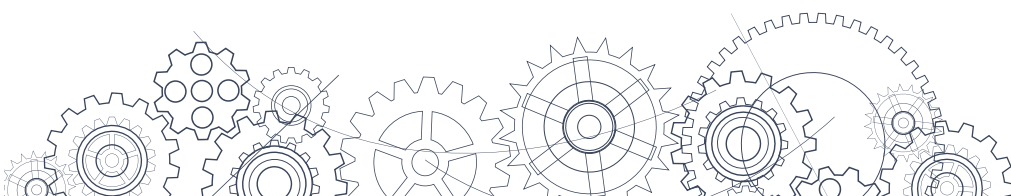


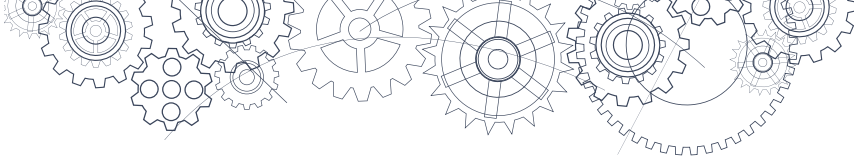
# A Framework for Classroom Assessment



BRITISH  
COLUMBIA

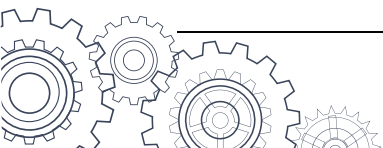
Ministry of  
Education





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# 1. Background and overview

In the fall of 2016, the Ministry of Education mandated a new concept-based, competency-driven curriculum for Grades K-9. As educators began to implement the new curriculum, the ministry received requests for additional instructional and assessment supports. In response, the ministry brought educators together from four areas of learning to create classroom assessment support materials for K-9 Science, English Language Arts, Social Studies, and Mathematics. Samples of their work are contained in this document, and additional resources can be accessed on the [Curriculum website](#).

This work is driven by two shifts in B.C. curriculum and assessment:

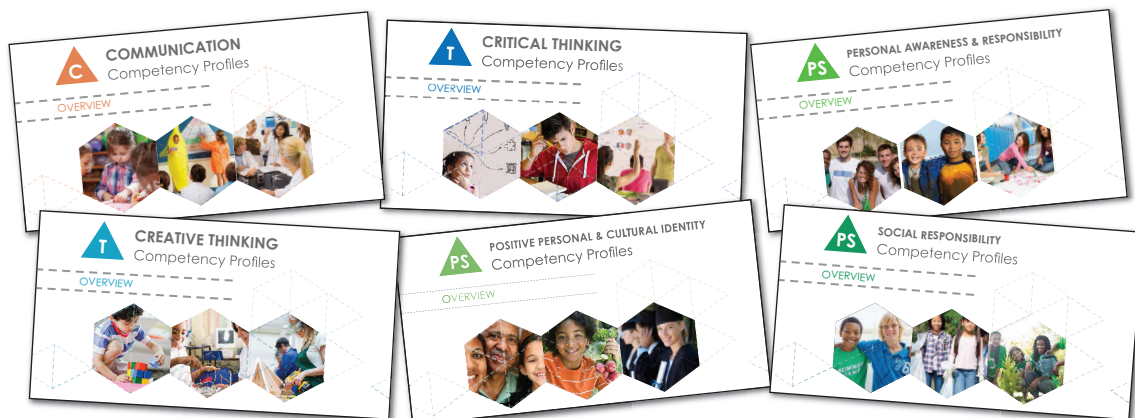
- ➔ **Competency-driven curriculum** – The renewed B.C. curriculum is competency-driven. This emphasis on curricular competencies – the skills, strategies, and processes that students develop within each area of learning – is a new feature. Curriculum, instruction, and assessment are refocused on “doing.”
- ➔ **Focus on classroom assessment** – The focus on classroom assessment is increasing. The Graduation Numeracy and Literacy Assessments are replacing provincial subject-specific examinations in Grades 10-12. Throughout K-12, student progress in relation to the learning standards will be documented mainly by classroom teachers through formative assessment.

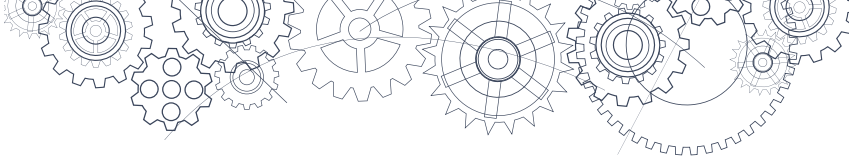
**Areas of learning** (subject areas) are discipline-based fields of knowledge such as Science, English Language Arts, Social Studies, and Mathematics.

**Learning standards** (previously called Learning Outcomes) are explicit statements of what students are expected to be able to do in a given grade or areas of learning (Curricular Competencies) and define what students should know in a given area of learning at a particular grade level (Content).


These shifts support students’ development of curricular competencies and the Core Competencies. Our new focus on the development of competencies (what students can do) is influencing classroom instruction and assessment practices. Increasingly, formative criterion-referenced assessment is creating the basis for responsive communication between students, parents, and teachers on *where students are in their learning* (“Where am I now?”) and *what students need to do to improve* (“Where to next?”).

