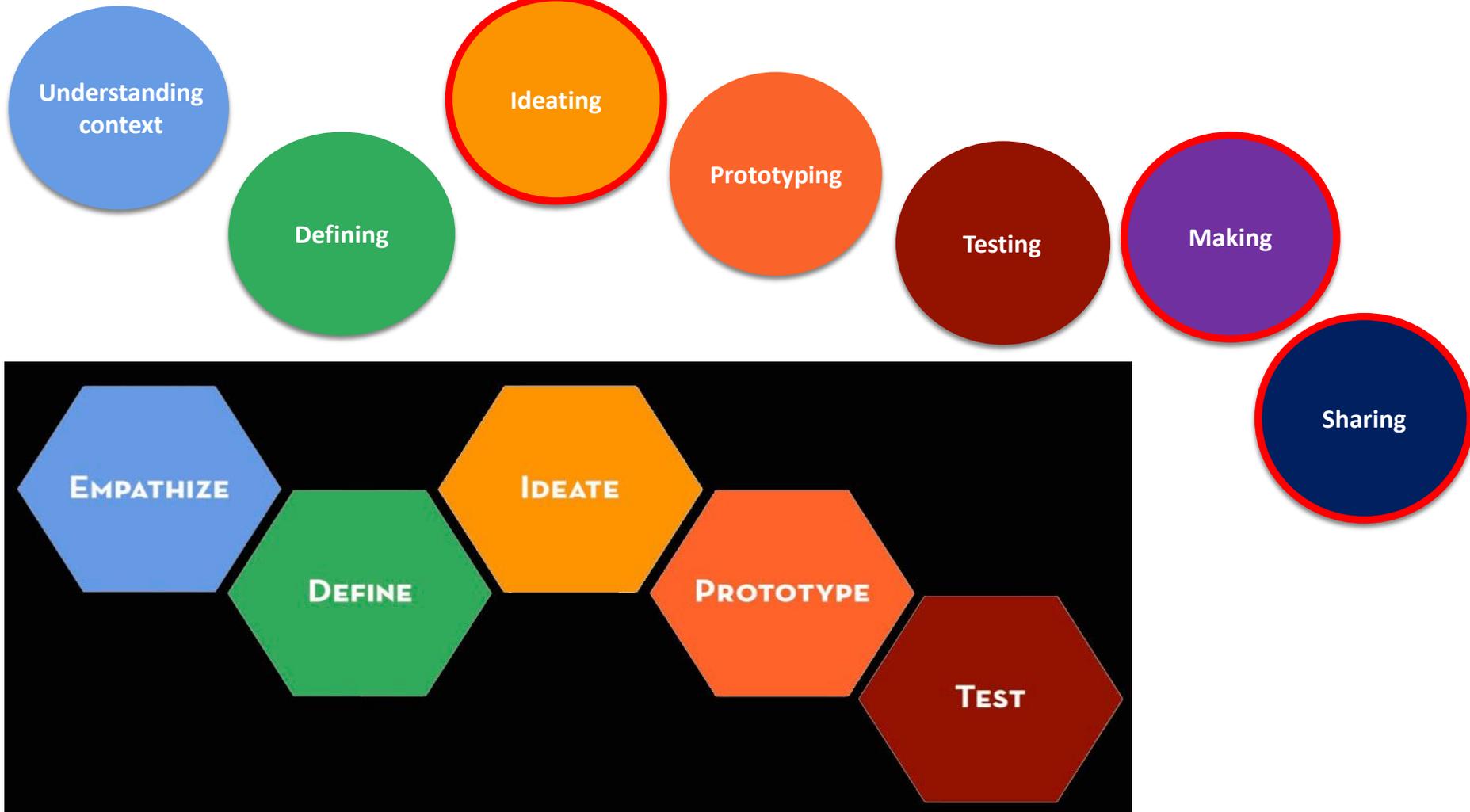
Assessment feedback loop



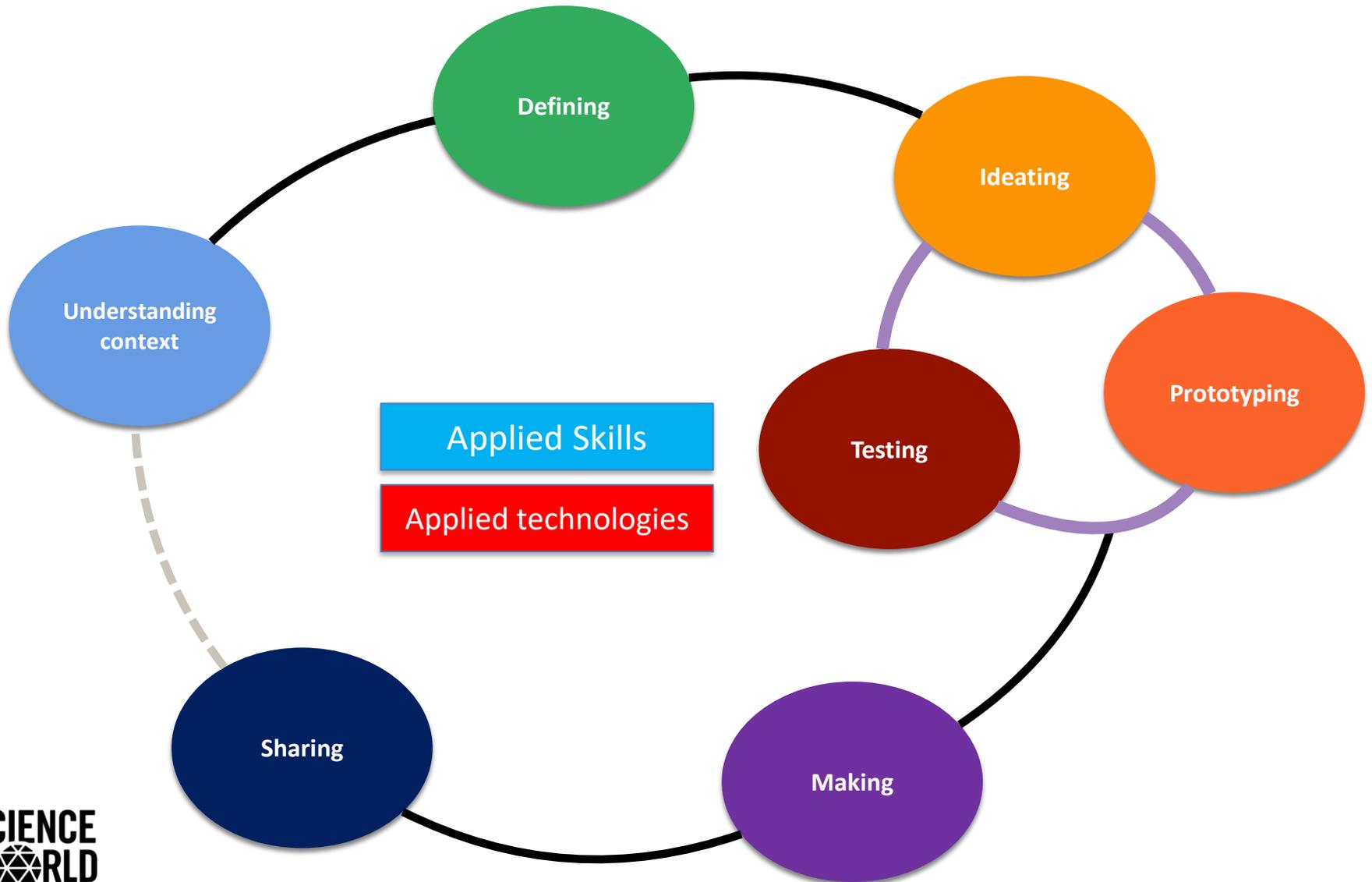
My design thinking CHEAT SHEET



Applied Design



Applied Design, Skills and Technology



Core competencies



Communication

- Communicating
- Collaborating



Thinking

- Creative Thinking
- Critical and Reflective Thinking



Personal and Social

- Personal Awareness and Responsibility
- Positive Personal and Cultural Identity
- Social Awareness and Responsibility



Assessment matching activity

We will be using:

- Five lesson cards (in PDF)
- Curriculum competencies [listed here](https://forms.gle/7gtpyxx5CrBtwubC8) (<https://forms.gle/7gtpyxx5CrBtwubC8>)
- Core competencies [described here](https://curriculum.gov.bc.ca/competencies) (<https://curriculum.gov.bc.ca/competencies>)

In groups of 3, find the curriculum competencies, can work with each of the lessons. What core competencies work with each lesson?

What do you notice? What do you wonder?

