# Balls inside the Slinky

## Asian Try Zero G 2018

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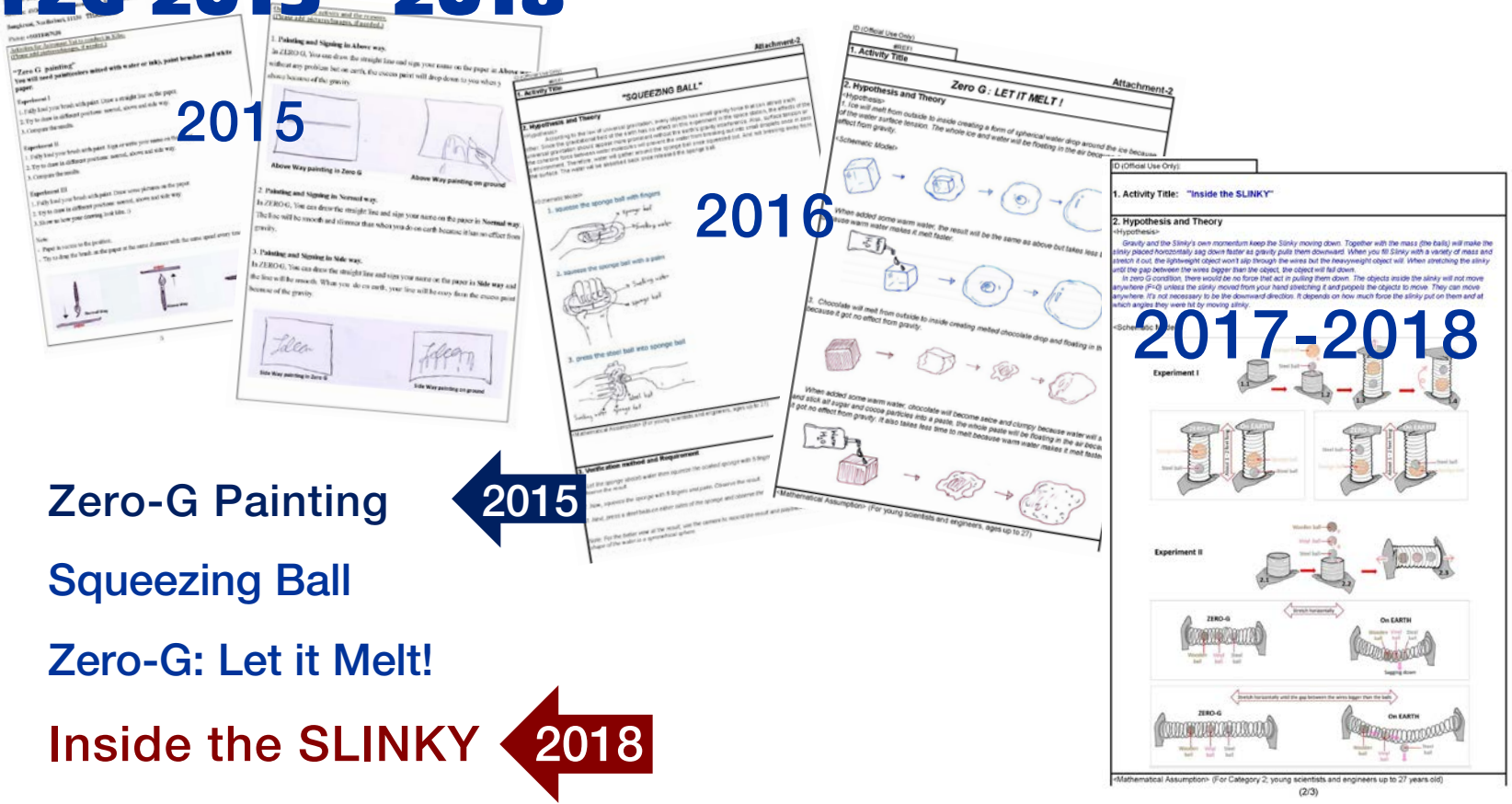
# ATZG 2015 - 2018




- Zero-G Painting — 2015
- Squeezing Ball
- Zero-G: Let it Melt!
- Inside the SLINKY — 2018

# HOW DID THE IDEA COME TO US?

As for the 2018 Try Zero G experiment, the name is **“Inside the Slinky”.** This idea came to us spontaneously. When we went to look for our toy *slinky* in the toy trunk. We found a slinky with numerous toys getting stuck inside and hanging from it. So we planned out an experiment; putting balls of different weights but same size inside the slinky. Then proceed to stretch the slinky horizontally and vertically and observe how three balls move inside the Slinky.

