

What is Microgravity?

Introduction

Parabolic flight is a unique flight pattern that creates a microgravity experience. This lesson will introduce the concept of microgravity and what a person can experience on a parabolic flight.

Target grade level all grades

Suggested time frame one 45 minute lesson



Standards NGSS

MS-PS2-4: Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.

HS-PS2-4: Use mathematical representations to support a claim regarding relationships among the gravitational force between two objects, the masses of the objects, and the distance between them.

MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

HS-ETS1-2: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

Objectives To define microgravity and what causes microgravity.

Materials

Video of “Upside Down” by OK Go

Camera

Green screen

Engage

1. Watch the music video [Upside Down, Inside Out](#) by OK Go.
2. Lead a discussion on what the students see. Older students can hypothesize on how they think the video was filmed.

Discussion

- What is happening in this video?
- Based on what you see, what do you think microgravity is?
- What do you think caused the microgravity in this video?
- How does gravity affect people? How do people and objects move differently in microgravity?
- What motion do you think the plane is making in the video? Hint: think about rollercoasters or being in a car going over a big hill!
- Why do you think the musicians recorded their music video in this manner?

Explore- Create a Zero-G photo shoot!

1. Set up a green screen (green butcher paper can also be used!)
2. Pose as if YOU or you and your friends were on G-Force One!
3. Use photo or video editing software to add a G-Force One, ISS, or deep space background behind you.

Assessment

Students share understanding of microgravity through classroom discussion and participation.

Extension

Older students should discuss the physics behind a parabolic shape and how the flight makes

**Create your own
choreographed music video on
G-Force One!**

Using Newton's Laws as a guide, describe
how reduced or microgravity affects motion

Resources

Video: [Making Inside Out by OK Go](#)

Article: How aircraft are used in Zero-G
<https://simpleflying.com/aircraft-zero-gravity-fimling/>