

SeaWorld Skytower

OBJECTIVES

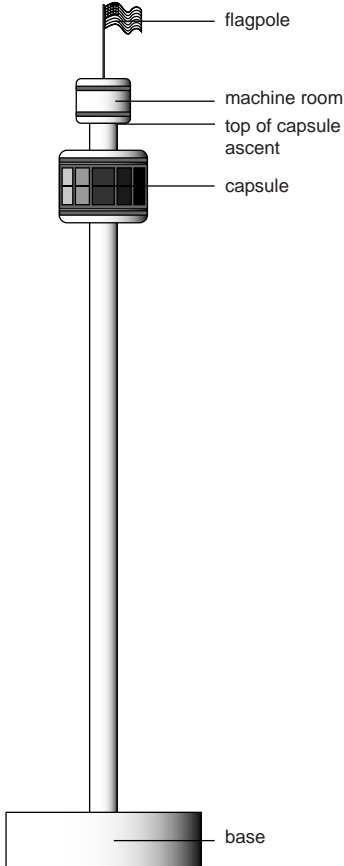
Students read and construct scale drawings and/or models. They practice ratio and geometry skills. They make decisions about how to approach problems and use skills, concepts, and strategies to find solutions.

MATERIALS

- overhead transparency (or copies for each student) of SeaWorld Skytower dimensions and diagram below (enlarge 150%)
- graph paper or modeling materials such as clay or dough, or cardboard and tape or glue
- calculators
- pencil and paper

BACKGROUND

The SeaWorld Skytowers are landmarks in San Diego, California and Orlando, Florida. In this exercise, students explore the SeaWorld San Diego Skytower's dimensions and operating capacity. This activity may be done individually or in learning groups.

SEAWORLD SKYTOWER DIMENSIONS AND OPERATING SPECIFICATIONS	
	height from base of tower to top of flagpole320 ft.
	height from base of tower to top of capsule ascent . . .260 ft.
	diameter of tower8 ft.
	diameter of capsule24 ft.
	height of capsule20 ft.
	diameter of machine room on top of tower16 ft.
	height of machine room11 ft.
	height of flagpole (including height of flag)39 ft.
	dimensions of American flag25 ft. by 15 ft.
	seating capacity55 people
	hours of operation (spring)11 a.m.-5 p.m.
	duration of ride5 minutes
	speed of ride1.7 mph
	number of revolutionstwo on ascent, two on top, two on descent
	time to load and unload ride5-10 minutes



ACTION

1. Students use the given dimensions to make a scale drawing or scale model of the SeaWorld Skytower. Assist them in determining a scale ratio that is workable and practical, and allow more than one class period if necessary.
2. When their models or drawings are completed, have each student or learning group describe to the class how they determined their scale, how they designed the model or drawing, and what challenges they faced. Allow the rest of the class to respond to each group's completed model or drawing.
3. In a separate class period, ask students to use the operating specifications data to estimate the maximum number of passengers that can ride the Skytower in one day. Ask students to share their methods for solving this problem. What assumptions did they make to be able to find a solution?
4. Ask students to calculate the distance a passenger would travel in one



SeaWorld's Tree of Lights is made of 2,168 25-watt light bulbs strung from the tip of the Skytower.

round-trip ride. Before they do any calculations, ask them first to determine what unit of measure they will use in their answer, then to outline their problem-solving logic and methodology. What assumptions will they make to be able to find a solution?

ANSWERS

3. *Determining the maximum number of passengers in one day:*
 Assuming 7.5 minutes to load and unload, $7.5 + 5 = 12.5$ minutes per trip
 $60 \text{ minutes per hour} \div 12.5 \text{ minutes per trip} = 4.8 \text{ trips per hour}$
 $4.8 \text{ trips per hour} \times 6 \text{ hours of operation} = 28.8 \text{ trips (round up to 29 trips)}$
 $29 \text{ trips} \times 55 \text{ passengers per trip} = 1,595 \text{ passengers in one day}$
4. *Calculating distance traveled in one trip:*
 Using units of number of feet traveled up and down:
 $2 \times (260 - 20) = 480 \text{ feet}$
 Using units of number of feet traveled around:
 Diameter of capsule is 24 feet and diameter of tower is 8 feet.
 If we assume that people sit in the middle of the donut-shaped capsule, the diameter of seating is $24 - 8 = 16$ feet, and the radius of the circle of seats is 8 feet.
 $2\pi r = 2 \times 3.14 \times 8 = 50.24 \text{ feet per revolution.}$
 The capsule makes a total of 6 revolutions, and $6 \times 50.24 = 301.44 \text{ feet.}$