

1.4

Focus on Representing

Strand:

Number Sense and Algebra

Student Text Pages

19 to 22

Suggested Timing

80 min

Tools

- centimetre grid paper

Related Resources

BLM A4 Presentation Checklist

BLM 1.4.1 Practice: Focus on Representing

BLM G9 Centimetre Grid Paper

BLM A11 Group Work Assessment Recording Sheet

BLM A12 Group Work Assessment General Scoring Rubric

Mathematical Process Expectations Emphasis

- Problem Solving
- Reasoning and Proving
- Reflecting
- Selecting Tools and Computational Strategies
- Connecting
- Representing
- Communicating

Specific Expectations

Manipulating Expressions and Solving Equations

NA2.01 simplify numerical expressions involving integers and rational numbers, with and without the use of technology;

NA2.02 solve problems requiring the manipulation of expressions arising from applications of percent, ratio, rate, and proportion.

Warm-Up

1. Plot each of the following points. What shape do the points form?

a) (3, 0), (3, 5), (0, 5), (0, 0)

b) (-2, 5), (-2, 2), (6, 2)

c) (7, -1), (5, -4), (-3, -4), (-1, -1)

2. What is $\frac{1}{2}$ of $\frac{1}{2}$ of $\frac{1}{2}$ of $\frac{1}{2}$?

Warm-Up Answers

1. a) rectangle

b) right triangle

c) parallelogram

2. $\frac{1}{16}$

Teaching Suggestions

- Both mathematical and real-life situations can be expressed using many different representations, for example, verbally, with a diagram, numerically, and algebraically.
- In the Investigate, students are asked to represent the situation in words, numerically, and with a diagram. The strategy of working backward is effective here because the end result is known and the steps can be reversed. (10 min)
- As a follow up, have students research shipwreck diving in Ontario on the Internet or in the library and prepare a presentation on their findings. Information on Fathom Five National Marine Park can be found at <http://canadianparks.com/ontario/ffivemp/index.htm>. You may wish to use **BLM A4 Presentation Checklist** to assess students' presentation skills.
- For the Example, have students act it out to help them in the problem-solving process. (10 min)
- Alternate solution to the Example: Each of the 8 people could shake 7 hands. We must then divide by 2 because each person would shake another person's hand twice: $8 \times 7 \div 2 = 28$ handshakes.
- Assign and discuss the Communicate Your Understanding questions. (10 min)
- Assign and take up Practise questions 1 to 3. (20 min)
- Use **BLM 1.4.1 Practice: Focus on Representing** as extra practice or remediation.

Ongoing Assessment

- Communicate Your Understanding questions can be used as quizzes to assess students' Communication skills.

Accommodations

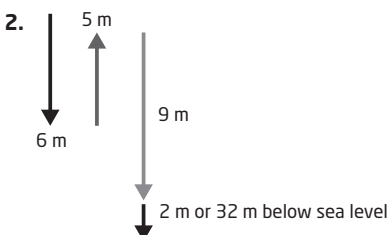
Spatial—Allow students to use a graphing calculator when plotting points to determine patterns.

Language—Encourage students to work in groups to complete the questions in this section.

ESL—Encourage students to use a translator to understand the meaning of the new words in this section.

Investigate Answers (page 19)

1. Kevin is diving in a shipwreck. He dives down 6 m, swims 5 m up, dives down 9 m, and then another 2 m. He is now at 32 m below the surface. Where was he when he was at the beginning.



3. $-32 \text{ m} + 2 \text{ m} + 9 \text{ m} - 5 \text{ m} + 6 \text{ m} = -27 \text{ m}$

4. $-32 \text{ m} + 2 \text{ m} + 9 \text{ m} - 5 \text{ m} + 6 \text{ m} = -27 \text{ m}$

Communicate Your Understanding Responses (page 20)

- C1. Answers will vary. A sample answer: Use algebra to represent the situation.

Then, solve the equation:

$$x - 6 + 5 - 9 - 2 = -32; x = -27$$

- C2. The first girl, Sarah, is 12 m ahead of the last girl, Barbara. Students' answers on how to solve this problem will vary. A sample answer: Draw a labelled diagram and add the distances between the first and last of the girls.

Practise

A diagram will help in each of questions 1 to 4. Working backward will also help in question 1.

Connect and Apply

Questions 5 and 8 help the student represent patterns and shapes graphically and will benefit them when discussing relationships in Chapter 2.

You may wish to use **BLM G9 Centimetre Grid Paper** for questions 5 and 8.

In question 6, students need to convert to a common denominator in diagram form. In part 6a), students would shade in sixths.

In question 7, it would help to represent the gears in ratio form.

Extend

In question 9, students need to determine the height needed to give an area of 15 square units, and apply the method used in question 8. You may wish to use **BLM G9 Centimetre Grid Paper**.

In question 10, students need to determine what effect, if any, another cog has on the number of turns. In this situation, a middle gear has no effect on the number of turns by the first gear because the middle gear simply transfers the force to the third gear.

Literacy Connections

Strategies

Have students list all the strategies they have devised this chapter. Ask students, *How can you remind yourself of the different ways to represent information? Can you think of any more mnemonics? Is there one type of representation you like more than the others? Explain your reasons.* With a partner, have students compare what strategies they like. You may wish to use **BLM A12 Group Work Assessment Recording Sheet** and/or **BLM A13**

Group Work Assessment General Scoring Rubric to assist you in assessing your students.

Exercise Guide

Category	Question Number
Minimum (essential questions for all students to cover the expectations)	1–5
Typical	1–8
Extension	9, 10