

Learning about Surface Area and Volume

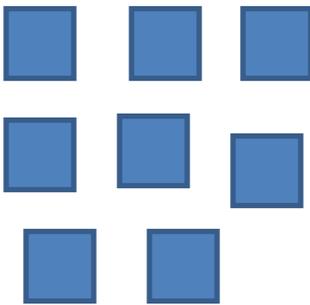


Name _____

Station 1: Explore A:

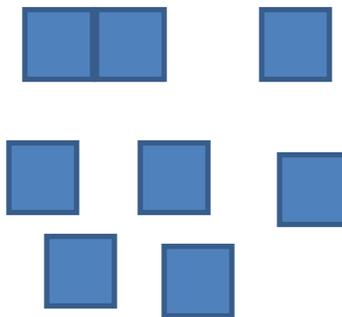
Circle yes or no under the diagram of each table arrangement to tell if it has enough room for 32 chairs.

Arrangement 1



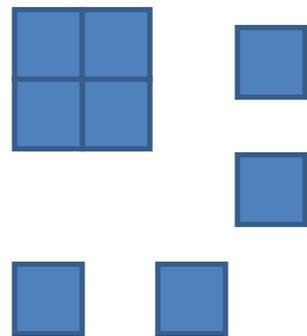
Yes or No

Arrangement 2



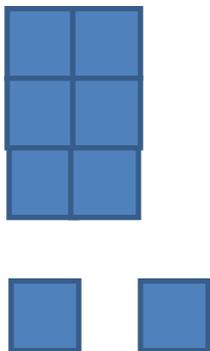
Yes or No

Arrangement 3



Yes or No

Arrangement 4



Yes or No

Arrangement 5



Yes or No



Station 2: Explain A

Area is the inside space of a shape or boundary. To find the area of a square or rectangle use the formula $\text{Area} = \text{base} \times \text{height}$
Perimeter is the total lengths of all sides of a shape. To find the perimeter use the formula $\text{Perimeter} = \text{side 1 length} + \text{side 2 length} + \dots\dots\dots$

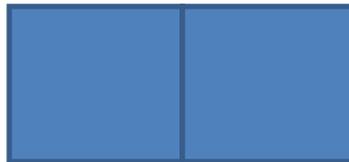
Directions

1. Using your ruler measure the table arrangements below and write down the area and perimeter of each.



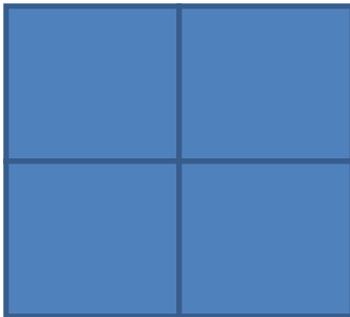
Area = _____

Perimeter = _____



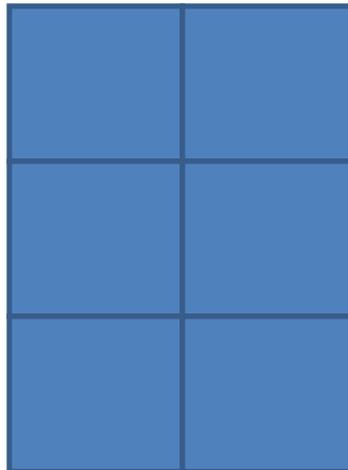
Area = _____

Perimeter = _____



Area = _____

Perimeter = _____



Area = _____

Perimeter = _____



Station 3: Elaborate A

Directions: Look at the table arrangement below:

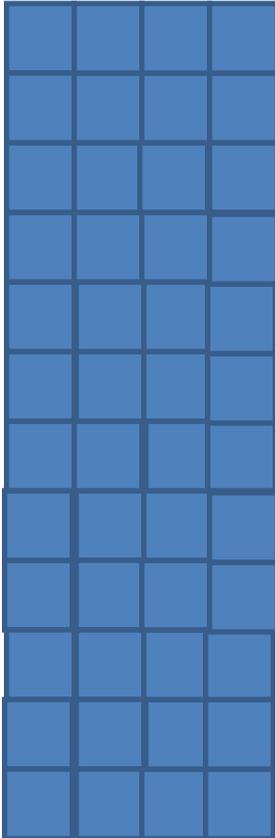
1. Circle yes or no if it would have been able to seat all 32 people.

Yes No

2. Determine the area and perimeter of this table arrangement.

Area _____

Perimeter _____



3. Using your table squares find a single table arrangement that would seat 38 people.
4. Sketch the table arrangement below, then determine the area and perimeter.

Area _____

Perimeter _____



Station 4: Explore (B)

Essential Question: Would a big meatball or several smaller meatballs use up the most spaghetti sauce?

Directions:

1. Look at the two cups of colored sugar. Make a mark on the outside of the container to show how much sugar is in the container.
2. Open one container of sugar and pour the sugar in the paper plate. Taking one of the play dough balls roll it around the plate coating the outside with sugar. Stop rolling it around when it appears no more sugar is sticking to outside.
3. Pour the left over sugar back into the container it came from and mark on the outside the level of the sugar.
4. Taking the other Play Dough® ball, divide it into three smaller balls.
5. Pour the sugar from the other cup onto a paper plate. Roll the three smaller balls around on the plate until sugar stops sticking.
6. Pour the left over sugar back into the container it came from and mark on the outside the level of the sugar.
7. Looking at the two sugar containers, which size Play Dough® ball(s) has the least amount of sugar left? Was it the container from the big play dough ball or the smaller play dough balls?
8. Why do you think one had less sugar than the other?



Station 5: Explain (B)

Volume is the measure of the amount of space inside of a solid figure, like a cube, ball, cylinder or pyramid.

Formula for the volume of a cube: volume of cube = length x width x height

$$V_{\text{cube}} = l \times w \times h$$

Surface area is the total area of the outside surface of an object.

Formula for the surface area of a cube: Surface Area = length x width x 6 sides

$$SA = l \times w \times 6$$

Directions:

1. Using the Play Dough® cube you have been given, determine the volume and surface area.

Volume = _____ Surface Area = _____

2. Would you have the same total volume and surface area if you were to cut the cube into four smaller cubes? Yes or No Explain your answer _____

3. Using the knife, cut your cube into four smaller cubes.

4. Determine the volume of each smaller cube and then add up all the volumes to get the total volume.

Volume of Cube 1 = _____ Volume of cube 2 = _____ Volume of cube 3 = _____

Volume of cube 4 = _____ Total volume = _____

5. Determine the surface area of each small cube and then the total surface area by adding up the SA of each of the smaller cubes.

SA of cube 1 = _____ SA of cube 2 = _____ SA of cube 3 = _____

SA of cube 4 = _____ Total SA = _____

6. Did the volume and surface area of the smaller cubes the same as what you had for the larger cube? Yes or no

7. If they stayed the same, why do you think that happened? _____

If they changed, why do you think that happened? _____



Station 6: Elaborate (B)

The smaller something is the more surface area it has.

Essential Question: What should Mr. Comfort do to the meatballs to have more sauce used up?

Directions:

1. You have been given three Play Dough[®] meatballs, plate, knife and sauce (colored sugar).
Figure out the best size for the meatballs so that they use up the most sauce (sugar).
2. Write below how many meat balls you decided on and why.