



DUKE ENERGY SCIENCE NIGHT

Parachutes

Big idea

Explore properties of gravity and drag by designing and building a parachute with a few simple household materials.

You will need

WHAT WE GAVE YOU:

- napkins
- paper clips
- string
- masking tape
- small sticky note pads
- Parachutes instruction sheet

STUFF YOU PROVIDE:

- scissors
- markers

Set it up

Use masking tape to create a bullseye target on the floor. Start with the center ring about the size of a paper plate and move outward in concentric rings. Make each new ring a foot or so larger than the previous. The target should consist of 3 or 4 rings. You may choose to provide additional targets depending on space available.

Lay out the materials in order from left to right: string, rulers, scissors, napkins, stickers, paper clips. Place the Parachutes instruction sheet on the table. It's a good idea to make your own parachute beforehand. This way the students can see the finished product, and you get a chance to make sure you understand the instructions as well as anticipate any issues children may face when constructing and testing their parachutes.

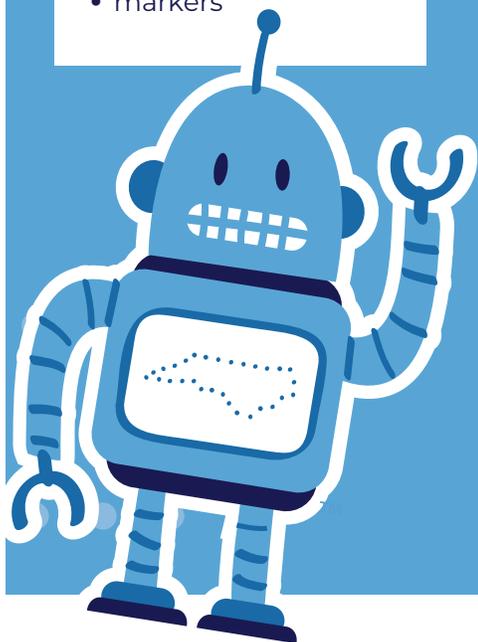
It's showtime!

Show families how your example parachute works. Help families make a parachute according to the instructions. Challenge them to drop it so that their passenger, a paper clip, lands as close to the center of the target as possible. To help track where parachutes land, ask each participant to put their name or initials on a small sticky note – each time they drop their parachute they can place the sticky note where their paper clip landed. Encourage them to explore different variables when testing and building their parachutes. For example: the height from which it is dropped, where they are standing when they drop their parachute, the angle at which it is released, the length of the strings, etc.

If they love it?

After participants have successfully built one parachute, challenge them to change the design (one element at a time!) to see how it impacts the descent of their parachute.

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Parachutes

Fun options

AHEAD OF TIME

If you want, you can provide additional materials like coffee filters, newspaper, tissue paper, etc. Small plastic animals make fun parachute passengers while providing a little extra challenge to the parachute design.

DURING SCIENCE NIGHT

If you have an additional volunteer, you can add a ladder to the activity to make the parachute launches more dramatic. The volunteer can “spot” children while on the ladder to ensure safety.

Why is this science?

When you throw something into the air, like your parachute, it falls because the force of **gravity** pulls it to the ground. As something falls or moves through the air it experiences another force called **drag**, which is caused by the air pushing back against that object. Have you ever put your hand outside a car window as it was moving? The air rushing past the car pushes your hand backwards. Drag slows the object down and the more drag, the slower the object will move. As a parachute falls, the part that fills with air is called the canopy. A parachute works because air gets trapped in the canopy, increasing the force of drag on the parachute and slowing its descent to the earth. Successful parachutes will increase drag enough to allow the object to land safely.

North Carolina connection

A North Carolina native, Georgia Ann Thompson, made history for her role in parachuting and is known as “The First Lady of Parachuting.” At the age of fifteen she attended a carnival in Raleigh and watched Charles Broadwick jump from a hot air balloon with a parachute. She joined his traveling show, the World Famous Aeronauts, and parachuted from hot air balloons at fairs, carnivals, and parks around the country.

In 1913, she became the first woman to jump from an airplane with a parachute. The following year, she demonstrated the technology to Army officials but the line of her parachute became tangled in the tail of the plane. She cut off the line and opened her chute manually, paving the way for ripcord technology that is used today. Throughout World War I, she worked as an advisor for the U.S. Army Air Corps, now known as the U.S. Air Force. She retired from parachuting in 1922 after more than 1,100 jumps! You can still see her parachutes on display at the North Carolina Museum of History in Raleigh.



PROUDLY PRODUCED BY



Parachutes

Supplies:

- 1 napkin
- 1 paper clip
- 4 pieces of string
- 4-5 pieces of masking tape
- 1 sticky note

What to do

1. Cut four equal length pieces of string, each approximately 12 inches long.
2. Unfold a paper napkin so that it is laying flat.
3. Use a piece of masking tape to secure one piece of string at each corner of the napkin.
4. Bring the loose ends of the strings together and thread them through one end of a paperclip.
5. Fold the loose ends of the string up to form a loop (the paperclip should hang down from the loop).
6. Tie a knot or wrap a piece of masking tape around the loose strings to secure the loop and the paperclip.

Test your parachute

- Hold your parachute up so that the strings and paperclip hang down, then drop.
- Mark your spot with your sticky note.
- Are there any changes you could make to your parachute to make it land more accurately?

