

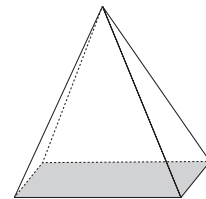
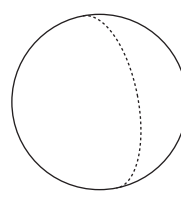
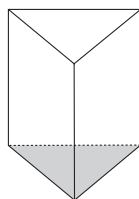
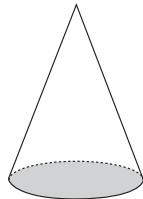
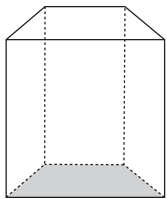
Cruisin' for a Bruisin' Lab (continued)

Label

This label is designed to be placed on each piece of fruit with the company's name and logo. It should be appealing to customers. Sketch your label idea below and share with your group members. Your group will choose one label design for your final fruit package.

Package Construction

1. Determine the size and shape of the package needed to contain your fruit.



Measure the width, or diameter, and height of your piece of fruit and include units.

Diameter = _____ $\frac{1}{2}$ diameter = _____ radius

Height = _____

What is the volume of your piece of fruit? *Volume of a sphere* = $(\frac{4}{3})\pi r^3$

Volume = _____

Based on this information, the package needs to be at least _____ tall and _____ wide and hold a volume of _____ (Leave some extra space for padding materials.)

You may wish to wrap your fruit. Calculate the surface area of your fruit to determine the amount of wrapping you will need. *Surface area of a sphere* = $4\pi r^2$

Surface area of fruit = _____

Cruisin' for a Bruisin' Lab *(continued)*

2. After researching packaging materials and determining package size, brainstorm designs and materials that might work for packaging the piece of fruit.

- ▶ Sketch your design idea and label the dimensions. Make a list of materials.

Sketch	Materials

- ▶ For homework, gather the necessary packaging materials. Look in your recycling bins at home or at school for materials that can be repurposed. Materials should be clean so they do not contaminate the fruit.
3. Bring your packaging materials to class and work in your group. Each group member will construct their own fruit package prototype.
4. Present your package prototype to your group members.
- ▶ As a group, you will evaluate each group member's package prototype for design and wise use of materials. Use the packaging rubric to score each package.
 - ▶ Next, test the durability of your package prototype by adding masses of varying sizes to the top of the package. For example, you could place one or several books on top of the package. Note any sagging, ripping, or breaking.

Cruisin' for a Bruisin' Lab *(continued)*

Durability Test

Mass placed on package	Observations

- ▶ Following the durability test, report back to your group and use the rubric to rate the durability of your packaging.
- ▶ The package design with the highest score from the rubric will be chosen to represent your group in the class competition for the best package design.
- ▶ As a group, make any final upgrades to the winning package prototype and fill in the chart below with details about your selected packaging. Look up the cost of materials on the Web.

Selected Group Package

Sketch
Materials
Cost of Materials
Dimensions

Cruisin' for a Bruisin' Lab *(continued)*

Shipping

Shipping cost to ship package from the nearest post office to our class.

Package weight (with fruit) = _____

Package size = _____ wide _____ long and _____ deep.

Use the U.S. Postal Service website at *postcalc.usps.com* and the required ZIP codes, date, and weight. Select the "Package" option (do not select the flat rate service). On the pricing page, select the "Other Options" bar to find the shipping cost for "Standard Post."

Shipping cost = \$_____

Total cost of package materials \$_____ + shipping \$_____ = \$_____

5. As a group, present your package design to the class.
 - ▶ Describe the materials used for construction, what they cost, whether or not they can be recycled, and how the package rated in the durability test.
 - ▶ The class will vote on the winning package design based upon which package is the most likely to deliver a visually appealing fruit product safely through the U.S. Postal Service in a cost effective manner.
 - ▶ The chosen package will be packed with a piece of fruit and shipped from the post office to the class address.
6. As a class, inspect the package and its fruit contents when it is delivered by mail to your classroom.
 - ▶ Describe the condition of the packaging.

 - ▶ Describe the condition of the fruit.

 - ▶ How could you improve the packaging?