

# Numeracy Performance Standards Revision

## Instructions for Field-Testing

### Context

Over the past year, the Ministry has been working with math educators to update the BC Numeracy Performance Standards to ensure that they are aligned with the current curriculum, while continuing to build on the extensive work that many BC districts, schools, teachers, and inquiry groups have already done.

The revised standards will feature:

- One scale for each of grades 1-3; 4-6; 7-9; 10-12, with space to indicate the specific **strands** and **key concepts** that are being assessed in specific cases.
- Tasks/sample sets at each grade (we plan to have a minimum of two tasks/student sample sets – and at least one of these will feature **number**)

In the first phase of the revision, prototypes for Grades 1 to 9 have been field-tested. These prototypes mainly feature number. Currently, we have developed more tasks featuring other strands and they need to be field-tested.

### Field-testing Procedures

Tasks for Grades 1 to 9 have been developed for field-testing. This task package includes a task description and the quick scale.

- We need you and your students to try the task and send the students' work to the Ministry.
- We need you to evaluate the task and use the quick scale to score students' work.
- Provide specific, concrete feedback. Use the attached *Feedback Questions* to provide focused feedback.
- Send your comments and students' work from your field testing to the Ministry. We'd like to hear from you by **December 23, 2011**.
- If you have developed any 'student-friendly' materials/tasks, please send them along.
- These tasks are being circulated as widely as possible, so please feel free to share them with others.

If you want to discuss the field testing process, please contact Nancy Walt at [Nancy.Walt@gov.bc.ca](mailto:Nancy.Walt@gov.bc.ca) or Jiemei Li at [Jiemei.Li@gov.bc.ca](mailto:Jiemei.Li@gov.bc.ca)

Please send your comments, student samples and any new materials or tasks by **December 23, 2011** to Jiemei Li

- by email at [Jiemei.Li@gov.bc.ca](mailto:Jiemei.Li@gov.bc.ca)
- by mail at: Curriculum and Assessment, PO Box 9183 Stn Prov Govt  
Victoria, BC V8W 9H1

or post them on the Moodle at <http://www.learnnowbc.ca/educators/default.aspx>

## Numeracy Performance Standards Revision

### Feedback Questions

1. What suggestions do you have about the use of the numeracy performance standards? Are these materials easy for teachers to use?
2. Is the task grade/age-appropriate? Provide your comments and suggestions for improvement.
3. Are the rating scales easy to apply to student work? What improvements are needed?
4. Do you have student samples to demonstrate the various performance levels? Please send all or a selection of your students' work to the Ministry.
5. Have you developed any 'student-friendly' materials or tasks? Please send them to the Ministry.

Please send your comments and student samples by **December 23, 2011** to Jiemei Li

- by email at [Jiemei.Li@gov.bc.ca](mailto:Jiemei.Li@gov.bc.ca)
- by mail at: Curriculum and Assessment, PO Box 9183 Stn Prov Govt  
Victoria, BC V8W 9H1

or post them on the Moodle at <http://www.learnnowbc.ca/educators/default.aspx>

Thank you!

**Quick Scale: Numeracy Performance Standards (Grades 4-6)**

**Task:** \_\_\_\_\_

**Grade** \_\_\_\_\_

|        |  |
|--------|--|
| Strand | Key concepts required by this task (see IRP p. 16) |
|        |  |
|        |  |
|        |  |

