

Architecture Mapping

Answer Key

Name: _____

Date: _____

Vocabulary

Architecture - the art or practice of designing and constructing buildings

Surface Area - the measure of the total area that the surface of an object occupies

Volume - the amount of space that an object occupies

Activity 1

Using the provided Supplemental Materials and the diagrams below as reference, measure relevant information to accurately calculate the area, perimeter, surface area, and volume of a few of the seven wonders of the world.

Since these are complex architectural structures, you may need to measure multiple sections and add measurements together to find the total measurements.

Sections of each architectural structure are labeled to help with identification purposes. Be sure to measure all of the information needed in each section.

Architecture Mapping

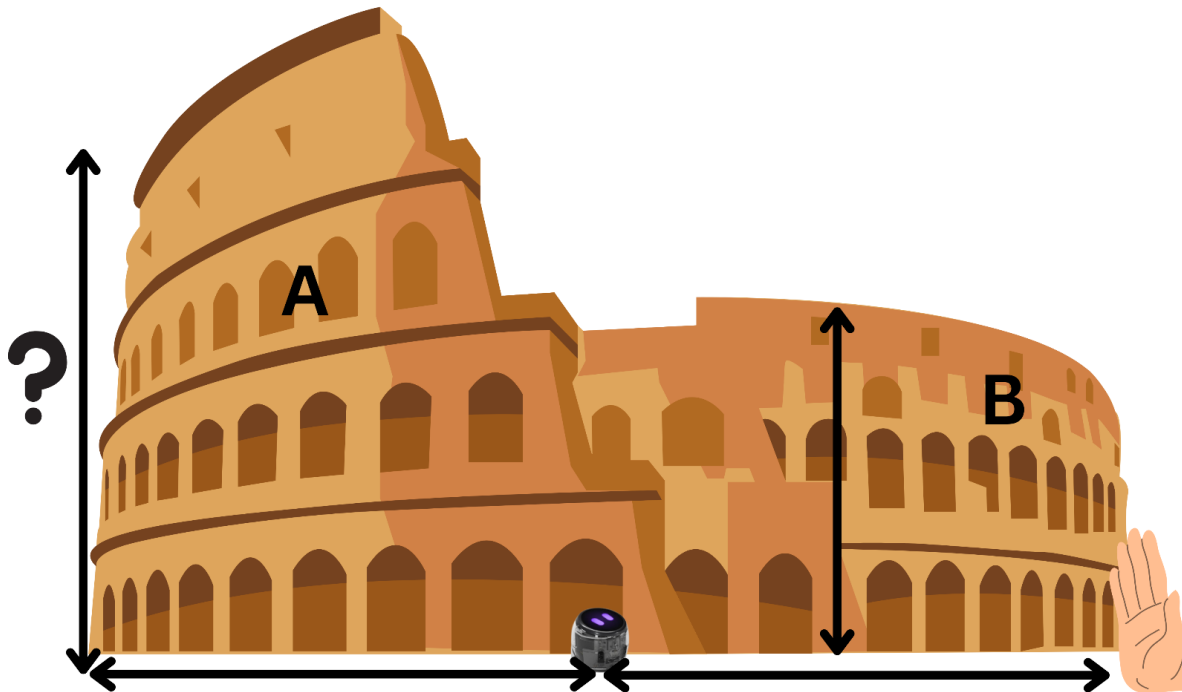
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1