## The Core Competencies





**Big Ideas:** The Big Ideas consist of generalizations and principles and the key concepts important in an area of learning. They reflect the “Understand” component of the Know-Do-Understand model of learning.



**Area of Learning: SCIENCE**

**Grade 3**

**BIG IDEAS**

Living things are diverse, can be grouped, and interact in their ecosystems.

All matter is made of particles.

Thermal energy can be produced and transferred.

Wind, water, and ice change the shape of the land.

**Learning Standards**

Curricular Competencies	Content
<p><i>Students are expected to be able to do</i></p> <p><b>Questioning and predicting</b></p> <ul style="list-style-type: none"> <li>• Demonstrate curiosity and a sense of wonder</li> <li>• Observe objects and events in familiar contexts</li> <li>• Identify questions about familiar objects and events</li> <li>• Make predictions based on prior knowledge</li> </ul> <p><b>Planning and conducting</b></p> <ul style="list-style-type: none"> <li>• Suggest ways to plan and conduct an investigation</li> <li>• Consider ethical responsibilities when conducting an investigation</li> <li>• Safely use appropriate tools to make observations and measurements and digital technology as appropriate</li> <li>• Make observations about living and non-living things</li> <li>• Collect simple data</li> </ul> <p><b>Processing and analyzing data and information</b></p> <ul style="list-style-type: none"> <li>• Experience and interpret the local environment</li> <li>• Identify First Peoples perspectives and knowledge as sources of information</li> <li>• Sort and classify data and information using drawings or provided tables</li> <li>• Use tables, simple bar graphs, or other formats to represent data and show simple patterns and trends</li> <li>• Compare results with predictions, suggesting possible reasons for findings</li> </ul>	<p><i>Students are expected to know</i></p> <ul style="list-style-type: none"> <li>• biodiversity in the local environment</li> <li>• the knowledge of matter is anything that has mass and takes up space</li> <li>• energy is needed to do work</li> <li>• atoms are building blocks of matter</li> <li>• sources of thermal energy</li> <li>• transfer of thermal energy</li> <li>• major local landforms</li> <li>• local First Peoples</li> <li>• observable changes in the local environment caused by erosion and deposition by wind, water, and ice</li> </ul>

**Curricular Competencies:** The Curricular Competencies are the skills, strategies, and processes that students develop over time. They reflect the “Do” in the Know-Do-Understand model of learning. While Curricular Competencies are more subject-specific, they are connected with the Core Competencies.

**Content:** The Content learning standards – the “Know” of the Know-Do-Understand model of learning – detail the essential topics and knowledge at each grade level.

### A framework based on curricular competencies

The provincial focus on competency development is affecting teaching, learning, and the way teachers approach assessment. *A Framework for Classroom Assessment* presents a conceptual framework for designing classroom assessments focused on the curricular competencies. It describes how, using the framework as a guide, teacher teams collaborated to develop observable criteria for Science, English Language Arts, Social Studies, and Mathematics to support classroom assessment activities.

Figure 1 shows the conceptual framework, which begins with analysis of the curricular competencies:

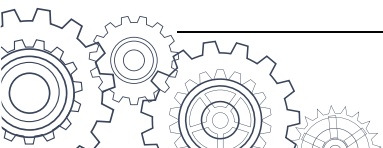
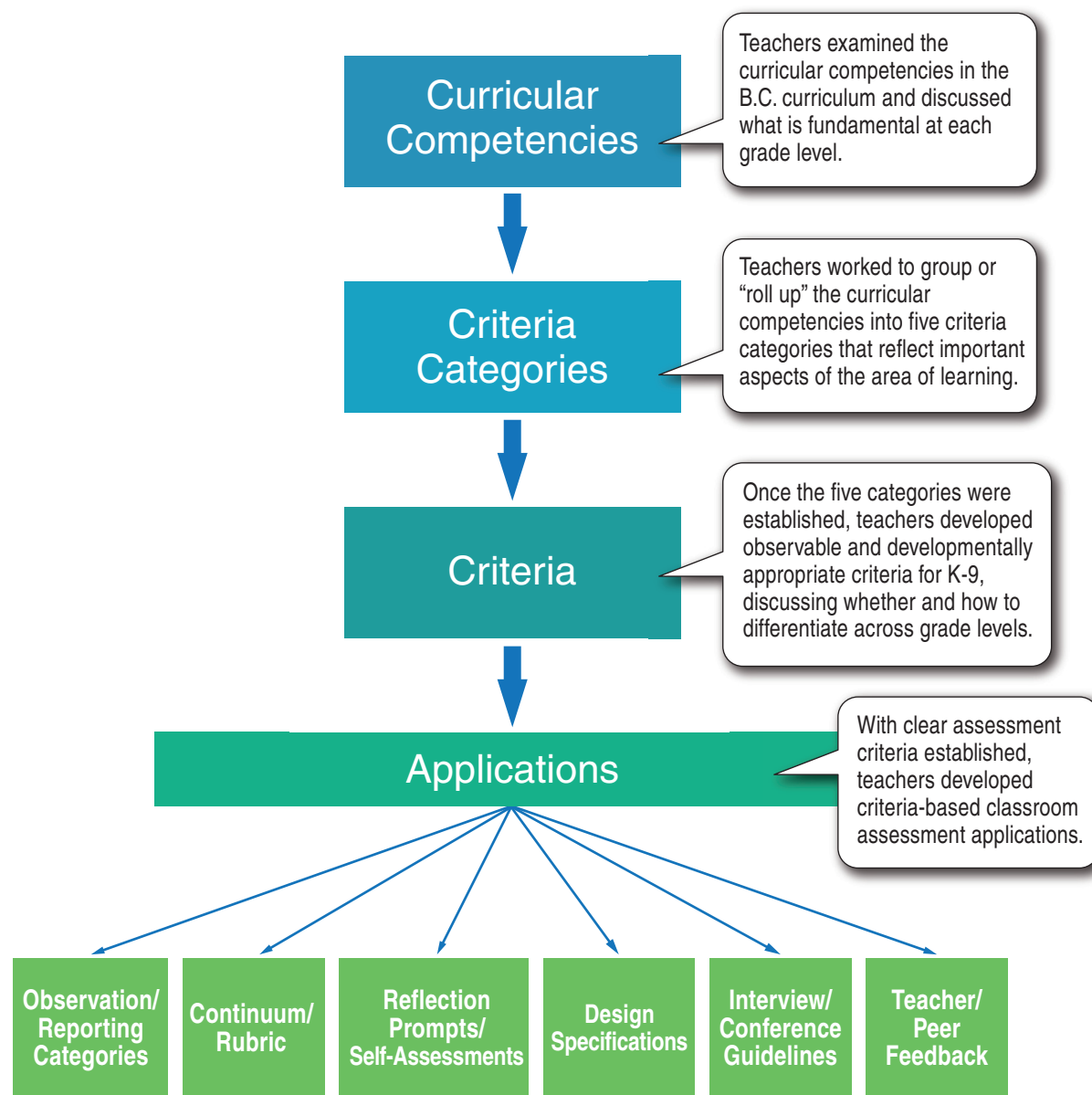


