

**LESSON** **Technology Lab Recording Sheet** pp. 722–723  
**10-8** **Compare Surface Areas and Volumes**

**Try This**

**Activity 1**

4. Choose several values for L, W, and H to create rectangular prisms that each have the same volume as the first one. Which has the least surface area?

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Sketch the prism and describe its shape in words. (Is it tall or short, skinny or wide, flat or cubical?)

Make a conjecture about what type of shape has the minimum surface area for a given volume.

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**Try This**

1. Repeat Activity 1 for cylinders. Create columns for radius R, height H, surface area SA, volume V, and ratio of surface area to volume SA/V. What shape cylinder has the minimum surface area for a given volume? (*Hint:* To use  $\pi$  in a formula, input “PI( )” into your spreadsheet.)

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2. Investigate packages such as cereal boxes and soda cans. Do the manufacturers appear to be using shapes with the minimum surface areas for their volume? What other factors might influence a company’s choice of packaging?

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**LESSON**  
**10-8**

**Technology Lab Recording Sheet**

**Compare Surface Areas and Volumes** continued

**Activity 2**

- Chose several more values for L and W, and calculate H so that  $SA = 112$ . Examine the V and SA/V columns. Which prism has the greatest volume?

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Sketch the prism and describe it in words.

Make a conjecture about what type of shape has the maximum volume for a given surface area.

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**Try This**

- Repeat Activity 2 for cylinders. Create columns for radius R, height H, surface area SA, volume V, and the ratio of surface area to volume SA/V. What shape cylinder has the maximum volume for a given surface area?

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- Solve the formula  $SA = 2LW + 2LH + 2WH$  for H. Use your result to explain the formula that was used to find H in Activity 2.

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- If a rectangular prism, a pyramid, a cylinder, a cone, and a sphere all had the same volume, which do you think would have the least surface area? Explain.

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Which would have the greatest surface area? Explain.

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- Use a spreadsheet to analyze what happens to the ratio of surface area to volume of a rectangular prism when the dimensions are doubled. Explain how you set up the spreadsheet and describe your results.

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