

21ST CENTURY CAREER

in Landscape Architecture

Landscape Architect

Do you have an artistic side, and do you enjoy being outdoors? If so, a career in landscape design might be a perfect fit for you. Landscape architects design outside areas such as yards, parks, playgrounds, campuses, shopping centers, and golf courses. Their designed areas are not only meant to be beautiful, but also functional and compatible with the natural environment. A landscape architect must be proficient in mathematics, science, and the use of computer-aided design.



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Is This the Career for You?

Are you interested in a career as a landscape architect? Take some of the following courses in high school.

- ◆ Algebra
- ◆ Botany
- ◆ Drafting/Illustrative Design Technology
- ◆ Geometry
- ◆ Architectural Design

Find out how math relates to a career in Landscape Architecture.



MP Planting in Circles

For each problem, use the information in the designs.

- In Design 2, what is the radius of the larger grassy area? _____
- The small circular fountain in Design 1 is surrounded by a stone wall. Find the circumference of the wall. Use $\frac{22}{7}$ for π .

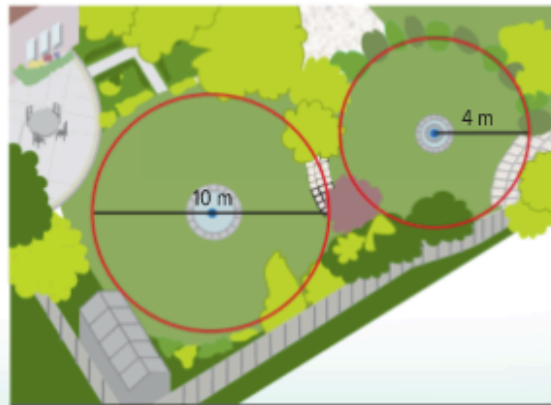
- Find the circumference of the smaller grassy area in Design 2. Use 3.14 for π .

- In Design 2, how much greater is the lawn area in the larger circle than in the smaller circle? Use 3.14 for π . _____
- In Design 2, the smaller circle is surrounded by a path 1 meter wide. What is the outer circumference of the path? Use the π key on a calculator and round to the nearest tenth.

- In Design 1, the area of the large circular patio is about 201.1 square feet. What is the radius of the patio? Round to the nearest foot. _____



Design 1



Design 2

MP Career Project

It's time to update your career portfolio! Download free landscaping software from the Internet and use it to create your own landscape design. Include a list of all the plants, materials, and hard elements used in your design. Also, provide an estimate of the total cost of the landscaping project.

What is something you really want to do in the next ten years?

- _____
- _____
- _____
- _____
- _____

Chapter Review



Vocabulary Check



Complete each sentence using the vocabulary list at the beginning of the chapter. Then **circle** the word that completes the sentence in the word search.

- The distance across a circle through its center is called the _____.
- The _____ is the distance from the center to any point on the circle.
- A _____ is the set of all points in a plane that are the same distance from a point.
- The point in a circle from which all other points are equidistant is called the _____.
- The distance around a circle is the _____.
- The ratio of circumference to diameter is called _____.
- A _____ is half of a circle.
- A _____ figure is made up of two or more shapes.
- The _____ of a three-dimensional figure is the measure of the space it occupies.
- The sum of the areas of all the faces of a three-dimensional figure is the _____ area.
- The triangular faces of a pyramid that are not bases are _____ faces.
- The height of each lateral face of a pyramid is called the _____ height.



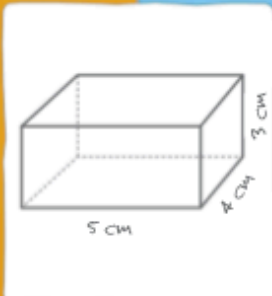
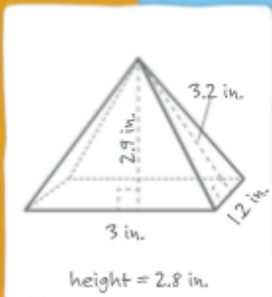
Key Concept Check

Use Your FOLDABLES

Use your Foldable to help review the chapter.