|  | <b>Not Yet Within Expectations</b>   | <b>Meets Minimal Expectations</b>   | <b>Fully Meets Expectations</b>  | <b>Exceeds Expectations</b>  |
|--|--|---|--|--|
| <b>Snapshot</b>  | <i>Does not meet basic requirements of the task(s) without close, ongoing assistance. Usually unable to explain result.</i>  | <ul style="list-style-type: none"> <li>Satisfies basic requirements for most parts of the task, but some important aspect is flawed or incomplete. Partial explanation.</li> </ul>  | <ul style="list-style-type: none"> <li>Satisfies basic requirements for all parts of the task(s); reaches and explains reasonable solution(s). (may be minor flaws)</li> </ul>   | <ul style="list-style-type: none"> <li>Thoroughly satisfies requirements of all parts of the task; solution is well-developed and justified; often insightful or innovative..</li> </ul>   |
| <b>Concepts and Connections</b><br>- recognizes the math; applies appropriate concepts [R] [V] [CN]<br>- explains/demonstrates relevant concepts; makes connections [R]  | <ul style="list-style-type: none"> <li>Does not recognize or apply basic concepts needed for the task(s)</li> <li>Shows little understanding of relevant concepts; explanations are incomplete or illogical</li> </ul>   | <ul style="list-style-type: none"> <li>Recognizes/applies concepts needed for most parts of the task(s) (may not be best choice)</li> <li>Shows partial understanding of relevant concepts; explanations may be vague; partially incomplete</li> </ul>  | <ul style="list-style-type: none"> <li>Recognizes/applies concepts needed for all parts of the task(s)</li> <li>Shows understanding of relevant concepts; explanations are logical and complete</li> </ul>   | <ul style="list-style-type: none"> <li>Recognizes/applies a wide range of concepts including those that have not been recently taught; may offer alternatives</li> <li>Shows thorough understanding; explanations are insightful;</li> </ul>   |
| <b>Problem-solving and reasoning</b><br>-selects and uses appropriate strategies to analyze, solve and create problems [PS] [V] [T]<br>- flexible; perseveres<br>- uses estimation strategies [ME]<br>- verifies and justifies that results are reasonable [R] | <ul style="list-style-type: none"> <li>Does not use appropriate strategies; requires extensive support</li> <li>No flexibility; does not persevere to a solution</li> <li>Does not verify or justify</li> <li>Unable to use estimation strategies (answers are often highly improbable)</li> </ul> | <ul style="list-style-type: none"> <li>Uses some appropriate strategies if problem appears familiar; may need some help</li> <li>Limited flexibility and perseverance</li> <li>Needs help to verify or justify; inconsistent</li> <li>Some evidence of estimation; (some answers reasonable)</li> </ul> | <ul style="list-style-type: none"> <li>Uses appropriate strategies</li> <li>Shows some flexibility; in most cases, perseveres to find a solution</li> <li>With prompting, verifies and justifies</li> <li>Uses estimation strategies appropriately; most answers are reasonable</li> </ul> | <ul style="list-style-type: none"> <li>Uses appropriate strategies; often innovative; may add some complexity</li> <li>Shows flexibility; perseverance to find a solution</li> <li>Verifies; justifies</li> <li>Uses effective estimation strategies; answers are reasonable (relatively precise)</li> </ul> |
| <b>Procedures</b><br>- accurate and precise in recording, substitutions, calculations, units, and symbols [C]<br>- fluent; efficient in applying procedures including mental math [ME]   | <ul style="list-style-type: none"> <li>Follows procedures with limited accuracy; major errors or omissions</li> <li>Inefficient; struggles (e.g., false starts; repeats; little evidence of mental math strategies)</li> </ul>   | <ul style="list-style-type: none"> <li>Follows procedures with partial accuracy; some errors or omissions</li> <li>Inconsistent; may be fluent with some procedures but inefficient or not demonstrated in others</li> </ul>  | <ul style="list-style-type: none"> <li>Follows procedures accurately with some minor errors or omissions</li> <li>Uses most procedures and mental math strategies fluently; may be inefficient</li> </ul>  | <ul style="list-style-type: none"> <li>Follows procedures with accuracy and precision; very few if any minor errors/omissions</li> <li>Uses procedures and mental math strategies fluently and efficiently; may find own 'shortcuts'</li> </ul>  |
| <b>Representation and Communication</b><br>-communicates mathematically including mathematical language [C]<br>-includes appropriate graphics; representations (e.g., charts, tables, graphs, diagrams; sketches) [V]  | <ul style="list-style-type: none"> <li>Does not explain procedures and results clearly</li> <li>Omits required graphics or representations and/or does not construct them appropriately; many omissions; serious flaws</li> </ul>  | <ul style="list-style-type: none"> <li>Partially explains procedures; results; parts are confusing, vague, incomplete</li> <li>Constructs most required graphics; representations; parts are seriously flawed/incomplete (e.g., scale inappropriate)</li> </ul>   | <ul style="list-style-type: none"> <li>Explains results and procedures clearly using some math language</li> <li>Constructs required graphics and/or representations appropriately; may have minor errors or flaws (e.g., missing labels)</li> </ul>                                       | <ul style="list-style-type: none"> <li>Explains procedures and results precisely; uses mathematical language</li> <li>Constructs required graphics and/or representations effectively and accurately</li> </ul>  |

