Science at Home (https://www.msichicago.org/science-at-home/)

Keep learning in place and at your pace with science activities and topics you can access anytime.

- **Subscribe to Science at Home (https://www.msichicago.org/science-at-home/subscribe/)**

ENGINEERING

Egg Drop Challenge

Get your payload safely to the surface! Design and build a lander that protects a raw egg that's dropped from up high.

Materials

- Raw egg, or other payload that needs protecting
- Container, like a cardboard tube, cup, box, etc.
- External protection materials, like balloons, rubber bands, craft sticks, straws, etc.
- Internal padding, like fabric, packing materials, paper, etc.

- Pen or pencil
- Paper
- Tape
- Scissors

Directions

Design a landing craft that protects your egg passenger when it's dropped from up high. Use the engineering design cycle for this experiment: design your landing craft, test it to see if it works, change your design to make it better, and re-test to get new results.

1. Collect your materials. You'll need a container, some internal padding and external protection to safely land your craft. There's no "right" set of materials, so be creative and try lots of things to see what works best!
2. Draw your design ideas on paper. What does your lander look like? What materials will you use? Try using just one container, one type of internal padding and one type of external padding at first.

3 Build your landing device and put your egg inside. Test it out by dropping your device from up high. If the egg doesn't crack, your design is a success! If the egg cracks, make changes to your design and re-test it.

What's happening?

Gravity is a force of attraction — it pulls on a mass, which is how much "stuff" something is made of. Earth's gravity pulls on you and keeps you on the ground; it also holds the atmosphere and the moon in place. When you drop your landing craft, gravity pulls it to the ground.

The internal padding that surrounds your egg cushions the payload inside the container, like airbags in a car that protect passengers in an accident. The external protection on the outside of the container protects the egg by absorbing the impact felt when the landing craft hits the ground.

Tips

For a little less mess, use a hard-boiled egg (you'll still see the cracks). You can also cover the landing surface with a garbage bag, or put the raw egg in a sealed plastic bag before putting it in the landing craft.

Extensions

Once you're successful, try dropping the egg from a higher height or increasing your payload to two eggs. Try landing your craft on different types of surfaces like grass, pavement or water. How does the surface affect your landing? How might this change your vehicle design?

Have a friendly competition: who can get their egg to the surface the fastest? The slowest? From the farthest distance? With the fewest bounces?

Recommended reading

Aerospace Engineering and the Principles of Flight by Anne Rooney

Rosie Revere, Engineer by Andrea Beaty

Museum Store (https://www.msichicago.org/visit/shops-and-restaurants/shop-msi/)

Explore

What's Here (https://www.msichicago.org/explore/whats-here/)

Education (https://www.msichicago.org/education/)

Experiment (https://www.msichicago.org/science-at-home/)

About Us (https://www.msichicago.org/explore/about-us/)

Careers (https://www.msichicago.org/explore/about-us/careers/)

Press (https://www.msichicago.org/press/)

Location + Hours

5700 S. DuSable
Lake Shore Drive
Chicago, IL (Illinois) 60637

Open today
from **9:30** a.m. to **4:00** p.m. (https://www.msichicago.org/visit/museum-hours/)

Getting Here (https://www.msichicago.org/visit/getting-here/)

Privacy Policy (https://www.msichicago.org/privacy-policy/)

Terms of Use (https://www.msichicago.org/terms-of-use/) Contact us (https://www.msichicago.org/contact/)

Select Language