

Title

Polly

Crash Pads

Activity Overview

Description:

Campers will create a crash pad capable of cushioning a water balloon's fall.

Topic Area(s) : Physics, Forces

Grade Level: 1-4

Duration: 45 minutes

Learning Outcomes:

- To understand matter and energy, everything that happens is a result of using some form of energy.
- Understanding structures and mechanisms. Movement is the change in position of an object.
- Learn about forces (push and pull).

Hook

Have you ever thought of how airbags save lives?! We are going to make crash pads that will save our water balloons from breaking, just like an airbag! Firefighters also sometimes use crash pads to save people from burning buildings!

Background Information

Force: A force is a push or a pull. There are a lot of different types of forces, for example: friction, tension, normal forces, electromagnetic, etc. In this activity the major force that we will want to reduce is the pushing force the balloon exerts on the crash pad. Minimizing this pushing force will reduce the chance that the water balloon will pop. The balloon is also pulled to the ground by the force of gravity.

Energy: Energy is defined as the ability to do work. In the case of this activity, and this age group it can be explained as; everything that happens is a result of using some form of energy. In this case the reason that the balloon pops is because the force of gravity causes the water balloon to gain energy as it's falling. When it hits the crash pad it has a lot of energy. To reduce the chances of it falling the crash pad can absorb some of the energy and prevent the impact from being so big that the water balloon pops.

Materials

Per group (of 2-4 kids):

- Masking Tape (2 m)
- Cardboard (2 sq. ft)
- Popsicle Sticks (10)
- Cotton Balls (10)
- Balloons filled with air (2)
- Sponge (1)
- Newspaper (2 sheets)
- Straws (10)
- Scissors
- Water Balloons (1/group)

Additionally: Garbage bags and a mop/bucket if you are doing this inside

Safety Considerations

Do not cut yourself with scissors. Do not throw water balloons at each other!

Procedure

1. Divide the campers into groups of 2 or 3, and hand out the materials except for the water balloons.
2. Let the groups see the air balloons to see if their crash pad is big enough for the balloons in general.
3. Let the campers design and build their crash pads using the materials provided. Encourage creativity and critical thinking!
4. Bring the campers outside to a predetermined space or to a location where the floor can get wet. Test each crash pad individually and let the campers watch each group to see what works and what doesn't work. Let the campers explain their crash pad before testing.
5. Take the campers back inside and discuss what features worked and what didn't and discuss why.

Wrap-Up/Debrief

- Talk about the different properties of different materials and designs. (Why they chose what materials, how to chose their design, etc.)
- Remind them: energy is defined as the ability to do work. In the case of this activity, and this age group it can be explained as; everything that happens is a result of using some form of energy.

Additional Resources

None.