

WORKSHOP EXTENSION ACTIVITY

Built by The Home Depot Kids Workshop

March 2022: Airship

Ages 5-12

CONNECT.

Where have you seen parachutes before? Do you know what they are used for?

Some parachutes are used for sports, like skydiving or parasailing. Other parachutes are used in the military to drop supplies, equipment, or even soldiers safely to the ground. Large parachutes can be used to protect small planes from engine failure or running out of gas. And it is not just on Earth that parachutes can be found! They are also used frequently by spacecrafts during descent and landing.

INVESTIGATE.

Imagine that your Airship will have a passenger on board, and that passenger needs to be able to evacuate quickly. Your airship therefore needs a parachute!

It is now up to you to investigate: how exactly does a parachute work? And, how can you construct a parachute that works as effectively as possible?

You'll need:

- Heavy duty trash bag
- Coffee filters
- String
- Scissors
- Tape
- Any other household material that you think may come in handy
- Notepad
- Stopwatch

1. Look around your home for a small doll, action figure, or stuffed animal that you can use as your test passenger. (A small ball or any lightweight, non-breakable toy will work well too!)
2. Then, consider: When someone falls, gravity pulls them down. As they fall through the air, there is also a little bit of air resistance pushing back up at them... but not a lot! The force of gravity pulling them down is much stronger than the air resistance pushing in the opposite direction. However, this changes if a parachute opens during their fall. With the help of a parachute, air resistance increases and the speed at which the person falls decreases.
3. Your challenge is to use your materials to create a parachute that will take your passenger to the ground as slowly as possible. Experiment with the materials you have available and try to create at least three different parachute models that you can attach to your test passenger.
4. Find a location in or around your home where you can test your parachute designs. The top of your stairs, off the side of your deck, or even from the arms of an adult who is standing on a chair could all work!

5. Test each parachute at least three times. For each trial:

- Attach your test passenger to the parachute
- Drop your test passenger and parachute from the same height
- Use the stopwatch to time how long it takes your test passenger to reach the ground
- Record these times on your notepad
- Average the drop times for each parachute so you can compare the trials

6. Then, take the parachute that helped your passenger fall the most slowly and analyze why it worked better than the others. Is there anything else you could change to make it perform even better? Select at least one way you could improve your design and then optimize your parachute by making these changes!

INNOVATE.

You will need:

- Your Airship
- Your optimized parachute
- Velcro
- String
- Super glue
- Tape
- Rubber bands

Now, determine how to best attach your parachute to your Airship. As you experiment with the Airship, your parachute, and the attachment materials, keep the following guidelines in mind:

- Your parachute must be folded, packaged, or otherwise stored aboard the Airship in a way that won't affect how the Airship flies.
- While the parachute needs to be secure as the Airship soars through the sky, it also needs to be detachable at a moment's notice so your passenger can evacuate quickly.



Monitoring air flow and ventilation (fresh air) is an important skill for workers in trade careers, like **HVAC technicians**. **HVAC technicians** are the people who help make sure your home's heating and air conditioning systems are working properly. They do their best to keep you cool in summer and warm in winter!

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