

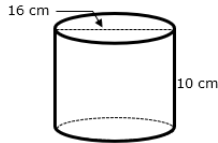
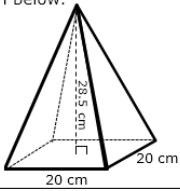
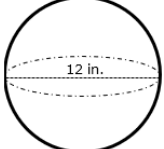
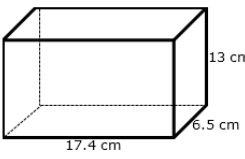
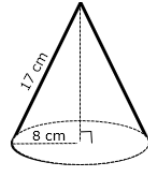
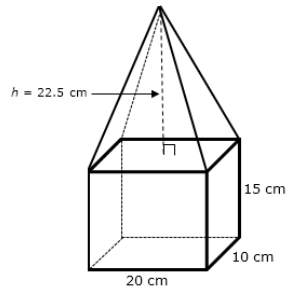
# Geometry Critical TEKS Kit

TEKS G.11C – apply the formulas for the total and lateral surface area of three-dimensional figures, including prisms, pyramids, cones, cylinders, spheres, and composite figures, to solve problems using appropriate units of measure.

## Activity Directions:

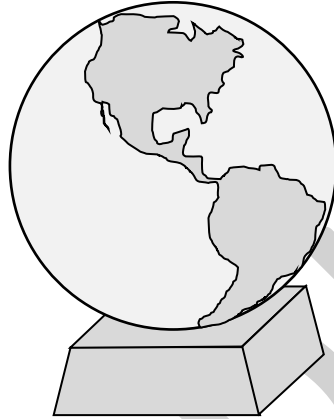
**Materials Needed:** Copy of activity, scissors, formula chart, glue, color pencils/highlighters and calculator per student.

1. Students use the bank to match the formulas to the provided figures.
2. Students calculate the lateral and total surface area of each figure.
3. The correct surface area measurements are included in the bank.
4. Once finished, the pages can be cut apart and put together as a booklet or added to an interactive notebook as reference for the practice problems and studying.
5. Have students complete practice questions coded to G.11C.

