

Measurement Systems and Similar Triangles

Strand

Measurement
and Trigonometry

Student Text Pages

2–3

Suggested Timing

10–15 min

Related Resources

BLM 1.CO.1 Literacy Link: Word Wall
BLM A4 Presentation Checklist

Key Terms

corresponding angles
corresponding sides
imperial system
metric system
proportional
ratio
similar triangles

Chapter Curriculum Specific Expectations Solving Problems Involving Similar Triangles

In this chapter, students will

MT1.01 verify, through investigation (e.g., using dynamic geometry software, concrete materials), properties of similar triangles (e.g., given similar triangles, verify the equality of corresponding angles and the proportionality of corresponding sides)

MT1.02 determine the lengths of sides of similar triangles, using proportional reasoning

MT1.03 solve problems involving similar triangles in realistic situations (e.g., shadows, reflections, scale models, surveying)

Solving Problems Involving Surface Area and Volume, Using the Imperial and Metric Systems of Measurement

In this chapter, students will

MT3.01 use the imperial system when solving measurement problems (e.g., problems involving dimensions of lumber, areas of carpets, and volumes of soil or concrete)

MT3.02 perform everyday conversions between the imperial system and the metric system (e.g., millilitres to cups, centimetres to inches) and within these systems (e.g., cubic metres to cubic centimetres, square feet to square yards), as necessary to solve problems involving measurement

Additional information and teaching materials for this chapter are available on the McGraw-Hill Ryerson web site at <http://mcgrawhill.ca/books/foundations10>. You will need your password to access this material.

Teaching Suggestions

Chapter Opener

- Ask students, “How would you measure the height of a mountain or the distance across a river?” Discuss local objects that cannot be measured by conventional methods, and have students brainstorm on how they think professionals find these measures.
- Tell students that in Section 1.4, they will investigate how to measure the height of the school’s flagpole. Explain that during this chapter, they will not only learn *how* to find this measure but will have the opportunity to actually *do* it.

Literacy Link

Have students start a word wall. You may wish to have students use **BLM 1.CO.1 Literacy Link: Word Wall** for this activity. Update the word wall and distribute a new copy of **BLM 1.CO.1 Literacy Link: Word Wall** at the start of each new section. You may wish to have students review the Key Terms of the previous sections at the start of each new section, or review all the Key Terms on the word wall in the Chapter Review. For more information on the Think Literacy program, visit <http://www.edu.gov.on.ca/eng/studentssuccess/thinkliteracy>.

Career Profile

- Have students discuss their understanding of a drafting career. As an extension to the discussion, have students research this career and other similar careers, and present their findings to the class. You may wish to use **BLM A4 Presentation Checklist** to assess students’ presentations. Then, using their research, have students discuss:
 - what a draftsperson does
 - what type of education and training are needed for this career
 - what other careers are similar
 - what are the differences in the training and education required for the various similar careers
- Have students include their research in their Portfolios.

