

Tessellations Activity Teacher Notes and Answers

1. Supplies Needed: a ream of paper, a roll of tape per group or two, blocks or weights to hold down paper.
2. Before class fold a piece of computer paper into a triangle-shaped tube and tape it shut.
3. Repeat with a square tube, hexagonal tube, and octagonal tube.
4. Here are some videos which you could show just before beginning:
 - Tessellations in Nature (1:40 min)
<https://www.youtube.com/watch?v=KGQYLzFujM>
 - Tessellations: Examples (Basic Geometry Concepts) (4:32 min)
https://www.youtube.com/watch?v=LrS4GO_2d8g
 - Tessellations: Real Life Examples (1:02 min)
<https://www.youtube.com/watch?v=5uC22PTblbg>
5. Student answers will vary depending on their testing outcomes. The answer to question 4 should be something like, “If we want a stronger product, we need to use the _____ (the strongest shape).”

Tessellations Activity

A tessellation is a pattern of identical shapes that fit together without gaps or overlapping. A honeycomb is a tessellation. Tessellations are shapes that affect strength and design.

Procedure

1. Obtain a blank piece of paper. Fold it into a triangle-shaped “tube” and tape it shut.
 - a. You can fold the piece of paper into thirds along its horizontal axis, forming the three side of a triangle. Then connect the ends of the paper forming one of the vertices; the other vertices are made up of your two previous folds. You can make hexagons using the same method, only this time fold the paper into sixths, and so on.
 - b. Remember, for the purposes of this activity a tessellation needs an even number of sides; test out your students’ knowledge by trying to get them to make a tessellation out of pentagons!
2. Put the tube on the table so that it is perpendicular with the surface of the table.
3. Place a weight on top of the tube. Slowly add weights until the tube collapses.
4. Record the number of blocks.
5. Place collapsed tube in the recycle bin.
6. Fold three more triangle tubes and tessellate them. Use a few pieces of tape to tape them together.
7. Place a block on top of the tube. Slowly add blocks until the tube collapses.
8. Record the number of blocks.
9. Place collapsed tube in the recycle bin.
10. Repeat the process by folding square tubes, hexagonal tubes, and octagonal tubes recoding the number of blocks it takes to collapse a single tube and tessellated tubes.

Data

| Tube Shape | Number of Weights |
|-----------------------------|-------------------|
| Triangle – Single Tube | |
| Triangle – Tessellated Tube | |
| Square – Single Tube | |
| Square – Tessellated Tube | |
| Hexagon – Single Tube | |
| Hexagon – Tessellated Tube | |
| Octagon – Single Tube | |
| Octagon – Tessellated Tube | |

Questions.

1. What was stronger—single tubes or tessellated tubes? _____
2. Which single tube shape was the strongest? _____
3. Which tessellated tube shape was the strongest? _____
4. How can you use this knowledge when designing a product? _____