<p><b>P</b> = perimeter of the Base;  <b>B</b> = area of the Base;  <b>h</b> = altitude or perpendicular height;  <b>l</b> = slant height;  <b>r</b> = radius;</p> <p><b>P</b> = perimeter of the Base;  <b>B</b> = area of the Base;  <b>h</b> = altitude or perpendicular height;  <b>l</b> = slant height;  <b>r</b> = radius;</p> <p><b>P</b> = perimeter of the Base;  <b>B</b> = area of the Base;  <b>h</b> = altitude or perpendicular height;  <b>l</b> = slant height;  <b>r</b> = radius;</p> <p><b>P</b> = perimeter of the Base;  <b>B</b> = area of the Base;  <b>h</b> = altitude or perpendicular height;  <b>l</b> = slant height;  <b>r</b> = radius;</p>	<p>A figure is shown below. Use 3.14 for <math>\pi</math>.</p> 	<p>A figure is shown below.</p> 	<p>A figure is shown below. Use 3.14 for <math>\pi</math>.</p> 						
	<p>What formulas can be used to find the lateral and total surface areas of this figure?</p>	<p>What formulas can be used to find the lateral and total surface areas of this figure?</p>	<p>What formulas can be used to find the lateral and total surface areas of this figure?</p>						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"><math>LA = 2\pi rh</math></td> <td style="width: 50%; text-align: center;"><math>SA = 2\pi rh + 2\pi r^2</math></td> </tr> </table>	$LA = 2\pi rh$	$SA = 2\pi rh + 2\pi r^2$	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"><math>LA = \frac{1}{2}Pl</math></td> <td style="width: 50%; text-align: center;"><math>SA = \frac{1}{2}Pl + B</math></td> </tr> </table>	$LA = \frac{1}{2}Pl$	$SA = \frac{1}{2}Pl + B$	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="width: 50%; text-align: center;"><math>SA = 4\pi r^2</math></td> </tr> </table>		$SA = 4\pi r^2$
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<p>What are the lateral and total surface area measures of this figure?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"><math>LA = 502.4 \text{ cm}^2</math></td> <td style="width: 50%; text-align: center;"><math>SA = 904.32 \text{ cm}^2</math></td> </tr> </table>	$LA = 502.4 \text{ cm}^2$	$SA = 904.32 \text{ cm}^2$	<p>What are the lateral and total surface area measures of this figure?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"><math>LA = 1,208 \text{ cm}^2</math></td> <td style="width: 50%; text-align: center;"><math>SA = 1,608 \text{ cm}^2</math></td> </tr> </table>	$LA = 1,208 \text{ cm}^2$	$SA = 1,608 \text{ cm}^2$	<p>What are the lateral and total surface area measures of this figure?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"></td> <td style="width: 50%; text-align: center;"><math>SA = 452.16 \text{ in}^2</math></td> </tr> </table>		$SA = 452.16 \text{ in}^2$	
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	$SA = 452.16 \text{ in}^2$								
1	1	4	5						
<p>A figure is shown below.</p> 	<p>A figure is shown below. Use 3.14 for <math>\pi</math>.</p> 	<p>A composite figure is shown below.</p> 	<p>Complete the following.</p> <ul style="list-style-type: none"> <li>• What is <b>Surface Area</b>? Surface area is the measure of the total area that the surface of an object occupies.</li> <li>• What is <b>Lateral Surface Area</b>? Lateral surface area is the area of all the sides of an object, excluding the area of its base and top.</li> <li>• What is <b>Total Surface Area</b>? Total surface area is the total area of all the sides of a three-dimensional object OR the total area a sphere, cube, or cone occupy in space.</li> <li>• How can you calculate surface area? Formulas can be used OR the sum of the independent areas of each part can be summed to calculate a total.</li> </ul>						
<p>What formulas can be used to find the lateral and total surface areas of this figure?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"><math>LA = Ph</math></td> <td style="width: 50%; text-align: center;"><math>SA = Ph + 2B</math></td> </tr> </table>	$LA = Ph$	$SA = Ph + 2B$	<p>What formulas can be used to find the lateral and total surface areas of this figure?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"><math>LA = \pi rl</math></td> <td style="width: 50%; text-align: center;"><math>SA = \pi rl + \pi r^2</math></td> </tr> </table>	$LA = \pi rl$	$SA = \pi rl + \pi r^2$	<p>Calculate the lateral surface area and the total surface area for the composite figure.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"><math>LA = 1,638.6 \text{ cm}^2</math></td> <td style="width: 50%; text-align: center;"><math>SA = 1,838.6 \text{ cm}^2</math></td> </tr> </table>	$LA = 1,638.6 \text{ cm}^2$	$SA = 1,838.6 \text{ cm}^2$	
$LA = Ph$	$SA = Ph + 2B$								
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$LA = 1,638.6 \text{ cm}^2$	$SA = 1,838.6 \text{ cm}^2$								
2	3	6	7						

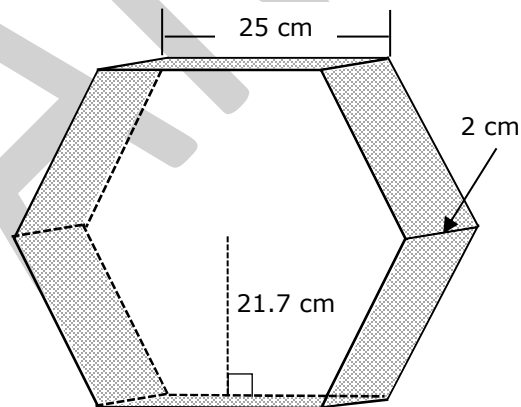
**TEKS G.11C** – **apply** the formulas for the total and lateral surface area of three-dimensional figures, including prisms, pyramids, cones, cylinders, spheres, and composite figures, to **solve** problems using appropriate units of measure.