Chapter 1 Planning Chart

Section Suggested Timing	Student Text Page(s)	Teacher's Resource Blackline Masters	Assessment	Tools
Chapter 1 Opener • 10–15 min	2–3	• BLM 1.CO.1 Literacy Link: Word Wall	• BLM A11 Presentation Checklist	
Get Ready! • 80–160 min	4–5	• BLM 1.GR.1 Practice: Get Ready	• BLM 1.GR.2 Get Ready Self- Assessment Checklist	
1.1 Imperial Measure • 80 min	6–11	• BLM 1.1.1 Practice: Imperial Measure • BLM 1.1.2 Investigate: The Relationships Among Imperial Units	• BLM A3 Communication General Scoring Rubric	<ul style="list-style-type: none"> calculators gallon containers imperial measuring cups imperial measuring spoons pint containers quart containers sand or water yardsticks
1.2 Conversions Between Metric and Imperial Systems • 80 min	12–18	<ul style="list-style-type: none"> BLM 1.2.1 Practice: Conversions Between Metric and Imperial Systems BLM 1.2.2 Metric–Imperial Conversions 	<ul style="list-style-type: none"> BLM 1.2.3 Achievement Check Rubric BLM A10 Group Work Recording Sheet BLM A8 News Report Checklist 	<ul style="list-style-type: none"> calculators graduated cylinders or measuring cups with both fluid ounces and millilitres metre sticks scales with both pounds and kilograms thermometers with both Celsius and Fahrenheit
1.3 Similar Triangles • 80–160 min	19–29	<ul style="list-style-type: none"> BLM 1.3.1 Practice: Similar Triangles BLM G1 Grid Paper BLM G2 Protractor BLM T1 <i>The Geometer's Sketchpad</i>® 4 	• BLM 1.3.2 Achievement Check Rubric	<ul style="list-style-type: none"> computers grid paper protractors rulers <i>The Geometer's Sketchpad</i>® cardboard coloured pencils or markers plain white paper scissors
1.4 Solve Problems Using Similar Triangles • 160 min	30–37	<ul style="list-style-type: none"> BLM 1.4.1 Practice: Solve Problems Using Similar Triangles BLM 1.4.2 Investigate: Find the Height of Your School's Flagpole BLM T1 <i>The Geometer's Sketchpad</i>® 4 	• BLM A6 Group Work General Scoring Rubric	<ul style="list-style-type: none"> computers Internet access long measuring tapes metre or yardsticks <i>The Geometer's Sketchpad</i>®
Chapter 1 Review • 80 min	38–39	<ul style="list-style-type: none"> BLM 1.CR.1 Chapter 1 Review BLM G.1 Grid Paper 		
Chapter 1 Practice Test • 80 min	40–41	<ul style="list-style-type: none"> BLM G1 Grid Paper BLM T1 <i>The Geometer's Sketchpad</i>® 4 	<ul style="list-style-type: none"> BLM 1.PT.1 Chapter 1 Practice Test BLM 1.CT.1 Chapter 1 Test 	<ul style="list-style-type: none"> computers <i>The Geometer's Sketchpad</i>® grid paper
Chapter 1 Problem Wrap-Up • 30 min	41		• BLM 1.CP.1 Chapter 1 Problem Wrap-Up Rubric	• calculators

Chapter 1 Blackline Masters Checklist

	Title		Purpose
Chapter 1 Opener			
	BLM 1.CO.1	Literacy Link: Word Wall	Literacy
	BLM A11	Presentation Checklist	Assessment
Get Ready!			
	BLM 1.GR.1	Practice: Get Ready	Practice
	BLM 1.GR.2	Get Ready Self-Assessment Checklist	Student Self-Assessment
1.1 Imperial Measure			
	BLM 1.1.1	Practice: Imperial Measure	Practice
	BLM 1.1.2	Investigate: The Relationships Among Imperial Units	Student Support
	BLM A3	Communication General Scoring Rubric	Assessment
1.2 Conversions Between Metric and Imperial Systems			
	BLM 1.2.1	Practice: Conversions Between Metric and Imperial Systems	Practice
	BLM 1.2.2	Metric–Imperial Conversions	Student Support
	BLM 1.2.3	Achievement Check Rubric	Assessment
	BLM A10	Group Work Recording Sheet	Assessment
	BLM A8	News Report Checklist	Assessment
1.3 Similar Triangles			
	BLM 1.3.1	Practice: Similar Triangles	Practice
	BLM 1.3.2	Achievement Check Rubric	Assessment
	BLM G1	Grid Paper	Student Support
	BLM G2	Protractor	Student Support
	BLM T1	<i>The Geometer's Sketchpad</i> ® 4	Technology
1.4 Solve Problems Using Similar Triangles			
	BLM 1.4.1	Practice: Solve Problems Using Similar Triangles	Practice
	BLM 1.4.2	Investigate: Find the Height of Your School's Flagpole	Student Support
	BLM A6	Group Work General Scoring Rubric	Assessment
	BLM T1	<i>The Geometer's Sketchpad</i> ® 4	Technology
Chapter 1 Review			
	BLM 1.CR.1	Chapter 1 Review	Review
	BLM G1	Grid Paper	Student Support