Colosseum



Part A

Part B

Length: 2.0 inches

Length: 1.3 inches

Width: 2.2 inches

Width: 1.9 inches

Area = $length \times width$
4.4 inches²

Area = $length \times width$
2.47 inches²

Perimeter = $2(length + width)$
8.4 inches

Perimeter = $2(length + width)$
6.4 inches

Total Area = Part A Area + Part B Area
4.4 + 2.47 = 6.87 inches²

Total Perimeter = Part A Perimeter + Part B Perimeter
8.4 + 6.4 = 14.8 inches

Architecture Mapping

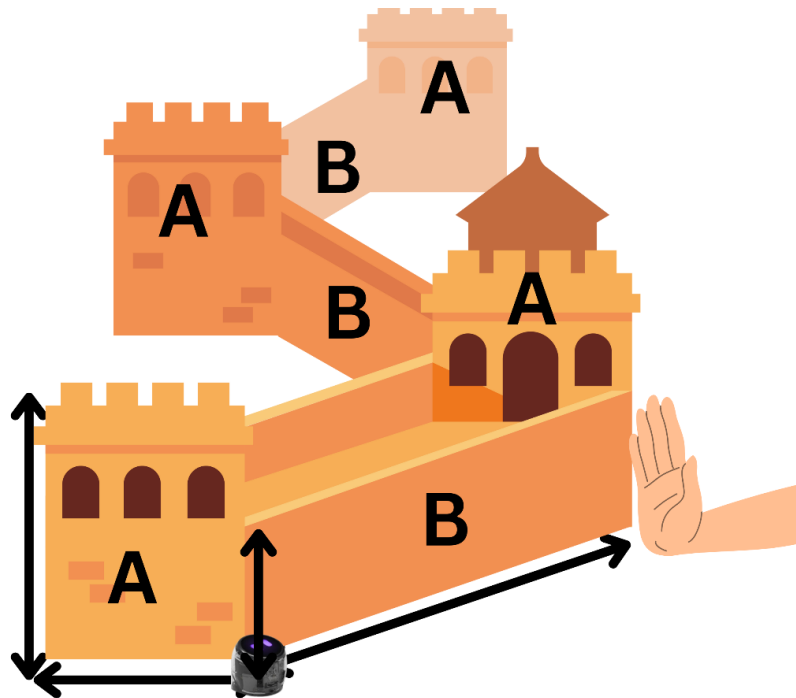
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2

Great Wall of China



Part A

Length: 0.8 inches

Width: 1.5 inches

Area = $length \times width$
1.2 inches²

Perimeter = $2(length + width)$
4.6 inches

Total Area = $Part\ A\ Area \times 4 + Part\ B\ Area \times 3$
 $1.2 \times 4 + 0.68 \times 3 = 6.84\ inches^2$

Total Perimeter = $Part\ A\ Perimeter \times 4 + Part\ B\ Perimeter \times 3$
 $4.6 \times 4 + 4.2 \times 3 = 31\ inches$

Part B

Length: 1.7 inches

Width: 0.4 inches

Area = $length \times width$
0.68 inches²

Perimeter = $2(length + width)$
4.2 inches

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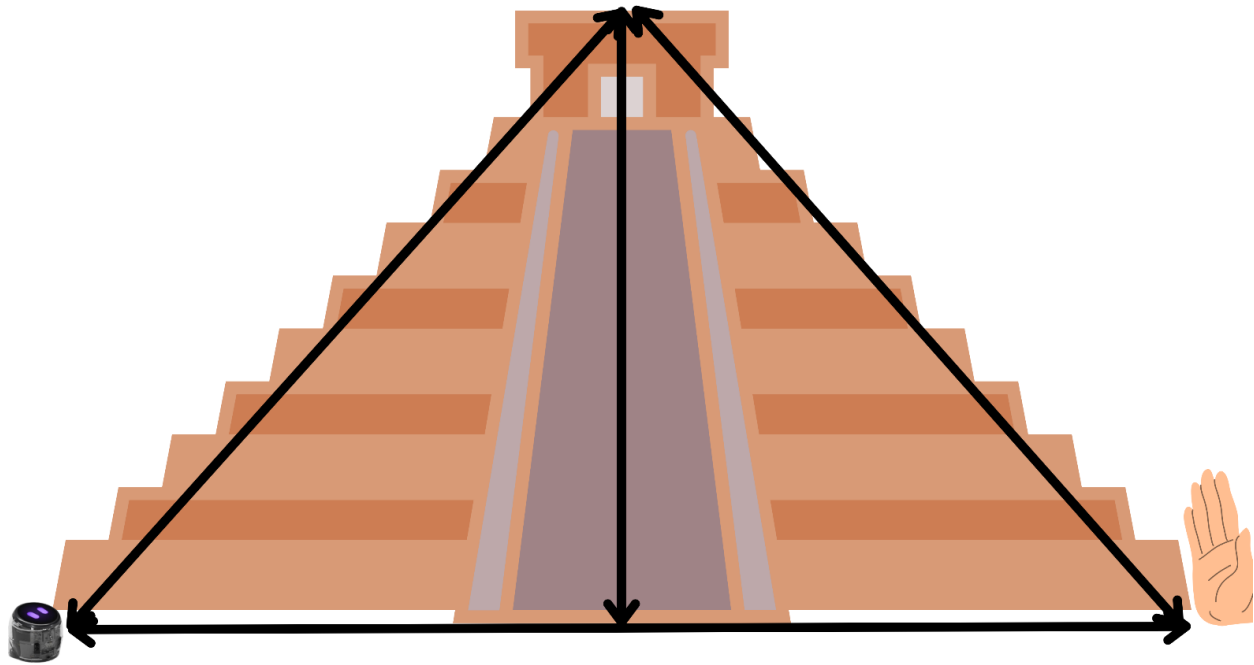
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3

