Strong Shapes	Kindergarten Physics

Lesson Plan

Safety Notes: Make sure you have someone to help you balance!

Description

In this lesson your students will learn about weight distribution and how small fragile objects can be used to hold a lot of weight. They may learn a little balance in the mix as well! It is a fun and easy way to engage students and to allow them to safely experiment on their own.

Materials

- Flat piece of cardboard (big enough to stand on)
- 12 paper cups

Science Background

Balancing a large object on a surface is difficult and many factors are involved. Some questions to consider when balancing an object are:

- Which object is heavier?
- Will the object on the top be affected by gravity?
- Is the bottom object still or could it move?
- Is there enough space for the object to balance on?
- Could the wind affect the balance?

If you are trying to balance an elephant on a beach ball that is very difficult but not impossible. That is because of what is called *weight distribution*. The same can be said about laying on a bed of nails. If you lay on one nail it would puncture your skin but we know you can lay on 1,000 nails and you would be just fine. You can do this because your weight is distributed evenly.

Activity Procedure

1. Before you start the activity, think about how much you weigh. How many cups do you think it will take to hold your body weight? Let's see if you are right!
2. Place two paper cups on the floor, a hand width apart, with the top (drinking end) on the ground. With the help of an adult, try to stand on the two paper cups. What happened?
3. Next, place 4 cups close together on the floor with a piece of cardboard resting on top. Try standing on the piece of cardboard on the cups. Did you get a different result than when you tried it with 2 cups or did you get the same result?
4. For the last try, do the same thing but with 6 cups! What happened this time?

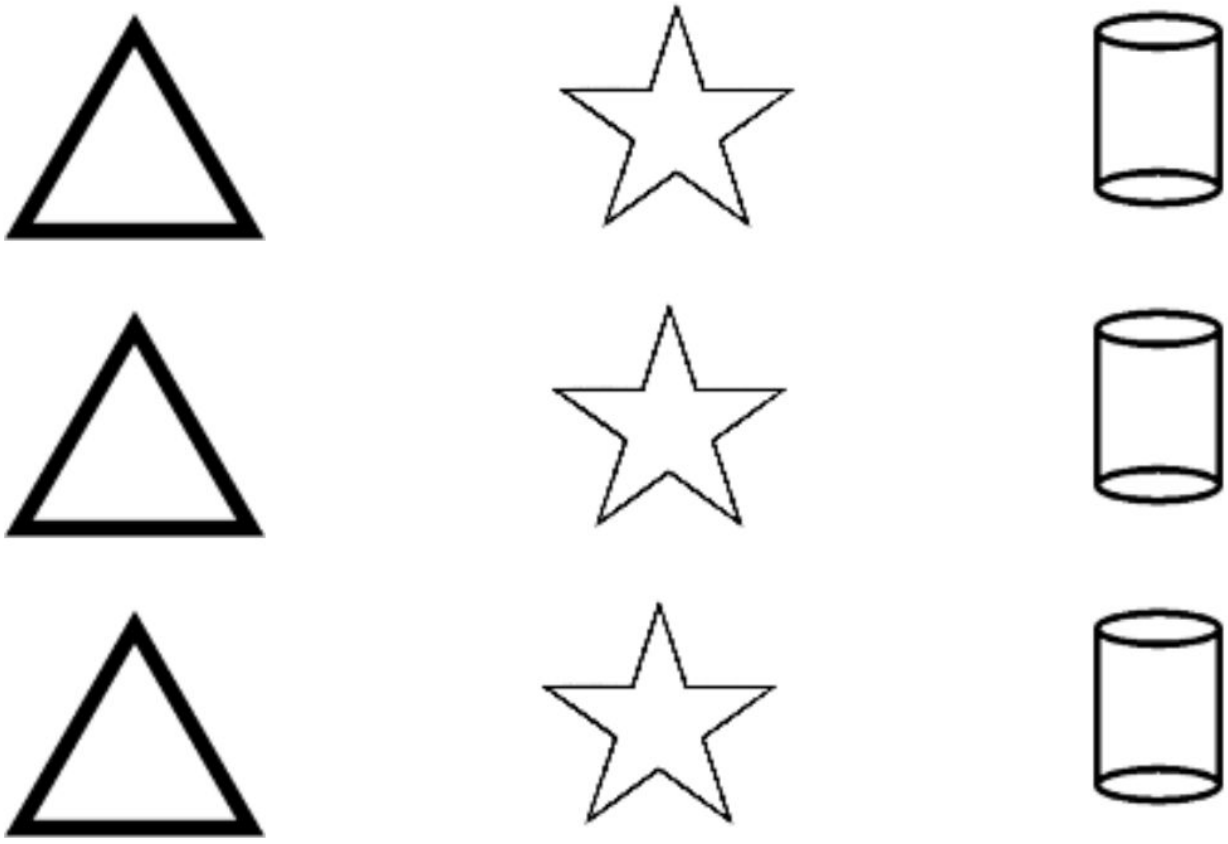
Debrief

You can try this experiment with other objects around your house. Try some similar sized Tupperware. Do you think they would need to be round or square Tupperware?

You can also try to see how much weight you can place on bubble-wrap before it pops! Would it work better to have the bubble wrap folded or flat?

Handout

Can you tell me which shape would make the strongest tower stacked one on top of the other? Circle the shape you think would make the best tower.

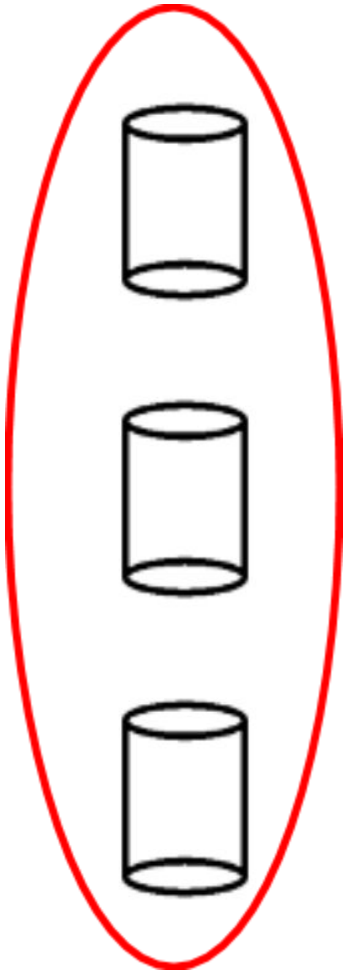


Handout Answers

Can you tell me which shape would make the strongest tower stacked one on top of the other? Circle the shape you think would make the best tower.

The triangles would be very tippy. The pointy top doesn't have enough room for the flat bottom to rest on.

The stars are a little better, but would still be easy to tip over. The pointy bottoms don't have a lot of space to rest on either.



The cylinder would make the best tower out of these shapes. The flat bottom and the flat top have a lot of space to rest on.