Figure 1: Framework for Classroom Assessments

## Framework for Classroom Assessments



The criteria categories, criteria, and sample applications included in this document and on the [Curriculum website](#) are available for teachers to use when developing their own criteria-based classroom assessment applications to inform their teaching and learning.

**Teacher teams found the collaborative process of analyzing the curricular competencies and exploring and discussing “what is fundamental” to be valuable professional dialogue and learning, strengthening their understanding of the deep structure of the curriculum. The criteria categories and criteria presented later in section 3 are the teacher teams’ interpretations and are provided as optional resources to support student learning and professional learning.**





## 2. Key features of the framework

### ✓ Offers a consistent approach across all grades and areas of learning

Although the assessment criteria are specific to areas of learning, the five-criteria-category structure is consistent across all areas of learning. In many cases, the criteria categories are similar across learning areas, providing opportunities for cross-curricular instruction and assessment.

#### ***Why five criteria categories?***

*Five categories naturally evolved from the Curricular Competencies from the areas of learning that teacher teams worked with. It was agreed that five was a manageable number of categories. The teacher teams also felt that the consistency afforded by having five categories across areas of learning would support instruction and assessment.*

### ✓ Highlights key aspects of student development across grade-level bands

The criteria categories outline the essence of competence (i.e., what the student is able to do) within an area of learning. The criteria within each criteria category provide observable descriptions specific to grade levels. Some categories are taken directly from the curriculum. However, in many cases, development teams have synthesized the curricular competencies into a smaller number of categories.

#### ***Why are the criteria categories different from the existing curricular competency categories/headings?***

*The Curricular Competencies are not criteria. Teacher teams reviewed all Curricular Competency standards to determine key, observable criteria that could be used in a variety of assessment applications.*

The criteria categories and criteria bring an assessment lens to the Know-Do-Understand model, supporting formative assessment and a criterion-referenced approach.

### ✓ Reflects learning standards within grade levels and areas of learning

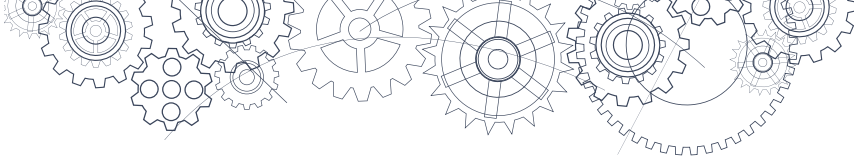
The criteria categories are developed for grade bands, reflecting the reality that general categories and key criteria in most learning areas do not change dramatically from one grade to another. What does change is their application within the Content specified for that grade level.

### ✓ Enables students to demonstrate the same learning in different ways

The essential purpose of assessment is to explore the extent to which students have developed competencies, not the facility with which they perform specific tasks. When the focus is on competence, the assessment question is, “To what extent can students demonstrate this competency?”

In British Columbia, classroom assessment has at times been “task-driven,” with achievement described in terms of the extent to which a student is able to perform a specific task or answer specific questions. When assessment is task-driven, all students perform the same task.

When assessment is competency-driven, the task is the vehicle for demonstrating one or more competencies. Different students may demonstrate the same competency through many different tasks. They are able to choose.