# EXPERIMENT PURPOSE

To observe how three balls move inside the Slinky

when applying vibration and centrifugal force to the Slinky.

# MATERIALS

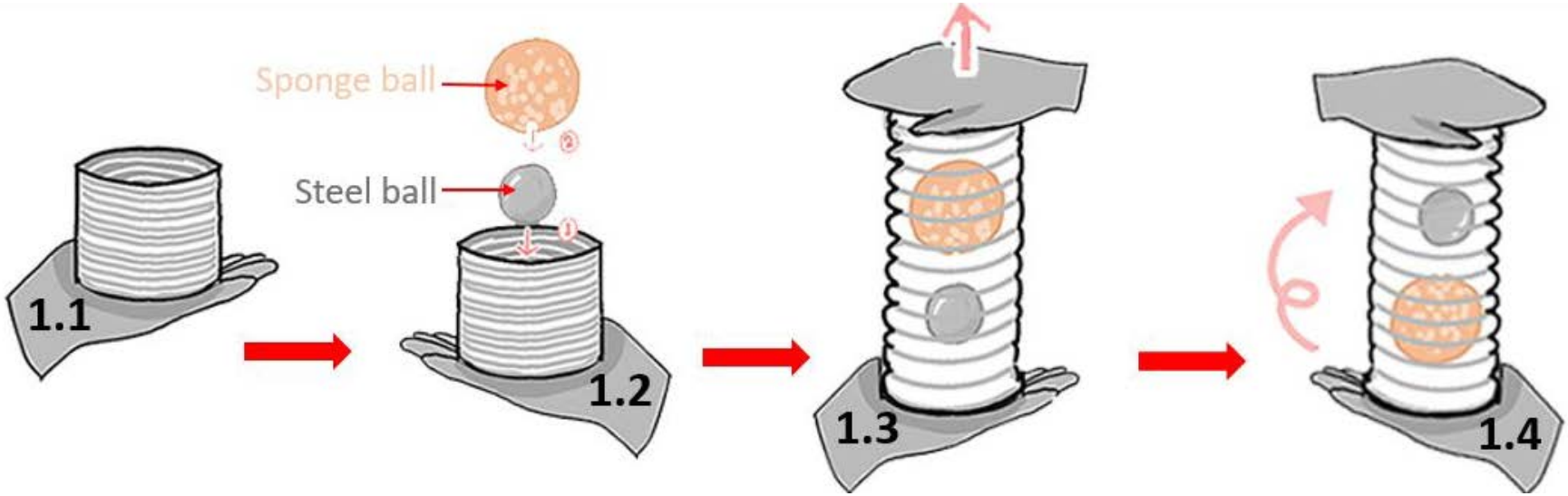
- Sponge Ball with diameter of 45 millimeters and mass of 1.2 grams.
- Mass Comparison Kit (Balls): Steel, Vinyl and Wood
- Slinky