Chichén Itzá



Base: 1.9 inches

Height: 2.4 inches

Side2: 2.5 inches

Side3: 2.4 inches

Area = $\frac{1}{2} \text{ base} \times \text{height}$
 $\frac{1}{2} \times 1.9 \times 2.4 = 2.28 \text{ inches}^2$

Perimeter = $\text{base} + \text{side2} + \text{side3}$
 $1.9 + 2.5 + 2.4 = 6.8 \text{ inches}$

Architecture Mapping

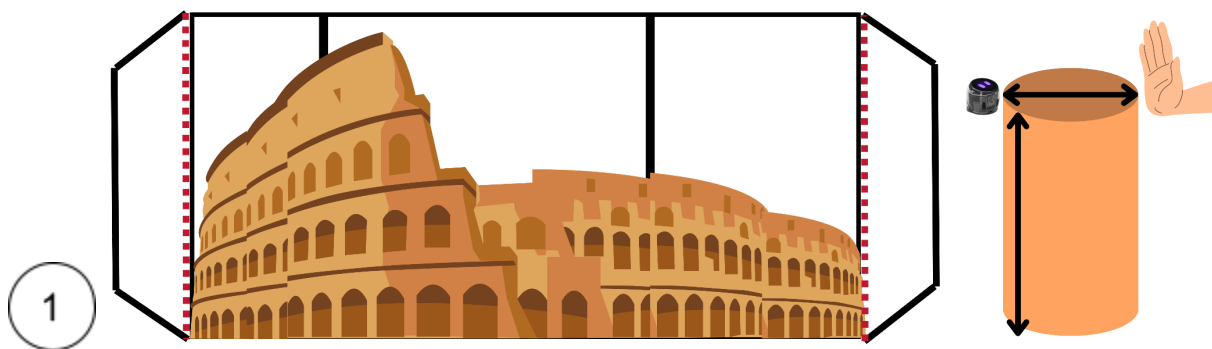
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Activity 2

Using the cutouts of the Colosseum and Chichén Itzá, fold on the dashed red lines to construct the three-dimensional models.



Radius: (*Diameter* / 2) 1.7 inches / 2

Height: 2 inches

Surface Area = $2 \times \pi \times \text{radius}(\text{height} + \text{radius})$
 $2 \times 3.14 \times 0.85(2 + 0.85) = 11.526 \text{ inches}^2$

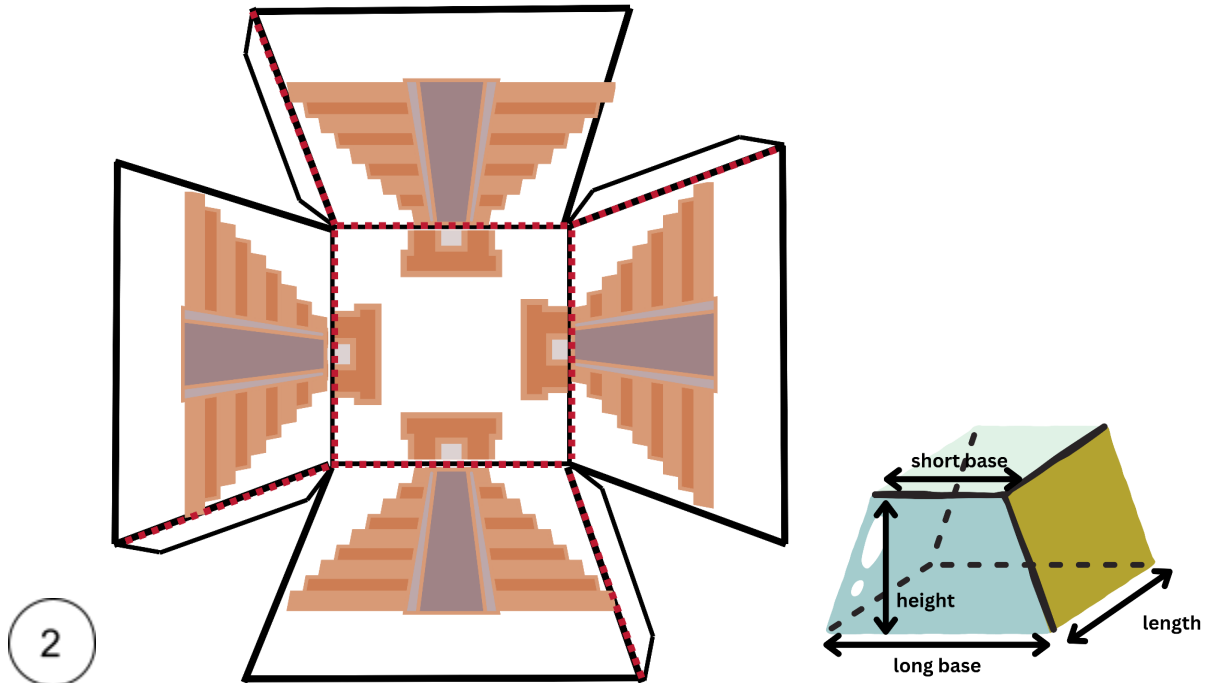
Volume = $\pi \times \text{radius}^2 \times \text{height}$
 $3.14 \times 0.85^2 \times 2 = 4.53 \text{ inches}^3$