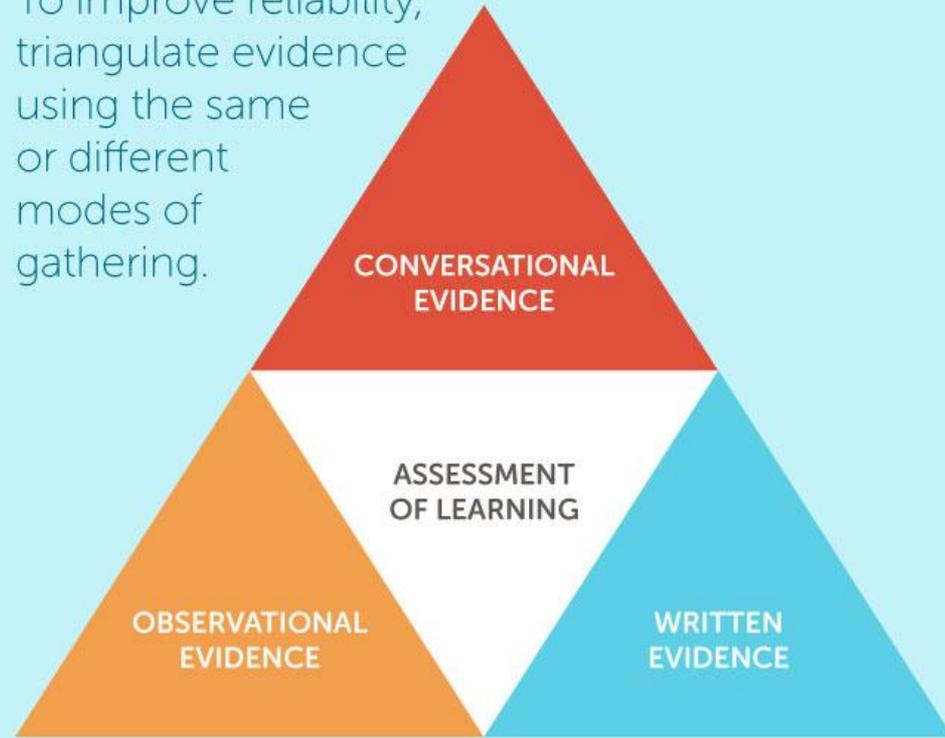


Triangulation in assessment

SUMMATIVE

gather evidence
to certify proficiency
and understanding

To improve reliability,
triangulate evidence
using the same
or different
modes of
gathering.





Inclusive assessment practices

Questions to guide your brainstorming:

- What are age and ability specific ways that students can demonstrate their knowledge/show their learning?
- In what ways can our most at risk learners show their learning (ELL, non verbal, etc.)
- What are the assessment pieces for you as a teacher, and what are the self-assessment pieces for your students?



How a student can demonstrate what they know

- Podcast
- Video
- Screenshot *
- Photo Essay *
- Voice recording
- Animation
- Journal / Learning Log
- Mind Map
- Collage
- Drawing
- Experiment
- Model
- Scrapbook
- Mock product pitch
- Poster
- Show and tell
- Word cloud
- Website
- Blog
- Tutorial
- Timeline
- Song
- Speech
- Slideshow
- Exit Slip
- Dance
- Comic strip
- Game
- Flowchart
- Presentation
- Scavenger Hunt