# METHODS

## Experiment I



# METHODS

Experiment I

1.1 Have your palm faced up and hold one end of the slinky.

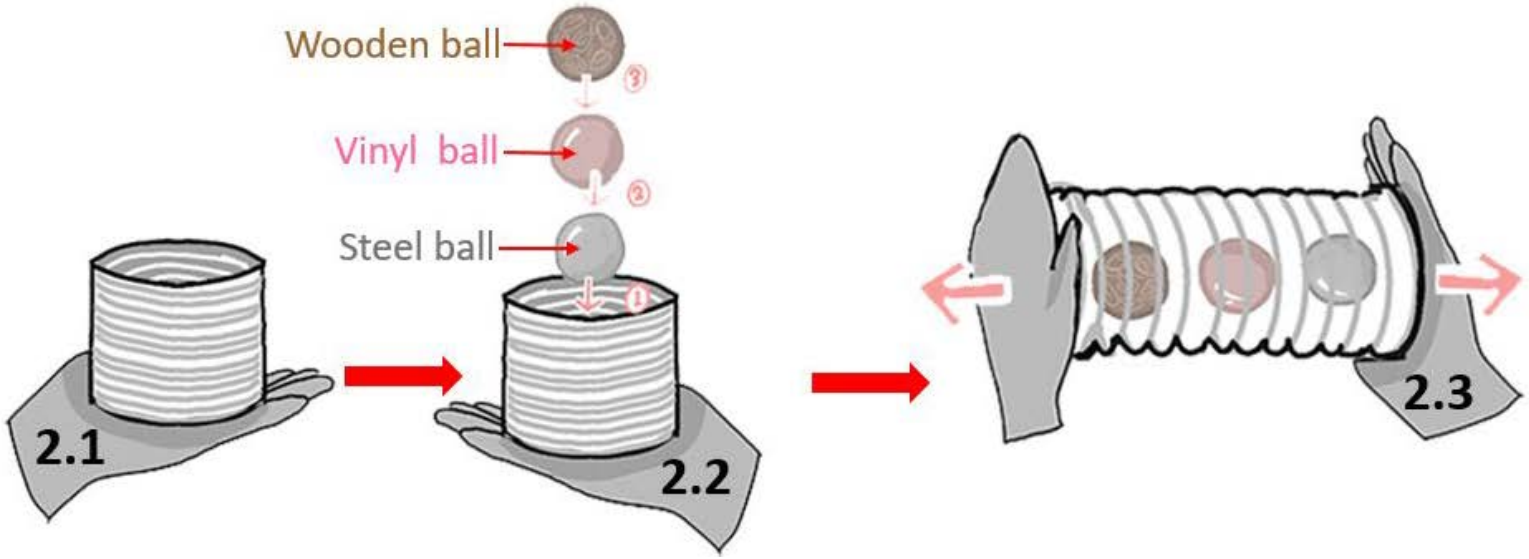
1.2 Insert **steel ball** then **sponge ball** into the opening on the top. Observe.

1.3 Hold both ends of slinky with your hands (palms facing each other). Begin stretching the slinky vertically to between 1 and 2 feet long. Observe.

1.4 Repeat 1.1-1.3, but ,this time, flip the slinky upside down before begin stretching it. Observe.

# METHODS

Experiment II



# METHODS

Experiment II

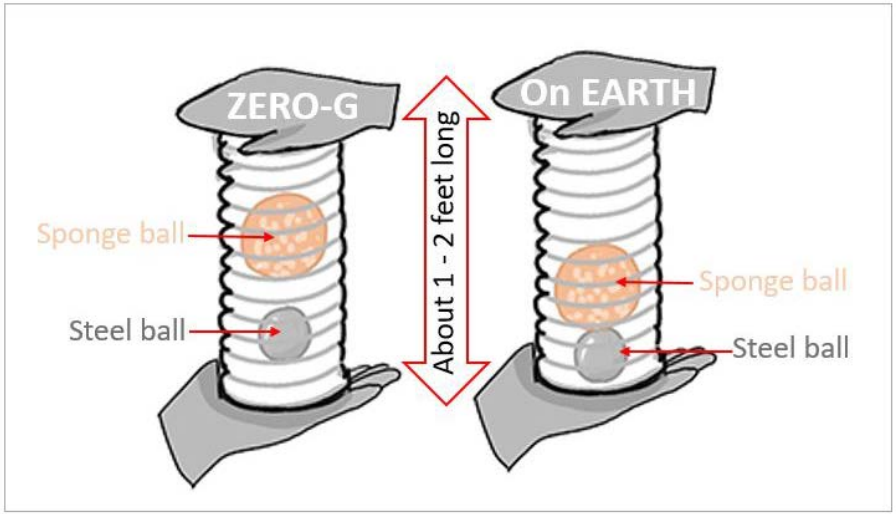
2.1 Have your palm faced up and hold one end of the slinky.

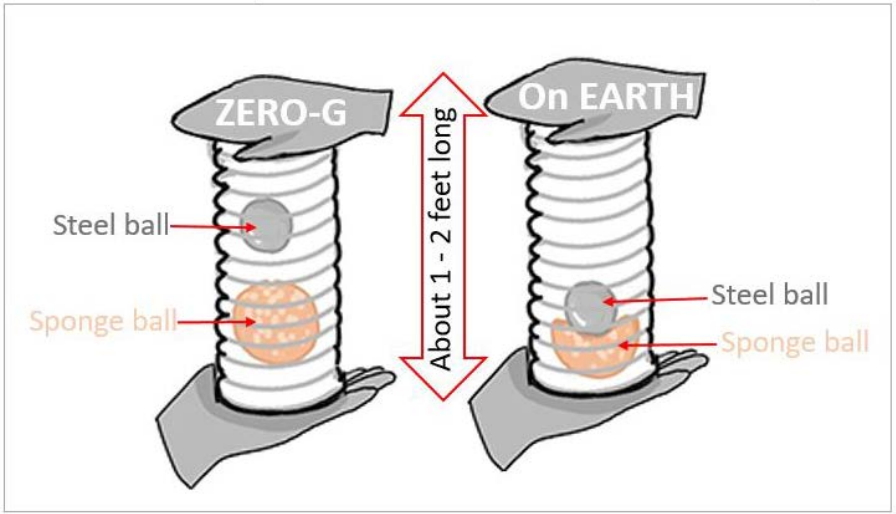
2.2 Insert 3 balls from Mass Comparison Kit into the opening on top of slinky. Place the balls vertically by arranging them from the heaviest to the lightest ; **Steel**, **Vinyl** and **Wooden ball.** Observe.