### ✓ Focuses on the “Do” of Know-Do-Understand

The framework for classroom assessment highlights the increased focus on “doing” in the B.C. curriculum. Assessment criteria are created from the curricular competencies rather than the content and/or big ideas. However, the content and big ideas are integral to the process; the curricular competencies require the use of content to build greater understandings. The focus on the “do” from Know-Do-Understand reflects the fundamental intentions of the B.C. curriculum.

### ✓ Supports communication among students, teachers, and parents

This framework is designed to offer a clear and consistent representation of what is most important across areas of learning. Along with the classroom assessment resources in this document, the framework can prompt discussion, inquiry, and collaboration among teachers both within and across learning areas, specializations, and grade levels. The criteria categories and criteria provide a common language and framework for communication with students and parents.

## 3. Criteria categories and criteria

### Curricular competencies

The B.C. curriculum specifies curricular competencies for each area of learning and grade level/grade range:

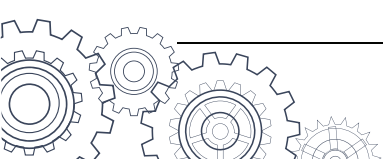
The curricular competencies are the skills, strategies, and processes that students develop over time. They reflect the “do” in the know-do-understand model of learning. While curricular competencies are more subject-specific, they are connected to the core competencies.

– [Curriculum Overview](#)

### Criteria categories

Based on curricular competencies, criteria categories reflect the key competencies within an area of learning and are the same from Kindergarten through Grade 9. They are associated with areas of learning; however, they can also facilitate cross-curricular assessment. Teachers may choose the categories that are relevant to particular tasks or contexts. In some cases, they may focus on one category. In more extensive tasks and inquiries, they may use all of the categories.

**These categories have been developed by teachers for teachers. They are not required and are intended only to support teachers in their assessments.**



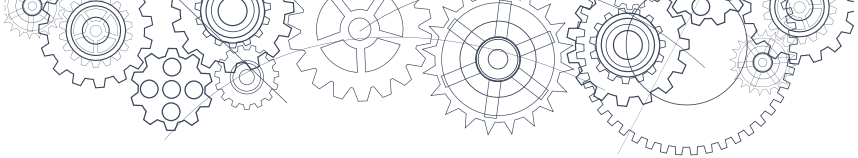


Table 1 shows the criteria categories developed by the teacher teams for Science, English Language Arts, Social Studies, and Mathematics.

**Table 1: Criteria categories for Science, ELA, Social Studies, and Mathematics**

Science	English Language Arts	Social Studies	Mathematics
Questioning	Engaging and Questioning	Inquiry and Questioning	Questioning and Investigating
Procedures and Evidence	Processing	Evidence and Interpretation	Connecting and Reflecting
Analysis	Analyzing	Analysis	Reasoning and Analyzing
Ethics	Recognizing Identity and Voice	Ethics and Decision-making	Understanding and Solving
Communicating	Constructing and Creating	Communication and Justification	Communicating and Representing

## Criteria

Within each category, the assessment criteria reflect specific curricular competencies within the grade-level bands. The criteria:

- ➔ are strength-based
  - focus on what students can do
- ➔ incorporate key aspects of the curricular competencies at that level
  - focus on evidence of learning
- ➔ follow a similar pattern across grades, creating a continuum
  - give teachers a quick look at what comes before/after the grade they are working with
  - offer support in assessing/planning for students who are not yet demonstrating grade-level criteria
- ➔ are relatively broad
  - allow flexibility and tailoring to specific tasks/situations
- ➔ are typically limited in number per category
  - keep focus and emphasis on what's most important
  - may not all be relevant in a specific situation





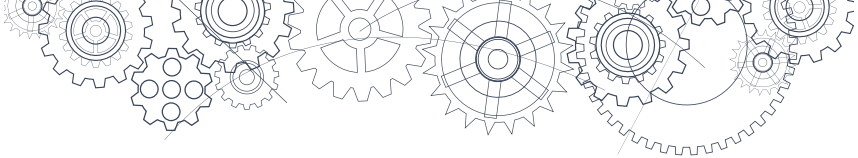
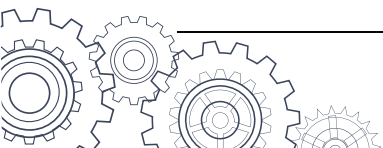
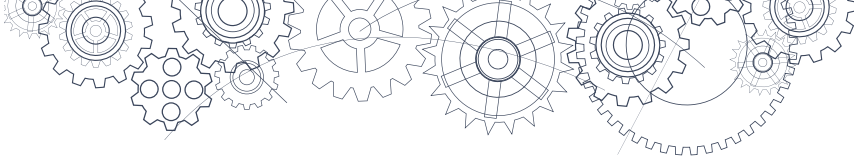


Table 2 shows sample criteria developed by the teacher team for Science.

