4.1 Enlargements and Reductions

Explore How to Enlarge an Image

The following notes provide guidelines to help you adapt the Explore How to Enlarge an Image section from *MathLinks 9*.

- Read the introduction aloud and discuss the information provided.
- Discuss the meaning of *magnification*, *objective lens*, and *strategies*.
- Give students rulers to use for their drawings and review how to measure with a ruler.
- Review the meaning of *double*, *half*, *increase*, and *decrease* before assigning the questions.

Examples

Working Example 1:

- Remind students to measure all sides of the object.
- Explain that Method 1 uses larger grid paper to enlarge the picture. Therefore, the new picture should cover the same number of grid squares.
- In Method 2, students need to multiply each dimension by the scale factor to draw the image. The new image will cover more grid squares.
- In the Show You Know, remind students to count the horizontal and vertical grid squares in the diagram to determine the original size of the object. Then, they can use the horizontal and vertical measurements to enlarge the object.

Working Example 2:

- Explain that Method 1 and Method 2 use the same concepts as in Working Example 1, except the image is getting smaller, not larger.

Communicate the Ideas, Practise, and Apply

- For #3, remind students that a scale factor
  - greater than 1 is an enlargement
  - less than 1 is a reduction
  - equal to 1 does not change the size of the object
- Remind students that when enlarging or reducing, they must multiply by the scale factor.
- Provide students who need additional practice with **BLM 4–2 Section 4.1 Extra Practice**.

Math Link

- You may wish to show images of different drums on an interactive whiteboard or an overhead projector.
- Encourage students to use a simple scale factor if they are struggling with drawing enlargements and reductions.

Common Errors

- When using the scale factor to reduce, some students may divide by the scale factor (less than 1). For example, when reducing 4 cm by half, they may write $4 \text{ cm} \div 0.5 = 8 \text{ cm}$.

R_x Explain that half of 4 is not 8, therefore this is incorrect. They need to multiply by 0.5 ($4 \text{ cm} \times 0.5 = 2 \text{ cm}$). Students may recognize that multiplying by 0.5 is the same as dividing by 2. If they want to calculate by dividing by 2, this is acceptable ($4 \text{ cm} \div 2 = 2 \text{ cm}$).