1. Three spherical sculptures of the earth are painted with a protective sealant. What is the total surface area painted on the 3 sculptures if the diameter of each sphere is 36 inches? Round your final answer to the nearest whole number. Use 3.14 for  $\pi$ .



- A 4,069 in<sup>2</sup>  
 B 12,208 in<sup>2</sup>  
 C 16,278 in<sup>2</sup>  
 D 48,833 in<sup>2</sup>

2. A regular hexagonal cork board is decorated with colored duct tape around the 2 cm edge. What is the lateral area covered by the tape?

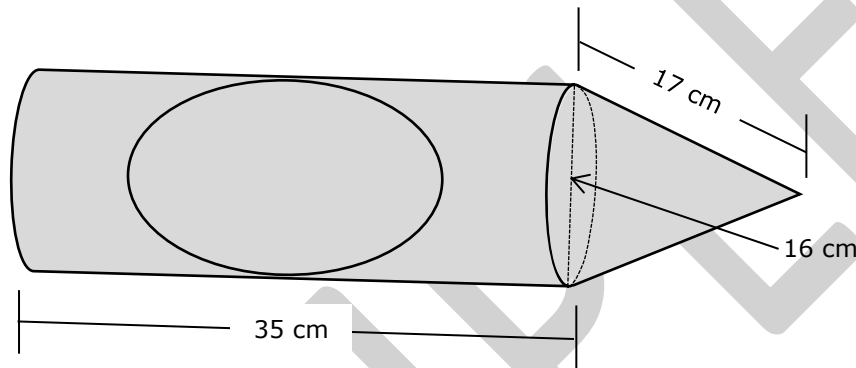


- F 300 cm<sup>2</sup>  
 G 3255 cm<sup>2</sup>  
 H 3555 cm<sup>2</sup>  
 J 50 cm<sup>2</sup>

3. Which is a real-world example of the surface area of a sphere?

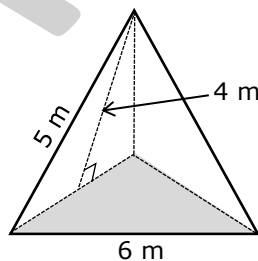
- A Air pressure in a soccer ball
- B Orange wedges
- C Orange peel
- D None of these

4. What is the surface area of the crayon-shaped container below that is composed of a cone and a cylinder with the same diameter of 16 cm? Round your final answer to the nearest tenth. Use 3.14 for  $\pi$ .



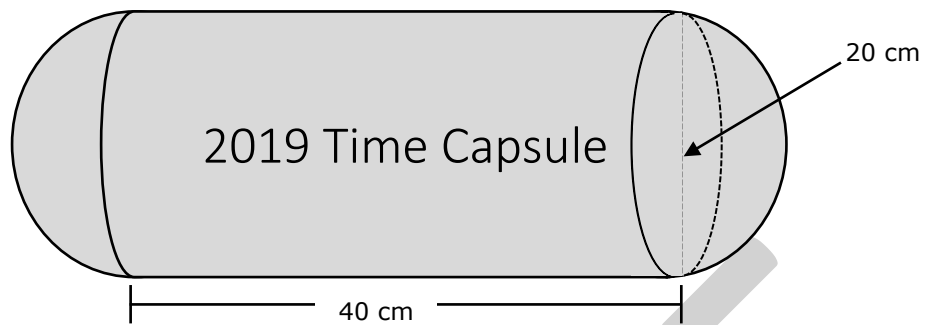
- F  $2587.4 \text{ cm}^2$
- G  $201 \text{ cm}^2$
- H  $2185.4 \text{ cm}^2$
- J  $2386.4 \text{ cm}^2$

5. The triangular pyramid below has a base of an equilateral triangle. What is the lateral surface area of the pyramid?



- A  $36 \text{ m}^2$
- B  $12 \text{ m}^2$
- C  $45 \text{ m}^2$
- D  $48 \text{ m}^2$