**Table 2: Sample criteria from Science**

Criteria category	Criteria		
	Science: K	Science: Grades 3-4	Science: Grades 7-8
<b>Questioning</b>	<ul style="list-style-type: none"> <li>• Makes observations about objects and events in familiar contexts</li> <li>• Uses observations and curiosity to form questions</li> </ul>	<ul style="list-style-type: none"> <li>• Makes and records observations about objects and events in familiar contexts</li> <li>• Asks questions about observations that can be investigated</li> <li>• Makes predictions based on prior knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• Makes and records accurate and precise observations</li> <li>• Asks questions about their observations that lead to a scientific inquiry</li> <li>• Makes predictions about their scientific inquiries</li> <li>• Formulates a hypothesis</li> </ul>
<b>Procedures and Evidence</b>	<ul style="list-style-type: none"> <li>• Safely uses materials</li> <li>• Gathers simple data</li> </ul>	<ul style="list-style-type: none"> <li>• Suggests ways to plan and safely conduct an investigation</li> <li>• Collects, sorts, and classifies simple data</li> <li>• Recognizes that data comes from multiple sources</li> </ul>	<ul style="list-style-type: none"> <li>• Chooses appropriate methods and materials to safely conduct their own inquiry</li> <li>• Measures and controls variables</li> <li>• Accurately collects and records data using a variety of tools</li> <li>• Finds and uses data from multiple sources</li> </ul>
<b>Analysis</b>	<ul style="list-style-type: none"> <li>• Represents simple data in a variety of ways</li> <li>• Discusses observations</li> </ul>	<ul style="list-style-type: none"> <li>• Represents patterns and relationships in data using given methods (e.g., table, graph)</li> <li>• Uses data to infer the relationship between predictions and results</li> <li>• Reflects on evidence to determine whether an investigation was a fair test</li> </ul>	<ul style="list-style-type: none"> <li>• Identifies and represents patterns and relationships in data in a variety of ways</li> <li>• Uses data to support conclusions</li> <li>• Identifies possible sources of error and refines investigation methods</li> <li>• Identifies bias and assumptions in primary and secondary sources</li> </ul>
<b>Ethics</b>		<ul style="list-style-type: none"> <li>• Considers ethical responsibilities when designing an investigation</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluates social, ethical, and environmental implications in investigations</li> </ul>
<b>Communicating</b>	<ul style="list-style-type: none"> <li>• Communicates observations and ideas reflecting personal experience of place</li> </ul>	<ul style="list-style-type: none"> <li>• Explains ideas and processes reflecting personal or shared experience of place</li> </ul>	<ul style="list-style-type: none"> <li>• Clearly and concisely communicates scientific ideas and information</li> <li>• Expresses and reflects on place through a variety of methods</li> </ul>





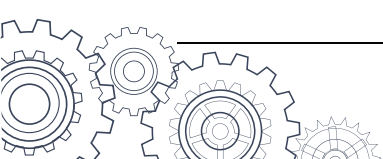
## 4. Applications

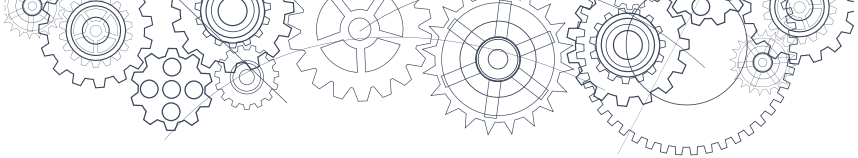
Criteria categories and criteria can be used to develop tasks, create assessment tools, and/or communicate student progress. They support ways to design and facilitate whole-class, group, and individual assessments.

Applications may include the following:

- ➔ **Observation/reporting categories:** Teachers select relevant criteria categories and criteria to guide their observations of students in the context of regular classroom activities or during planned assessment tasks. Teachers document their observations to support formative or summative assessments.
- ➔ **Continuum/rubric:** Teachers and students may create charts or tables identifying specific criteria categories and criteria relevant to an assessment task. Continuums and rubrics often describe the qualities or characteristics of proficiency at various levels (such as emerging, developing, proficient, or extending).
- ➔ **Reflection prompts/self-assessments:** Reflection prompts are questions or statements that encourage students to think about their learning and identify how they have developed over time in relation to criteria. When self-assessing, students reflect, gather evidence, and assess their own progress. This process leads to increased self-awareness, ownership, and engagement.
- ➔ **Design specifications:** Teachers may use criteria categories and/or criteria as a frame for planning assessment tasks (e.g., projects, tests). For example, a design specification for an exam could describe the criteria categories that would be assessed and the number of items that would be placed in each category.
- ➔ **Interview/conference guidelines:** Students, parents, and teachers may wish to use the criteria categories and criteria to discuss individual student progress in areas of learning.
- ➔ **Teacher/peer feedback:** The criteria categories and criteria can be used to guide conversations when providing strength-based teacher or peer feedback to students.

Teachers can invite students to develop and demonstrate their learning in various ways, all connected to the assessment criteria (see the example for Science shown in Table 2). They can also elaborate on the high-level criteria with more specific descriptors, based on particular tasks and learning contexts. The table provides a starting point.





## 5. Sample applications

The following sample applications employ criteria categories and criteria and are designed to support learning through formative and summative assessments. Used well, these tools will inform teaching and learning, providing information for students and/or parents/guardians on progress and goal setting in relation to the learning standards of the new curriculum.