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Short base: 1.7 inches

Long Base: 2.8 inches

Height: 2.0 inches

Length: 3.0 inches

Volume = $\frac{1}{2} (\text{short base} + \text{long base}) \times \text{height} \times \text{length}$

$\frac{1}{2} (1.7 + 2.8) \times 2.0 \times 3.0 = 14.28 \text{ inches}^3$

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Exit Ticket

Please respond to the following prompts.

1. Question 1: What types of three-dimensional shapes could be used to represent the Great Wall of China? Rectangular prisms of different sizes could be used to represent the Great Wall of China. They could be connected together to form the towers and the wall.
2. Question 2: How does calculating the surface area of a three-dimensional object differ from calculating the area of a two-dimensional object? When calculating the surface area of three-dimensional shapes, multiple bases must be measured and various lengths and heights included in the calculations. When working with a two-dimensional shape and calculating its area, the depth of the shape isn't included and therefore, not measured.

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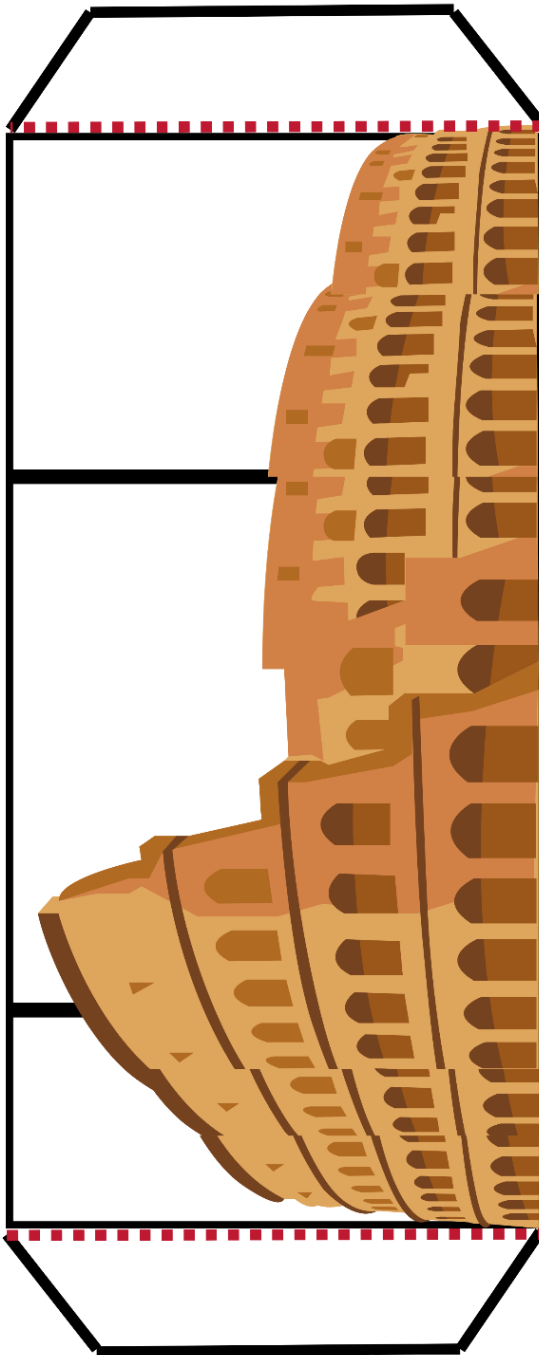
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Supplemental Materials

Name: _____

Date: _____

Cut along the perimeter and fold along the red dotted line.



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