

# Forces and Motion

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## Forces and Motion with Stop Motion Technique

Suggested time: 80 minutes

### Overview

Students will continue learning about Force and Motion they will need to create an advertisement for a product using force and motion and recording with the Stop Motion technique.

### Vocabulary

- Force
- Push
- Pull
- Motion
- Gravity
- Speed
- Weight
- Mass
- Advertisement
- Stop Motion
- Balanced and Unbalanced Forces
- Magnetic and Electrical Interactions

### Objectives

- Define the Stop Motion technique and its history.
- Complete the planning form to promote a product based on the concepts of Force and Movement.
- Explore the interface of the Stop Motion application for iPads.

## Standards

### NGSS

3-PS2-1 : Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

3-PS2-2 : Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

3-PS2-3 : Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

### ISTE Standards

1d: Students understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

3a: Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

4a: Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

## Project Materials

- iPad or tablet
- Legos
- Colors
- Clay
- Paper
- Construction paper
- Glue
- Scissors
- Markers
- Cardboard

## Multimedia Resources

- *The LEGO Animation Book: Make Your Own LEGO Movies!* , David Pickett. amazon.com
- Force and Motion Video by turtle diary. <https://www.youtube.com/watch?v=rfeV1NL7d9U>
- A Day at the Park - Construction Paper Stop Motion by Christine Ellis. [youtube.com/watch?v=bDKpwmWI8X4](https://www.youtube.com/watch?v=bDKpwmWI8X4)

## The Lesson

### Part 1 - Stop Motion Technique (10 min)

1. Welcome students enthusiastically. Explain that the next classes will be working on a project that they will like.
2. Without telling them anything about the subject, show the video *A Day at the Park - Construction Paper Stop Motion by Christine Ellis*. When the video ends, ask The students if anyone knows what animation technique was used. Have a short discussion on the topic.
3. Continue to discuss the following topics: What is Stop Motion? , History of how it arose and examples from home and movie films.

### Part 2 - The Challenge (5 min)

1. Students will work on a project using Stop Motion, an application for iPads. The challenge: Make an advertisement for a product you use force and movement using the StopMotion technique. The video should length from 30 seconds to 1 minute. Your ad must have Sound, images, objects, and text.
2. Students will work in groups. Must follow the Engineer Design Process.
3. Ask students if they have any questions or didn't understand something.

### Part 3 - Storyboard (20 min)

1. Student research on some advertisements using stop motion techniques like Target or Coca Cola.
2. Ask students to write down their ideas as a team and on a blank paper. It is important that you highlight the concepts of Force, Movement, Balanced and Unbalanced Forces, Magnetic and Electrical Interactions.
3. When they decide what idea will record allow them to work a storyboard to draw what your ad will look like.
4. After they complete the storyboard, they will choose the material needed. Remind them to use the materials available on the Makerspace. This includes markers, paper, cardboard, among others. They can add elements that make their decoration different.
5. Discuss with each team about what their project will be. Provide recommendations.

### Part 3 - How to Stop Motion App. (5 min)

1. The teacher will proceed to explain the application interface and the functions that the students will be using. This will allow students to see the application when it is explained live. It is important that they make small movements and take enough pictures to make them look natural. They should also keep the iPad in one place at all times. They can use a tripod if they have it available. Allow students to explore the application.

### Part 4 - Record and share (20 min)

1. Once the designs have been verified, allow the students to record. Thoroughly check the quality of these. If necessary repeat the procedure. The important thing is for students to demonstrate what

- they can do with the acquired knowledge related to force and movement.
2. Allow each group to present their work and receive feedback from their peers. Ask questions to see how they apply the concepts of science and technology.