Tape here

Tape here

Volume	Volume =		Surface area =	Surface Area
	Volume =		Surface area =	
Tab 1				Tab 2

Got it?

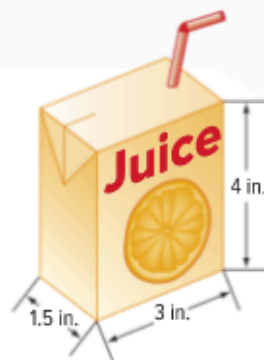
Circle the correct term or number to complete each sentence.

- The diameter of a circle is (twice, three times) its radius.
- The area of a circle equals the product of pi and the square of its (radius, diameter).
- The volume of a rectangular prism can be found by multiplying the area of the base times the (length, height).
- To find the surface area of a triangular prism, find the area of each face and calculate the (sum, product) of all the faces.

Power Up! Performance Task

Juice Box Packaging

Supreme Packaging Company manufactures juice boxes for juice companies. They are examining different ways to make the juice boxes using various lengths, widths, and heights. The measurements of one juice box are shown.



Write your answers on another piece of paper. Show all of your work to receive full credit.

Part A

What is the volume of the juice box shown? The company received an order to make a jumbo juice box that has twice the volume as the one shown. Could you double the current dimensions to make the jumbo juice box at the suggested volume? Explain.

Part B

Draw and label a net to find the surface area of the original juice box. It costs Supreme Packaging \$0.02 per square inch to create one juice box. The company groups eight juice boxes together as one package. How much does it cost to create one package?