	Title		Purpose
Chapter 1 Practice Test			
	BLM 1.PT.1	Chapter 1 Practice Test	Diagnostic Assessment
	BLM 1.CT.1	Chapter 1 Test	Summative Assessment
	BLM G1	Grid Paper	
	BLM T1	<i>The Geometer's Sketchpad® 4</i>	Technology
Chapter 1 Problem Wrap-Up			
	BLM 1.CP.1	Chapter 1 Problem Wrap-Up Rubric	Assessment

Student Text Pages

4–5

Suggested Timing

80–160 min

Related Resources

BLM 1.GR.1 Practice: Get Ready
BLM 1.GR.2 Get Ready Self-Assessment Checklist

Common Errors

- Some students may forget to find, or how to find, common denominators when adding and subtracting fractions.
- R_x Spend some time consolidating how to work with LCD, and provide additional practice as needed.
- Some students may find identifying complementary and supplementary angles confusing.
- R_x Suggest using a mnemonic: complementary angles add to 90°; supplementary to 180°, C for complementary comes before S for supplementary in the alphabet and 90° is smaller than 180°.
- Some students may find identifying which angles are alternate and which angles are corresponding confusing.
- R_x Using chalk, draw intersecting lines on the floor. Have students stand on the angles and state which students are the alternate angles and which students are the corresponding angles. Or, distribute a diagram, and have students use colour to show the equal angles.

Accommodations

Gifted and Enrichment—Provide more complex questions that include the need for order of operations. Have students assist others.

Teaching Suggestions

- Chapter 1 has two distinctive themes: imperial measure and similar triangles. You may wish to assign Get Ready questions 1 and 2 before beginning Sections 1.1 and 1.2. Then, after completing Sections 1.1 and 1.2, assign Get Ready questions 3 to 5 before beginning Sections 1.3 to 1.5.
- All BLMs referred to in this chapter can be found on the *Foundations of Mathematics 10*: Teacher's Resource CD-ROM.

Questions 1 and 2

- Before assigning the questions, review the solutions for 1a) and 2a) with the class.
- You may wish to use Get Ready questions 1 and 2 as a diagnostic or self-assessment, or distribute **BLM 1.GR.2 Get Ready Self-Assessment Checklist**.

Questions 3 to 5

- Before assigning Get Ready questions 3 to 5, review the solutions for 3a), 4a), and 5a) with the class.
- Review with the class the terms *complementary*, *supplementary*, *alternate*, and *corresponding*. Refer students to the solution for 5a) for an example of supplementary angles.
- Use questions 3 to 5 as a diagnostic or self-assessment, or distribute **BLM 1.GR.2 Get Ready Self-Assessment Checklist**.
- The Get Ready is an excellent form of diagnostic assessment. Use it to determine students' preparedness to move on and to determine where remediation is necessary. The Get Ready also can be used by students as a self assessment. You may wish to have students use **BLM 1.GR.2 Get Ready Self-Assessment Checklist** as a self-assessment tool. Encourage students to seek assistance from you, or a classmate, or ask for **BLM 1.GR.1 Practice: Get Ready** in the areas where they feel they need help before moving on. This is an opportunity for students to gain confidence in what they already know.
- Assign **BLM 1.GR.1 Practice: Get Ready** for additional remediation as required.

Assessment

- Assess student readiness to proceed by informal observation as students are working on the questions. A formal test would be inappropriate since this material is not part of the grade 10 curriculum for this chapter.
- Student self-assessment is also an effective technique; students can place a checkmark beside topics in the Get Ready in which they feel confident with the necessary skills. You may wish to use **BLM 1.GR.2 Get Ready Self-Assessment Checklist** as a self-assessment for students.
- Remedial action can be taken in small groups or with a whole class skills review.

Chapter Problem

- Have students discuss their understanding of the topic, and consider how Darren's problem relates to the Chapter Opener.
- The Chapter Problem questions throughout the chapter are designed to help students move toward the Chapter Problem Wrap-Up. You may wish to assign these questions as students work through the sections. Alternatively, you may wish to assign the Chapter Problem questions and Chapter Problem Wrap-Up when students have completed the chapter, as part of a summative assessment.