Exit Slip

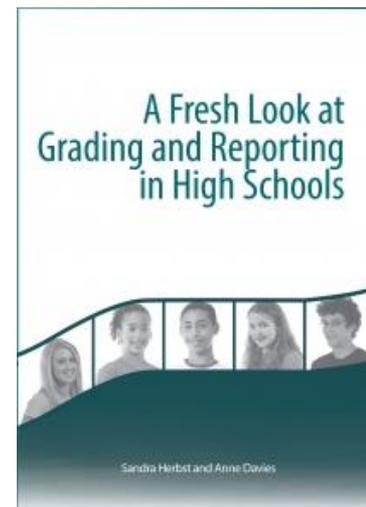
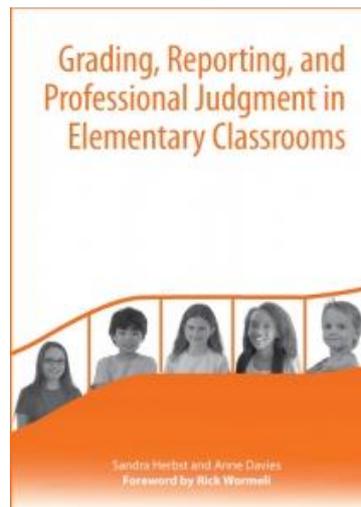
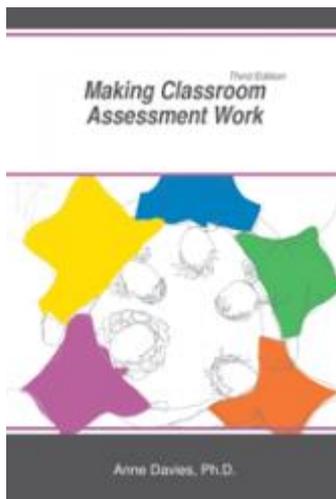
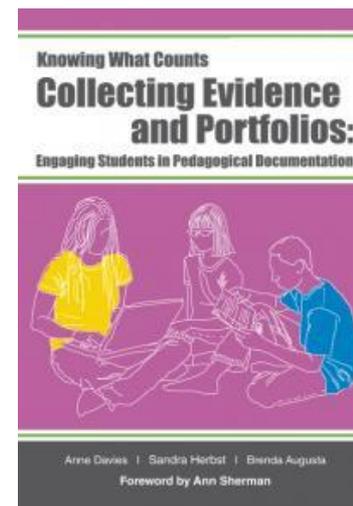
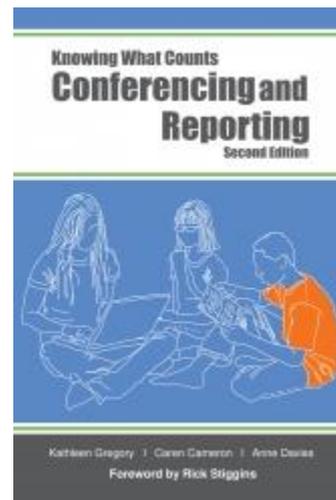
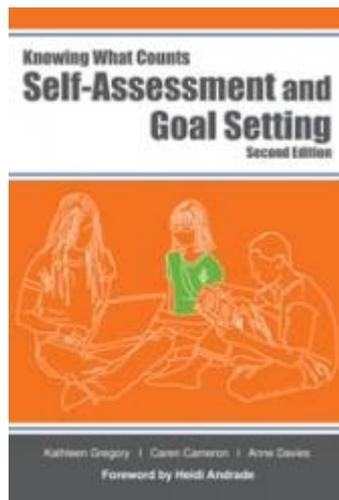
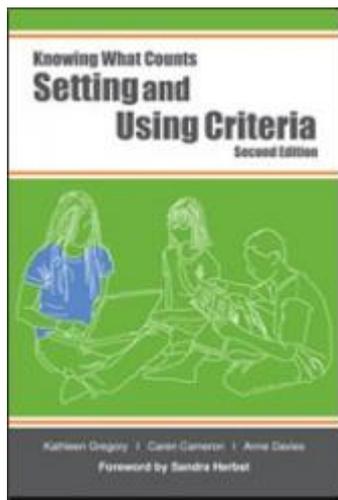
Exit Slip

What questions do you still have about assessing Computational Thinking?

How will you integrate CT assessment into your teaching practice?

Name: _____

Date: _____



Assessment strategies

Artifact-based interviews	Design scenarios	Learner documentation
<p>Learners converse about their computational thinking process, using work samples to guide the conversation.</p>	<p>Learners work with projects using four different perspectives: critiquing, extending, debugging, and remixing.</p>	<p>Learners reflect on their learning.</p>
<ul style="list-style-type: none">• Sample interview protocol	<ul style="list-style-type: none">• Sample projects	<ul style="list-style-type: none">• Journal, sample prompts here and here.
<ul style="list-style-type: none">• Sample rubric	<ul style="list-style-type: none">• Students are asked to:• Explain what the project does• Describe how it could be extended• Fix a bug• Remix the project by adding a feature	<ul style="list-style-type: none">• annotations in their work explaining design and implementation decisions
		<ul style="list-style-type: none">• Create a video of their process with screen capture software

Science World resources

We have lots on our web site!

Check out Science World's [educator resources page](#)

[Scientist and Innovators in the Schools](#) brings scientists to your classroom for FREE!

Your students can win amazing prizes through [BC Green Games!](#)

We offer a variety of Professional Development workshops. Invite us to come present at your school or at your district pro D day! [Check out the workshops.](#)

Evaluations

We need information for our funders and to improve the program!

Please complete the program evaluation:

<https://tinyurl.com/yd2y56s6>

We rely on this information to secure future funding!