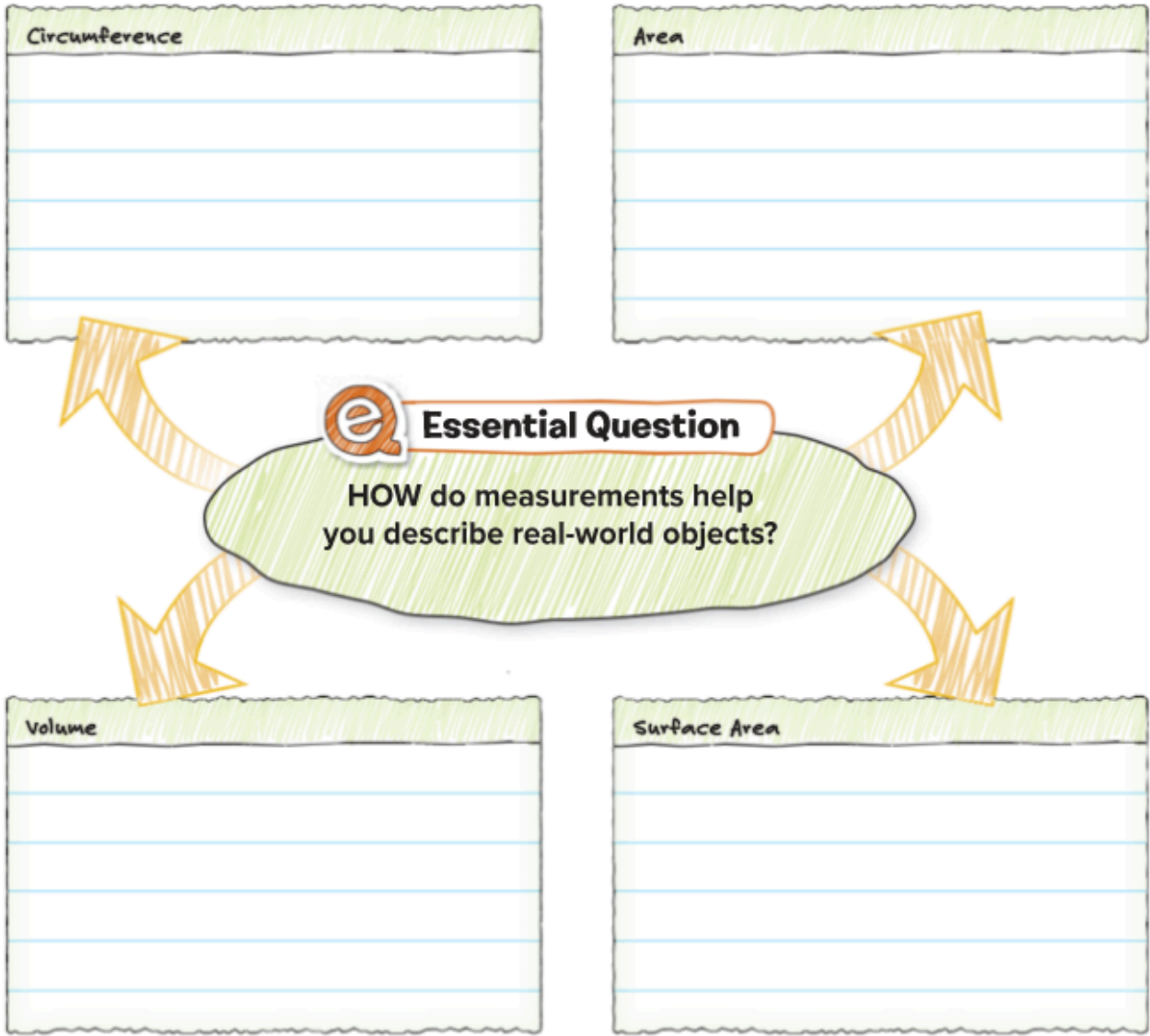
Part C


An artist created the picture of the citrus fruit on the label. The picture is a circle and has an area of 12.56 square inches. Will the artist's picture fit on the juice box label? Explain. Use 3.14 for π .

Reflect

Answering the Essential Question

Use what you learned about measuring figures to complete the graphic organizer.



 **Answer the Essential Question.** HOW do measurements help you describe real-world objects?

UNIT PROJECT



Turn Over a New Leaf The flatness of leaves serves an important purpose. In this project you will:

- **Collaborate** with your classmates as you research the primary function of leaves.
- **Share** the results of your research in a creative way.
- **Reflect** on how you use different measurements to solve real-life problems.



Collaborate



Go Online Work with your group to research and complete each activity. You will use your results in the Share section on the following page.

1. Suppose you have a cube that is 10 centimeters on each side. Find the volume, surface area, and surface area to volume ratio.
2. Disassemble the cube from Exercise 1 into centimeter cubes. Arrange the cubes in a 50-by-20-by-1 prism. Find the volume, surface area, and surface area to volume ratio.
3. Compare and contrast the volume, surface area, and surface area to volume ratio from Exercises 1 and 2.
4. Trace the outline of a leaf onto centimeter grid paper. Estimate the volume of the leaf. (Assume the height of your leaf is 0.1 centimeter.) Estimate the surface area. (You can ignore the edge of the leaf.) Find the surface area to volume ratio.
5. Do research to find the primary function of a leaf. Explain how the surface area to volume ratio of a leaf aids in its function.
6. Find examples from nature or man-made objects that have a small surface area to volume ratio. Explain the benefits.



Share

With your group, decide on a way to share what you have learned about the surface area to volume ratio of leaves. Some suggestions are listed below, but you could also think of other creative ways to present your information. Remember to show how you used mathematics to complete each of the activities in this project!

- Create a digital presentation that compares two types of leaves. Use what you learned about surface area to volume ratios in your presentation.
- Imagine you discovered a new type of leaf. Create an annotated diagram of your leaf. The annotations should include the type of information you learned in this project.

Check out the note on the right to connect this project with other subjects.




Environmental Literacy Write a paragraph detailing facts about the leaves you researched. Some questions to consider are:

- What are the names of the trees that dropped these leaves?
- Are these types of trees common in your state?



Reflect

6.  **Answer the Essential Question** How can you use different measurements to solve real-life problems?

a. How did what you learned about geometric figures help you use different measurements to solve real-life problems in this project?

b. How did what you learned about measuring figures to help you use different measurements to solve real-life problems in this project?