Used for major tasks, projects, or ongoing observations.

## Numeracy Performance Standards – Grade 6 Task

### The New “C” in Canucks

#### Context

This task requires the student to draw a template of a rectangular vase that follows specific criteria i.e. creating and labelling 6 different types of triangles and recording their angle measurements. Some students may have the ability to understand and create triangles within another larger triangle resulting in understanding the sum of the interior angles being  $180^\circ$ . This task can be offered at the after the students learning about the different types of triangles and how to measure angles.

#### Prescribed Learning Outcome:

##### Grade 6

- C1 demonstrate an understanding of angles by
- classifying angles according to their measure
  - determining angle measures in degrees

- C4 construct and compare triangles, including

- scalene
- isosceles
- equilateral
- right
- obtuse
- acute

in different orientations [C, PS, R, V]

#### Process

Every student should be able to show their understanding of mathematical skills and concepts, and be allowed to represent their understanding through concrete materials, pictures, numbers or words. Providing the opportunities for students to show what they know in a way that makes sense to them is a critical component of assessment.

Assessing student thinking requires posing questions that prompt and extend their thinking. Students may struggle to solve the problem.

The teacher's role is to ask questions that prompt and extend the student's thinking by:

- providing support and guidance
- helping students build on prior knowledge
- scaffolding the student's thinking

## Before

### MATERIALS:

- Triangles BLM
- Protractor
- Different coloured markers

Present the BLM, Triangles. and ask students to identify the following triangles: scalene, equilateral, isosceles, obtuse, acute, and right. Ask students to outline the triangles as they are identified in the “designs”.

Have students explain how they distinguished the various triangles.

Ask students to measure and record some of the angles at the different orientations.

## During

- Present the problem to the students, displaying the instructions for the whole class to see.
- Then provide copies of the page with the letter “C” for each student
- Clarify the problem with the students. Make sure that they are clear on the expectations.
- If some students are experiencing difficulties, you might ask the students to just provide the various triangles on their own i.e., without being in the rectangle.
- Ask the students to record their solutions. Remind them that they may use pictures, numbers or words to show their thinking. **If necessary**, conference with the student and scribe what the student says.
- Refer to the ‘Performance Standards’ to guide your inquiries.

You may need to ask the students prompting questions/statements to help uncover their strategies and thinking processes:

1. How do you know?
2. How did you start solving this problem?
3. Tell me what you are thinking.
4. Show me what you know.
5. What do you see in your head?
6. What questions did you ask yourself?
7. Why do you think that?
8. Could there be a different answer?
9. What strategies did you use to ... ?
10. How does your strategy make sense to you?
11. What tools help you?

## After

**Conduct a 'SHOW AND SHARE' session, encouraging students to share their strategies/thinking and to explain their reasoning to complete the task.**

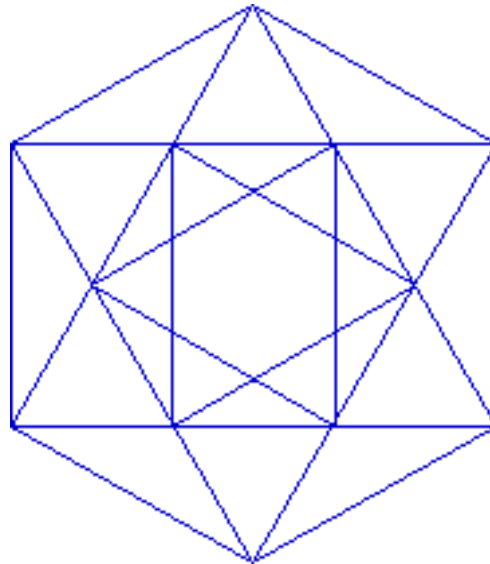
- Ask students to share how they started to draw their triangles.
- Ask students how their strategy of drawing the various types of triangles are similar or different than those shared in the class.
- Refer to the 'Performance Standards' to guide your inquiries.