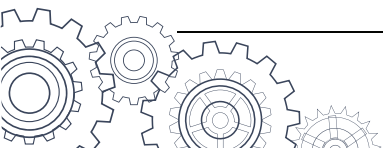
### Sample application for Kindergarten English Language Arts

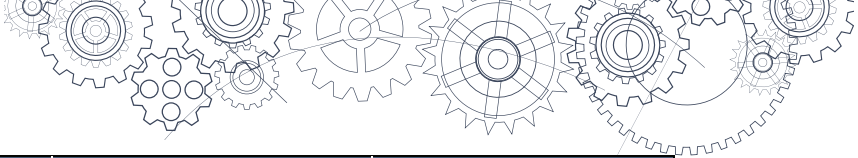
#### Community and Story in Kindergarten English Language Arts

Throughout the term, Kindergarten students focused on understanding community, participating in discussions, and story workshop; learning experiences addressed all five Criteria Categories for Kindergarten ELA. Evidence of student learning was posted in digital portfolios. The sample teacher comments below represent what a teacher might choose to highlight in a communication with parents about an individual student’s learning progress.

**Teacher’s comments:** This term we have focused on key concepts of self and family through discussion, story, and pictorial representation. Nora is engaged during circle time and encourages other students to join her. Since the beginning of the school year, Nora has found her voice and her place among her peers. Below you will find comments about Nora’s learning in English Language Arts focused on Engaging and Questioning, Processing, and Identity and Voice. Additional information about her learning may be seen in her digital portfolio posts on Jan 12, Feb 6, 16, and Mar 8.

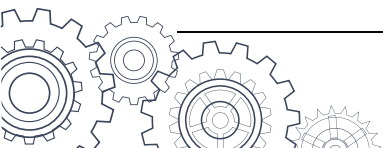
Criteria category	Kindergarten criteria	Descriptive feedback	Goal setting
<b>Engaging and Questioning</b>	<ul style="list-style-type: none"> <li>• Listens and responds</li> <li>• Discovers that story/text has purpose</li> <li>• Makes connections and uses background knowledge to show understanding</li> </ul>	Nora has learned about school structures, like waiting your turn, sharing spaces, and the way we go about learning in our day. She enjoys story time and sharing her life experiences.	In the next term, Nora will be working on asking questions related to the topic.
<b>Processing</b>	<ul style="list-style-type: none"> <li>• Makes meaning from shared story/text</li> <li>• Identifies basic language features and story structure</li> </ul>	Nora listens to stories and can reflect on key ideas. She contributes her ideas to the group and asks thoughtful questions.	Nora is working to recognize beginning, middle and end of story/text.
<b>Analyzing</b>	<ul style="list-style-type: none"> <li>• Makes connections with self</li> <li>• Makes predictions and visualizations about story/text</li> </ul>	Nora is learning to use reading strategies and has a keen ability to identify details within a story.	Nora will continue to make connections with self, text and world to extend her learning.





Criteria category	Kindergarten criteria	Descriptive feedback	Goal setting
<b>Recognizing Identity and Voice</b>	<ul style="list-style-type: none"> <li>• Connects story/text with personal experiences</li> <li>• Recognizes that story/text reflects family and community</li> <li>• Communicates about self and family</li> <li>• Shares ideas, feelings and perspectives</li> <li>• Listens to the ideas of others</li> </ul>	Nora is learning about herself. She is finding her place in the classroom community. Nora often shares stories about her family and her experiences. During a story, she was able to see how the main character was like her grandmother. She was very proud of this connection!	We will continue to nurture the growth of Nora's new-found voice.
<b>Constructing and Creating</b>	<ul style="list-style-type: none"> <li>• Experiments with print to tell a story</li> <li>• Shares ideas, feelings and opinions</li> <li>• Orally shares a story</li> </ul>	Nora enjoys the writing centre immensely. She loves to represent her ideas through pictures and print. She willingly talks about the stories she creates and was most proud of her Halloween night story and how her dog was afraid of the fireworks.	Nora is working toward printing a personal narrative to tell her story.

Proficiency Scale				
	Emerging	Developing	Proficient	Extending
	The student demonstrates an initial understanding of the concepts and competencies relevant to the expected learning.	The student demonstrates a partial understanding of the concepts and competencies relevant to the expected learning.	The student demonstrates a complete understanding of the concepts and competencies relevant to the expected learning.	The student demonstrates a sophisticated understanding of the concepts and competencies relevant to the expected learning.





## Sample application for Grade 4 Social Studies

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### Observation sheet

This resource can be used to record teacher observations of student learning in relation to the learning standards. Curricular competencies have been “rolled up” into five criteria categories. The criteria describe what it means to be “emerging, developing, proficient, and extending” in Grade 4 Social Studies. Please note that there is no “perfect match” or one-to-one correspondence between criteria categories and curricular competencies. Should teachers feel that criteria descriptions belong to different criteria categories, they are free to revise according to their preferences.

**Context:** A Grade 4 teacher designed a unit to address the following components of the curriculum:

- Curricular Competencies:
  - Differentiate between intended and unintended consequences of events, decisions, or developments, and speculate about alternative outcomes (cause and consequence)
  - Construct narratives that capture the attitudes, values, and worldviews commonly held by people at different times or places (perspective)
  - Make ethical judgments about events, decisions, or actions that consider the conditions of a particular time and place (ethical judgment)
- And Content:
  - Early contact, trade, co-operation, and conflict between First Peoples and European peoples

Assessment focused on the following criteria categories:

- Evidence and Interpretation – Perspectives
- Analysis – Cause and Consequence
- Ethics and Decision-making – Ethical Judgment
- Communication and Justification

This unit involved a series of activities, including group work and a presentation on trade contact and the intended and unintended consequences of this interaction. Students learned how these interactions were perceived by the stakeholders (i.e., European explorer and First Nations person), how these interactions may have been judged ethically then by Europeans, and how we, as Canadians, judge these interactions now. In a journal writing activity, students wrote letters about early contact from the perspective of a European explorer of choice and a First Nations representative of choice.

