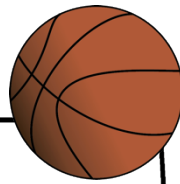


STEM Challenge: Basketball Tower {Notes to Teacher}



Materials:

- newspaper
- masking tape
- basketball

Time Requirements:

- Building:** 25 minutes
- Testing:** 10 minutes
- Repeat if possible!**

Groups: 2-3 students

Science Background:

A basketball is pretty heavy relative to newspaper. In order for newspaper to support the weight of the basketball, the tower needs to be able to withstand the force of gravity that pulls the basketball down. Students will need to build a tower that is strong enough to not buckle under this weight.

To do so, students will need to find ways to make the newspaper stronger than it is. You can do this by rolling it into columns, folding it accordion style, crumpling it into a wad. Encourage students to find different ways to use the paper to create supports for the tower.

A basketball is quite large, so it will be important that students balance the weight by distributing it or spreading it out over a wider surface. They can do this by creating a larger base. Think about the base of the Eiffel tower.

For an Extra Challenge:

- For students who require an extra challenge, you can limit the amount of tape or newspaper used or create stricter time constraints.
- Try to create the tallest tower possible.

Tips and Suggestions:

- Grab LOTS of newspaper, or have students bring it in.
- It's easiest if you have a roll of masking tape for each student, but you can also have a few rolls that you walk around and dispense. You could also just tear 10-20 strips off for each group.

Procedure:

1. Catch students attention by bouncing a basketball.
2. Show a stack of newspaper. Ask students if they think newspaper could hold a basketball.
3. Pass out the challenge organizer (with or without guiding questions, depending on your needs).
4. Explain that they will be constructing a tower that will hold a basketball. They can use only newspaper and masking tape.
5. Guide students through the "Ask," "Imagine," and "Plan" sections. The boxes are designed to guide thinking and discussions and jot notes.
6. Give students time to create. I recommend 25 minutes, but you can do more or less based on your available time. I do recommend setting time constraints. Otherwise, students will go on forever ;) The first time you do a STEM project, it will be harder to fit in the constraints, but as your students get accustomed to the process, they will learn that they have to work efficiently and together to complete the project in the allotted time.
7. When completed, have students measure the height of their towers.
8. To test, place a basketball on the tower, and measure the time. You could test all of the towers together with everyone watching. To save time, I would often travel around and just help students test as they finished building.
9. If you have time allow students to improve and rebuild. This can be completed on the same day or the next day. Although it is time consuming, there is so much students can learn from creating a better design.



Improve

Try to improve your tower. What can you do to make it taller or stronger?

If you have time, try it and test again!



Test

Measure:

Tower Height

Test: Place the basketball on the tower. Does the tower support the ball for at least 20 seconds?

Circle: yes / no

Name _____



Basketball Tower



Ask

Think about the shapes of various towers you have seen. What makes them stand? What makes them strong?

What are some different ways you can manipulate and fold the newspaper to build with it?



Imagine & Plan

Tinker around with the newspaper. What are some ways you could shape it to construct a tall and strong tower?

With your group, come up with a plan.

Challenge:

Design a tower that can support a basketball.

Success Criteria:

*Your tower should support a basketball for at least 20 seconds.

Constraints:

*You may only use newspaper and masking tape.

Bonus Challenge:

*Construct the tallest tower possible!

*Time allowed _____



Create

Work together to create a newspaper tower that will support the basketball.



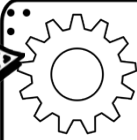


Improve

Name _____



Basketball Tower



Ask

Challenge:

Design a tower that can support a basketball.

Success Criteria:

*Your tower should support a basketball for at least 20 seconds.

Constraints:

*You may only use newspaper and masking tape.

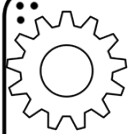
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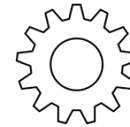
*Time allowed _____



Test



Imagine & Plan



Create

