



Table Top Totem Pole Critical Thinking Questions and Answer Sheet

Questions for the table top totem pole activity:

Beginning Level

Describe the shapes you used in your design. Can you find a shape that has exactly 4 sides? How about 5 sides? Did you include any rectangles or triangles?

Look around the room. Can you find objects that have mirror symmetry (one line of symmetry)?

Intermediate Level

If the strip is 9" long and you need to divide it into 3 equal sections lengthwise, how long will each section be? How did you figure it out?

Advanced Level

If the length of the strip is 9" and the width is 3", what is the total area of the strip? How did you figure it out?

If we want our totem pole to be 1' tall, how many 9" x 3" strips will we need? How many for 2' tall? How about 3' tall? Do you notice a pattern? Can you explain the pattern?

Questions for the original totem pole activity:

Beginning Level

Describe the shapes you used in your design. Can you find a shape that has exactly 4 sides? How about 5 sides? Did you include any rectangles or triangles?

Look around the room. Can you find objects that have mirror symmetry (one line of symmetry)?

Intermediate Level

If the poster board strip is 24" long and you need to divide it into 3 equal sections lengthwise, how long will each section be? How did you figure it out?

Advanced Level

If the length of the poster board strip is 24" and the width is 6", what is the total area of the strip? How did you figure it out? (Use the scrap paper, if necessary.)

If we want our totem pole to be 6' tall, how many 24" x 6" strips will we need? How many for 7' tall? How about 8' tall? Do you notice a pattern? Can you explain the pattern?

Challenge! Determine the volume of our totem pole if the pole is 7' tall. (Reminder - the formula for the area of a circle is: $A = \pi r^2$)

Table Top Totem Pole Answer Sheet

Beginning: Students will have a variety of answers depending on the designs they make and what they see in their environment.

Intermediate: $9'' \div 3 = 3''$ sections. Students will have a variety of answers to how they arrived at the answer.

Advanced: The total area of the strip is 27 square inches: $9'' \times 3'' = 27 \text{ in}^2$. Again, students will have a variety of answers as to how they figured it out.

One way to figure out the answer to the second part of the problem is to convert everything into a common unit of measurement - in this case, inches: $1' \div 3''$ becomes $12'' \div 3'' = 4$ strips. Therefore $2' \div 3''$ becomes $24'' \div 3'' = 8$ strips and $3' \div 3''$ becomes $36'' \div 3'' = 12$ strips.

Totem Pole Answer Sheet

Beginning: Students will have a variety of answers depending on the designs they make and what they see in their environment.

Intermediate: $24'' \div 3 = 8''$ sections. Students will have a variety of answers to how they arrived at the answer.

Advanced: The total area of the strip is 144 square inches: $24'' \times 6'' = 144 \text{ in}^2$. Again, students will have a variety of answers as to how they figured it out.

One way to figure out the answer to the second part of the problem is to convert everything into a common unit of measurement - in this case, inches: $6' \div 6''$ becomes $72'' \div 6'' = 12$ strips. Therefore $7' \div 6''$ becomes $84'' \div 6'' = 14$ strips and $8' \div 6''$ becomes $96'' \div 6'' = 16$ strips. As written by a 7th grader: *"Since one foot has two sets of 6 inches in it, you just multiply the number of feet by 2."*

Challenge: One way to determine the diameter is to divide the circumference by 3.14. Since we know that the circumference is 24'', we divide that by 3.14 to get approximately 7.64. We could round this to 7.5'' to make it easier to work with. Half of 7.5'' is 3.75''. This represents the radius. Now it's just a matter of plugging numbers into the formula, $A = \pi r^2$. $A = 3.14 \times 3.75^2$. $A = 3.14 \times (\text{approximately}) 14 = (\text{approximately}) 44 \text{ in}^2$. Now that we know the area of the base of the cylinder, we can multiply it by the height to get the volume: $44 \times 84 = 3,696 \text{ in}^3$.

Note: Some students will use the ruler to determine the diameter and thus the radius. Because it is difficult to be exact this way, answers may vary slightly.