## Observation sheet

Criteria category	Emerging	Developing	Proficient	Extending
<b>Evidence and Interpretation</b>	Can identify that different people say different things, with support	Can identify that people don't always see things the same way, independently	Can identify perspectives and the people associated with them, independently	Can identify multiple perspectives on issues and can speculate multiple reasons why people perceived events differently, independently
	Can identify that people don't always see things the same way, with support	Can identify perspectives and the people associated with them, with support	Can identify multiple perspectives, the people associated with them, independently. Can speculate why different people might experience things differently, with support	
<b>Analysis</b>	Can identify that some actions cause others, with support	Can identify that some actions have expected consequences, with support	Can identify that some actions have expected consequences (indep), and some have unexpected consequences, with support	Can identify that actions have expected and unexpected consequences, and can speculate about different possible outcomes, independently
	Can identify that some actions cause others, independently	Can identify that some actions have expected consequences, independently	Can identify that actions have expected and unexpected consequences (indep), and can speculate about different possible outcomes, with support	
<b>Ethics and Decision-making</b>	Can decide if they think something is right or wrong	Can make an ethical judgment and explain their decision, independently	Can consider the context of actions and make an ethical judgment about actions in the past from the perspective of the time and the current time, with support	Can consider the context of actions and make an ethical judgment using criteria about actions in the past from the perspective of the time and of the current time, independently
	Can decide why they think something is right or wrong, and explain this decision, with support	Can make an ethical judgment about actions in the past from the perspective of our current time, independently	Can consider the context of actions and make an ethical judgment about actions in the past from the perspective of the time and the current time, independently. Can explain the criteria for their judgment, with support	
<b>Communication and Justification</b>	Can communicate ideas with others appropriately, with support	Can communicate ideas appropriately with others, independently	Can choose the most appropriate way of communicating information to others, independently. Can communicate using more than one medium, independently	Can communicate ideas appropriately using a variety of mediums, independently





## Sample application for Grade 6 Mathematics

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### Peer interview

Grade 6 students have collated evidence of their learning in Math into portfolios and will share these with their parents in three-way interviews. Two students interview one another, discussing how their portfolios demonstrate their learning in Mathematics, in preparation for parent-teacher-student interviews later in the week. Prior to the peer interviews, the teacher and students reviewed the criteria categories, brainstormed, and co-created interview questions together.

<b>Criteria category:</b> Questioning and Investigating
<b>Criteria</b> <ul style="list-style-type: none"><li>• Ask questions that demonstrate curiosity and wonder</li><li>• Pose new questions and problems</li></ul>



**Interviewer:** What have you been most excited about learning in Math this year and why? What do you wonder about or want to learn more about?

**Interviewee:** I really liked it when we learned about areas for triangles and other different shapes because I learned about how finding an area of a triangle was like half of a rectangle. Here on this page you can see where I was trying to work out the area for trapezoids and that was really hard at first because you have to think of it as a rectangle and two triangles. But then once I understood that, I thought about how if you know the basics for the areas of shapes, then I could really figure out all kinds of weird shapes. It's kind of like breaking the shape into puzzle pieces. So I want to learn more area formulas cause it's fun.



**Criteria category: Reasoning and Analyzing**

**Criteria**

- Use logical reasoning to make decisions and reasonable estimates
- Demonstrate fluent and flexible thinking about number
- Identify and use patterns and relationships
- Describe, measure, and compare spatial relationships
- Estimate using referents, approximation, and rounding strategies

**Interviewer:** What is one thing you can show me that demonstrates how you used logic to analyze a math problem this term?

**Interviewee:** Well when Ms. B asked us to estimate how many people in our school had brothers or sisters, or pets, or how many were in French Immersion and all that, I had to figure out with my group how we could measure that and find approximate numbers. So we asked everyone in our class those questions and because we have 18 classes in our school we figured out how to multiply our class total by eighteen. And then we had to estimate how many would be too many and how many would be too few and explain our thinking to the class.

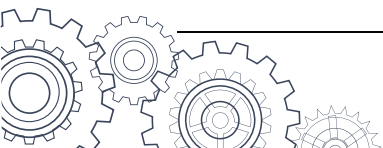
**Criteria category: Understanding and Solving**

**Criteria**

- Use tools or technology to play with, explore, and analyze mathematical ideas
- Apply multiple strategies to solve problems in both abstract and real-life contexts
- Offer different visual solutions
- Model mathematics in real-life contexts

**Interviewer:** Tell me about a time when you had to use math strategies or tools to explore and solve a problem.

**Interviewee:** When we did that bucket activity with all the different bottles full of water. We had to figure out how many litres the bucket was and then figure out how many bottles of water it would take to fill the bucket. But it was kind of hard because all the bottles were different sizes. So my team chose the 500 ml bottle because we know how many millilitres are in a pop bottle and kept filling it up and dumping it in the bucket. We drew a line on the bucket every time so we could see how much was half a litre and how much was a litre and it went all the way up to six litres. Then we could figure out the capacity for other bigger and weird-shaped containers easier.





