



Grade Level:

All

Activity Time:

15 minutes

Preparation Time:

None

The Challenge: Imagine you are a structural engineer and you must design and build the strongest bridge using only straws, tape, and paper clips.

Materials:

- 25 straws
- 5" of tape
- 15 paper clips
- Small weights

Directions:

Introduction:

1. Introduce the challenge to your child. Imagine you are a structural engineer and must design and build the strongest bridge using the available resources. The goal of this activity is to build a bridge that can hold the most weights before breaking.
2. Have a discussion about how and why bridges are built the way they are. Show pictures of real bridges or have your child recall how different bridges they have seen look like.

Brainstorm and Design

3. Give your child their materials.
4. Brainstorm with your child possible designs for their bridge using the available materials.
5. Have your child sketch out their design on a sheet of paper. As they are working, ask them open ended questions about their design.

Build:

6. Give your child about 15 minutes to construct their bridge. As they are building, ask open-ended questions about the design.

Test:

7. After your child has finished building their bridge, test the strength of the bridge by placing one weight at a time until the bridge collapses.

Reflection and Discussion:

8. Follow up the activity with a discussion using the following questions.

Activity - Straw Bridges

- *What things worked well about your bridge? Why? What are things you could improve on your bridge?*
- *What steps would you take to design and build a bridge using Popsicle sticks?*

Redesign:

9. If time permits, allow your child to go back and redesign their bridge. Emphasize learning from testing and using ideas other from other bridges.
10. After your child has finished redesigning their bridge, test the bridge again. Make sure to highlight the improvements the second time around.
11. Lead a discussion on the engineering design process and explain that the design challenge they just completed is an example of utilizing this process to solve a problem.

