# Design a Conservation Team Supply Parachute

**Engage and Reflect**
Watch *Virtual Vitamin Z - Zoo Educational Lesson: Penguin Design Challenge*
https://www.youtube.com/watch?v=7PGR-th4U5Q

**Skills**
- Problem Solving
- Engineering
- Push/pull forces

**NGSS Science and Engineering Practices**
- Developing and using models
- Planning and carrying out investigations

**Experience**
- Time varies
- 1 or more people

The Detroit Zoological Society (DZS) supports conservation work in the Falkland Islands by studying the health of the gentoo and rockhopper penguins that live there. The islands are not easy to gain access to, many have steep rock climbs to gain access to where the penguins live. For this design challenge, we need to construct a parachute that will help the DZS conservation team drop their supplies back on the boat, ensuring they make it down safely without having to carry them as they climb down.

***Celebrating and Saving Wildlife***
By studying species in their native habitats, the DZS is learning how human actions impact these species and how we can work together to protect them. By supporting the DZS, you are helping us conduct this important work!

**Take Action**
Many of our daily activities require natural resources like fossil fuels to be mined from the Earth, including areas around the Falkland Islands where penguins live. By carpooling and taking public transportation whenever possible, we can reduce the amount of natural resources we need to extract from the earth. This helps protect wildlife in their native habitats. If you encourage friends and family to do the same, we will make an even bigger impact!

DETROIT ZOOLOGICAL SOCIETY®
DETROIT ZOO ◆ BELLE ISLE NATURE CENTER

# Design a Conservation Team Supply Parachute

## Tools

Found materials from around your home
4 quarters (taped together) or a metal teaspoon
Tape measure
Stopwatch (many phones have built-in stopwatches)

*1 or more people*

## Directions

### How long does it take?

- Mark a height of 4’ on a wall or other flat, vertical surface.
- Holding your quarters or teaspoon at the 4’ mark, time how long it takes for the object to hit the ground.
- Try this at least three times, timing each trial.
- Average your trials, so if you have three trials, add all the trials together, then divide by the number of trials, for this example, three.
- Record your data.

### Slow it down

- Decide which materials you will use to make a parachute to slow down the drop rate.
- Attach your parachute to your quarters or teaspoon.
- Holding your quarters or teaspoon at the 4’ mark, time how long it takes for the object to hit the ground.
- Try this at least three times, timing each trial.
- The goal is to increase the amount of time it takes for the object to reach the ground when it’s dropped from a height of 4’.

Notes - This activity can be scaled up. For older students, find a variety of objects that can be dropped, do they all take the same amount of time to hit the ground when dropped from the same height? How long does it take eight quarters taped together to fall from a height of 4’? How about 12 quarters? You could also limit the materials available to use in the design or the amount of time to create different designs.

To see some designs that have been created, watch this short video:
https://www.youtube.com/watch?v=LY6ujwXU2B8

DETROIT ZOOLOGICAL SOCIETY
DETROIT ZOO • BELLE ISLE NATURE CENTER

# Parachute Data Sheet

| | Time in seconds | Notes |
|---|---|---|
| Object drop without parachute - drop from a height of four feet. | | |
| Trial 1 | | |
| Trial 2 | | |
| Trial 3 | | |
| Average<br>(Trial 1 + Trial 2 + Trial 3) / 3 = | | |
| Object drop with first parachute design - drop from a height of four feet. | | |
| Trial 1 | | |
| Trial 2 | | |
| Trial 3 | | |
| Average<br>(Trial 1 + Trial 2 + Trial 3) / 3 = | | |
| Object drop with second parachute design - drop from a height of four feet. | | |
| Trial 1 | | |
| Trial 2 | | |
| Trial 3 | | |
| Average<br>(Trial 1 + Trial 2 + Trial 3) / 3 = | | |