### Criteria category: Connecting and Reflecting

#### Criteria

- Make connections between First Peoples worldviews and mathematical concepts
- Connect mathematical concepts:
  - with other mathematical concepts
  - with other areas of learning
  - with personal interests
- Reflect on mathematical thinking of self and others
- Use mathematical arguments to support decisions

**Interviewer:** What's one activity or project that connected with your personal interests and why?

**Interviewee:** When we had to figure out the area of our classroom and we even had to take away the spot where the door comes in right there, because it's not a perfect square. That was cool and here is a picture of me in my backyard because I was measuring how long the fence was to figure out the area of the backyard. And after that I wanted to see how much bigger my brother's bedroom was than mine and I found out that it is 20 square metres bigger. So that's not really fair that I get a smaller bedroom.

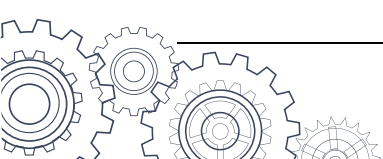
### Criteria category: Communicating and Representing

#### Criteria

- Communicate thinking using mathematical vocabulary
- Explain and justify mathematical ideas and decisions of:
  - self
  - others
- Represent mathematical ideas in concrete, pictorial, and symbolic forms

**Interviewer:** Tell me about when you had to make a decision using math, and how and why you made it.

**Interviewee:** When we had our sweet sale in class and everyone brought stuff to sell and everyone had four (pretend) dollars to spend. We had to decide what to buy. I really wanted a Nanaimo bar and they were \$1.75 and then I had \$2.25 left. The small Rice Krispies were only 50 cents but the big ones were \$1.00 but I decided to get the bigger one because it was way bigger than two of the little ones put together. Then I had \$1.25 left so I bought a chocolate chip cookie and I only had 25 cents left and didn't have enough money to buy anything else. I should have figured out what to buy ahead of time because I wasted 25 cents.



## Sample application for Grade 9 Science

### Table of specifications for case study test

The table below provides an example of how a teacher may intentionally develop an end of unit test that ensures the questions are criterion referenced and appropriately balanced to obtain a fair representation of the learning throughout the unit.

This case study includes background information, purpose for research, and raw data. No data analysis or conclusions are provided. Bias is not explicit.

Criteria category	Case Study Assessment	Grade 9
<b>Questioning</b>	<ul style="list-style-type: none"> <li>• 2–3 questions based on:               <ul style="list-style-type: none"> <li>○ Context</li> <li>○ Predicting</li> <li>○ Formulating hypotheses</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Makes and records qualitative and quantitative observations</li> <li>• Asks a testable question answered through scientific inquiry</li> <li>• Makes multiple predictions for an outcome</li> <li>• Formulates multiple hypotheses</li> </ul>
<b>Procedures and Evidence</b>	<ul style="list-style-type: none"> <li>• 4–6 questions based on:               <ul style="list-style-type: none"> <li>○ Safe procedures</li> <li>○ Variables</li> <li>○ Data collection methods</li> <li>○ Reliability of data</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Plans and uses a variety of investigation materials and methods to safely collect reliable data</li> <li>• Performs experiments using dependent and independent variables</li> <li>• Accurately collects and records data using a variety of tools</li> <li>• Finds and uses data from reliable sources</li> </ul>
<b>Analysis</b>	<ul style="list-style-type: none"> <li>• 6–8 questions based on:               <ul style="list-style-type: none"> <li>○ Creating a graph</li> <li>○ Patterns in data</li> <li>○ Sources and impact of errors</li> <li>○ Possible bias in data</li> <li>○ Validity of data</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Seeks, analyzes, and represents patterns and relationships between variables</li> <li>• Draws conclusions consistent with data</li> <li>• Evaluates experimental methodology, including sources of error and its impact on their data</li> <li>• Identifies bias and evaluates validity of data in primary and secondary sources</li> </ul>
<b>Ethics</b>	<ul style="list-style-type: none"> <li>• 2–3 questions based on:               <ul style="list-style-type: none"> <li>○ Environmental impacts and concerns</li> <li>○ Social impacts and concerns</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Evaluates social, ethical, and environmental implications in investigations</li> </ul>
<b>Communicating</b>	<ul style="list-style-type: none"> <li>• Holistic assessment of entire response based on:               <ul style="list-style-type: none"> <li>○ Clarity of ideas</li> <li>○ Scientific accuracy</li> <li>○ Logical conclusions</li> <li>○ Connection to place</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Creates a model to describe a phenomenon</li> <li>• Clearly and concisely communicates scientific ideas and information</li> <li>• Expresses and reflects on place through a variety of methods</li> </ul>

**Feedback on these classroom assessment resources will help inform the development of similar assessment supports for other areas of learning in K-9. Questions and comments are welcome at [studentprogress@gov.bc.ca](mailto:studentprogress@gov.bc.ca).**