

# 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>

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### 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  
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Thank you!

## Quick Scale: Numeracy Performance Standards (Grades 7-9)

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

GRADE \_\_\_\_\_

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

	Not Yet Within Expectations	Meets Minimal Expectations	Fully Meets Expectations	Exceeds Expectations
<b>Snapshot</b>	<ul style="list-style-type: none"> <li>Does not meet basic requirements of the task without close, ongoing assistance. No adequate explanation.</li> </ul>	<ul style="list-style-type: none"> <li>Satisfies basic requirements for most parts of the task; 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; reaches a reasonable solution. (may be minor flaws.)</li> </ul>	<ul style="list-style-type: none"> <li>Thoroughly satisfies requirements of the task; solution is well-developed and justified; shows insight; often innovative.</li> </ul>
<b>Concepts and Connections</b> - recognizes the math; applies appropriate concepts [R] [V] [CN] - explains/demonstrates relevant concepts; makes connections [R]	<ul style="list-style-type: none"> <li>Does not identify or apply concepts and procedures needed</li> <li>Does not show understanding of relevant concepts; explanations are incomplete or illogical</li> </ul>	<ul style="list-style-type: none"> <li>Identifies/applies concepts/procedures needed for most parts of task (may not be best choice)</li> <li>Shows partial understanding of relevant concepts; explanations may be incomplete</li> </ul>	<ul style="list-style-type: none"> <li>Identifies/applies concepts and procedures needed for all parts of task</li> <li>Shows understanding of relevant concepts; explanations are logical and complete</li> </ul>	<ul style="list-style-type: none"> <li>Identifies/ applies a wide range of concepts and procedures including those that have not been recently taught</li> <li>Shows thorough understanding; explanations are insightful</li> </ul>
<b>Problem-solving and reasoning</b> -selects and uses appropriate strategies to analyze, solve and create problems [PS] [V] [T] - uses estimation strategies [ME] - verifies and justifies that results are reasonable [R]	<ul style="list-style-type: none"> <li>Does not use appropriate strategies to analyze and solve problems</li> <li>No evidence of estimation strategies (answers are often highly improbable)</li> <li>Does not verify results or solutions</li> </ul>	<ul style="list-style-type: none"> <li>Uses some appropriate strategies to analyze and solve problems</li> <li>Some evidence of estimation; may be somewhat ineffective (some answers reasonable)</li> <li>May verify parts of results/solution; often needs direction</li> </ul>	<ul style="list-style-type: none"> <li>Uses appropriate strategies to analyze and solve problems</li> <li>Uses estimation strategies appropriately; most answers are reasonable</li> <li>Verifies and justifies results or solutions (may be inefficient; imprecise)</li> </ul>	<ul style="list-style-type: none"> <li>Uses highly effective, often innovative, strategies to analyze and solve problems</li> <li>Uses estimation strategies effectively; answers are reasonable (high precision)</li> <li>Verifies and justifies results or solutions efficiently; precise</li> </ul>
<b>Procedures</b> - accurate and precise in recording, substitutions, calculations, units, and symbols [C] - fluent; efficient in applying procedures including mental math [ME]	<ul style="list-style-type: none"> <li>Limited accuracy in applying procedures.</li> <li>Inefficient; struggles (e.g., false starts; repeats; little evidence of mental math strategies)</li> </ul>	<ul style="list-style-type: none"> <li>Partially accurate; some errors</li> <li>Inconsistent; fluent with some procedures but inefficient or not demonstrated in others</li> </ul>	<ul style="list-style-type: none"> <li>Generally accurate with some minor errors or omissions</li> <li>Follows most procedures appropriately; uses mental math strategies</li> </ul>	<ul style="list-style-type: none"> <li>Accurate and precise; very few if any minor errors/ omissions</li> <li>Uses range of procedures and mental math strategies fluently and efficiently; may find own 'shortcuts'</li> </ul>
<b>Representation and Communication</b> -communicates mathematically including mathematical language [C] -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; key information missing</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; some features are seriously flawed/ incomplete (e.g., not to approximate scale)</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 or dimensions)</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 8 Task

## Go Team Go!

### Context

This task involves the creation of a tessellating design made from squares, parallelograms, triangles or hexagons. Students are asked to manipulate one of these polygons to create a tessellating shape. The design must include three colours in a particular ratio. The final tessellation must fit into a parallelogram of particular dimensions.

### Prescribed Learning Outcome:

#### Grade 8

A4 – demonstrate an understanding of ratio and rate [C, CN, V]

C6 – demonstrate an understanding of tessellation by

- explaining the properties of shapes that make tessellating possible
- creating tessellations [C, CN, PS, T, V]

### Process

#### Before

Pose this problem at the end of a unit on tessellations.

Make pattern blocks, grid paper, pencil crayons, tape, glue and scissors available to students so they can model – and then create - their relations.

To situate the learning, share examples of interesting tessellating patterns. Consider having students bring in hockey or sports team related flags or logos to use as inspiration.

#### During

Provide pattern blocks to students and allow them time to experiment with tessellating patterns while they consider how they will complete the task. Have students talk together about their ideas in small groups or partners.

Ask questions about students' strategies. (*Why did you choose that original shape? What parts of your shape will change? How do you know it will tessellate once it has been altered?*)

Encourage students to record notes on their thinking in draft form as they experiment with their shapes. They will use these notes later to write their descriptions of their methods and the issues that cropped up and were resolved. Remind them that their finished banner must be completed in a ratio of 3:2:1 in terms of colour.

**After**

Have students ensure their work is complete, including the dimensions of their tessellating unit and the number of repeats that will be possible within the larger banner. Have students read their explanation of their design – how they made it, why it tessellates, what transformations were performed on it – to a partner. The partner should ask clarifying questions while the other student reads, prompting the first student to add detail and explanation to their work.

Name \_\_\_\_\_

## Go Team Go!

The math department at your school is having a contest. They have 2 tickets to the hockey game that they are going to award as a prize.



Your job is to design a banner to display at the game.

The best banner wins!

Here are the rules:

- You can start with a square, a parallelogram, a triangle or a hexagon – or a combination of any of these.
- You must change the original polygon in at least 2 ways, keeping it a tessellating shape.
- Your design must be green, blue and white. The colours must be in a ratio of 3 blue to 2 green to 1 white (3:2:1)
- You must include a drawing of your single tessellating unit, as well as its dimensions.
- You must give an explanation of your design that would satisfy a math teacher. Include details about angle measurements, the rotations, flips or slides used, etc.

Be as creative as you can!

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Here is the banner you will be filling.

Height = 100 cm



Base = 150 cm

How many repeats of your basic pattern will fit within the finished banner?

How do you know? Include your calculations.