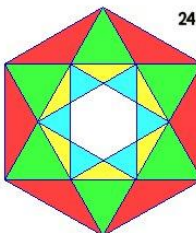
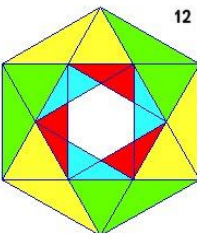
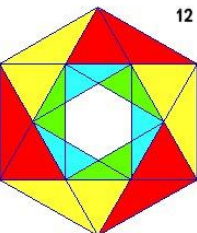
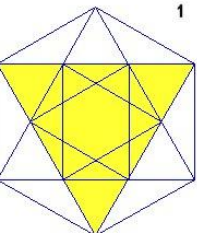
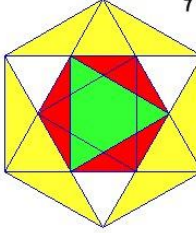
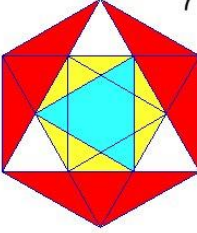
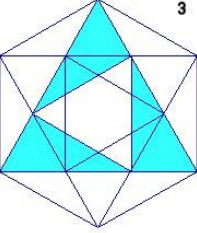
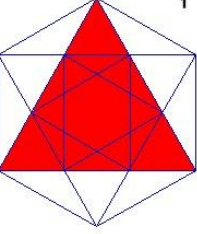
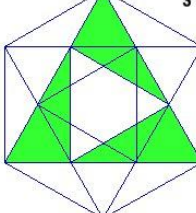
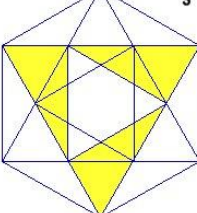
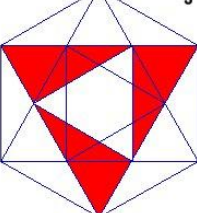
Consider the following questions before recording information:

1. How well did the student understand the question?
2. What strategies did the student use to solve the problem?
3. How much support did the student require?
4. How did the student represent and communicate their thinking?
5. How well did the students reason or justify the solution?
6. In what way/s did the student make connections to other mathematical concepts or real life situations?



# BLM (Triangles)



|   |    |   |    |   |    |  |   |
|---|----|---|----|---|----|--|---|
|  | 24 |  | 12 |  | 12 |                      | 1 |
|  | 7  |  | 7  |  | 3  |                      | 1 |
|  | 3  |  | 3  |  | 3  | <p><b>76</b><br/>Triangles</p> <p><a href="http://puzzleblog.nottong.com">puzzleblog.nottong.com</a></p> |   |

Name \_\_\_\_\_

Date

\_\_\_\_\_

### A New Canucks Logo

The Vancouver Canucks are looking for a new logo. The letter “C” needs a new design.

Use the template and the following criteria to draw the design.

Criteria:

- at least 6 triangles inside the “C”
- at least one of each of the following types of triangles (**colour/pattern**);

|  |  |
|--|--|
| <input type="radio"/> scalene ( <b>blue</b> )      | <input type="radio"/> right ( <b>waves</b> )           |
| <input type="radio"/> equilateral ( <b>green</b> ) | <input type="radio"/> obtuse ( <b>vertical lines</b> ) |
| <input type="radio"/> isosceles ( <b>white</b> )   | <input type="radio"/> acute ( <b>dots</b> )            |

- colour or draw the pattern to match the table (e.g., colour your scalene triangle blue)
- give the angle measurements for three different types of triangles
- include markers showing whether the sides are congruent or not