2.3 Hold both ends of slinky with your hands (palms facing each other). Begin stretching the slinky horizontally to between 2 and 3 feet long or until the gaps between the wires are bigger than the balls. Observe.

# HYPOTHESIS

Experiment I



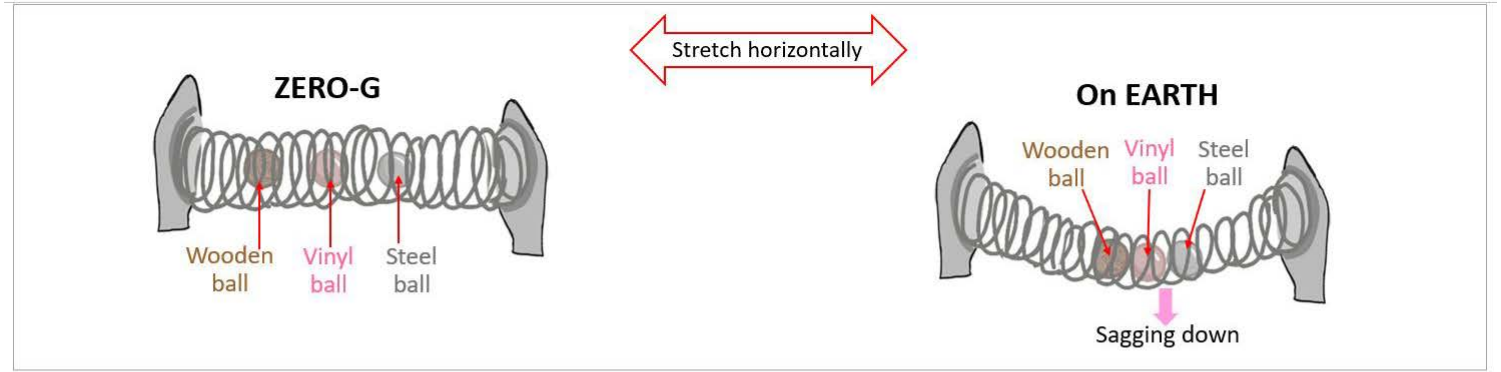
# HYPOTHESIS

## Experiment I

Gravity and the Slinky's momentum keep the Slinky moving down. Together with the mass (the balls) will make the slinky placed horizontally sag down faster as gravity pulls them downward. When you fill Slinky with a variety of mass and stretch it out, the lightweight object won’t slip through the wires but the heavyweight object will. When stretching the slinky until the gaps between the wires are bigger than the object, the object will fall down.

# HYPOTHESIS

## Experiment II



# HYPOTHESIS

## Experiment II

In zero G condition, there would be no force that act in pulling them down. The objects inside the slinky will not move anywhere (F=0) unless the slinky moved from your hand stretching it and propels the objects to move. They can move anywhere. It's not necessary to be the downward direction. It depends on how much force the slinky put on them and at which angles they were hit by moving slinky.

# RESULTS

Experiment I

# RESULTS

Experiment II

# RESULTS

The result of the experiment went accordingly to the hypothesis. Unlike on earth, the balls weren't pulled by the force of gravity. Therefore, they didn't fall down toward one direction but rather float around regardless of their weights. According to the first law of Newton, the object will keep moving in the same direction if there's no other force that acts on it. When the inside of the slinky hit the ball, they move in straight line until the slinky or other ball hit them again, propelling them toward another direction. Even when they're held vertically, the metal ball won't fall and squash the sponge one. When held horizontally, none of the ball fall off the slinky by their weight unless pushed with enough force.

# RESULTS

The result of this experiment, we can adapt the knowledge obtained from this to help develop the transportation process in zero gravity. Weightless object must be easier to move around when compared to objects with weight. However, another factor that could matter in null gravity environment is shapes. To study how to control the directions of these objects in zero gravity condition, we have to further the experiment with objects of the same mass but different shapes moving inside the greater diameter silky.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