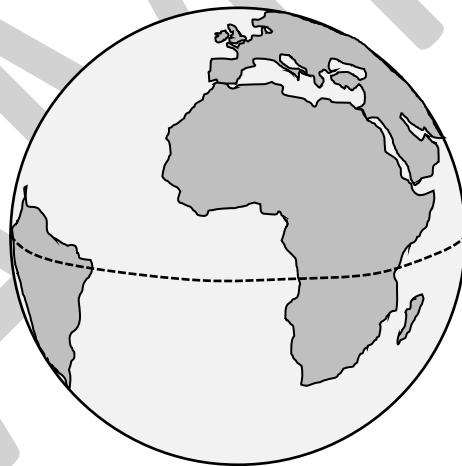
6. A time capsule will be stored underground for 30 years. What is the total surface area of the capsule? Round your final answer to the nearest whole number. Use 3.14 for  $\pi$ .



- F** 2512 cm<sup>2</sup>
- G** 3140 cm<sup>2</sup>
- H** 3768 cm<sup>2</sup>
- J** 1256 cm<sup>2</sup>

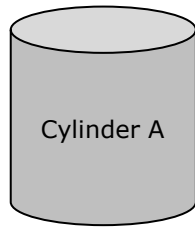
7. If approximately 70% of the Earth is covered with water, what is the approximate area of the total land on Earth? The radius of the Earth is approximately 3959 miles. Round your final answer to the nearest whole number.

\*\*Use 3 for  $\pi$ .

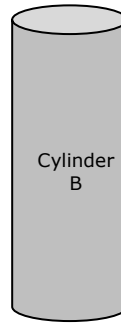


- A** 188,084,172 square miles
- B** 131,658,920 square miles
- C** 626,947,240 square miles
- D** 56,425,252 square miles

8. Which cylinder has the greater lateral surface area?



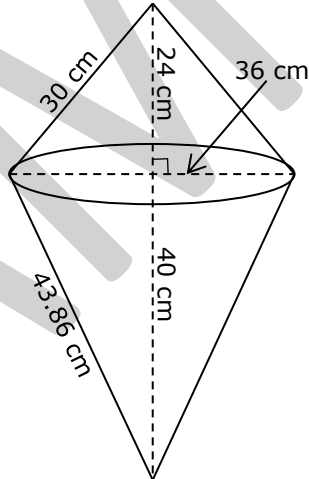
$$C = 11 \text{ in.}$$
$$h = 8.5 \text{ in.}$$



$$C = 8.5 \text{ in.}$$
$$h = 11 \text{ in.}$$

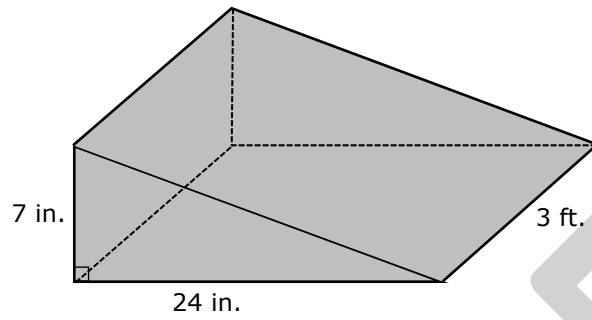
- F** Cylinder A
- G** Cylinder B
- H** The lateral surface areas are equal.
- J** There is not enough information to determine.

9. A three-dimensional kite is made of two cones having the same diameter of 36 centimeters. What is the surface area of the kite? Round your final answer to the nearest tenth. Use 3.14 for  $\pi$ .



- A** 5191.9  $\text{cm}^2$
- B** 4174.6  $\text{cm}^2$
- C** 7226.6  $\text{cm}^2$
- D** 3617.3  $\text{cm}^2$

10. A wheelchair ramp was ordered from a construction vendor. How much material did the vendor use to build this ramp (total surface area)?



- F** 336 in<sup>2</sup>
- G** 264 in<sup>2</sup>
- H** 2100 in<sup>2</sup>
- J** 2184 in<sup>2</sup>