ORLANDO SCIENCE CENTER

Discovery Lab Pre-Visit Activities

SuperHero Science

Grades K-2

Thank you for booking your field trip to the Orlando Science Center! As a means of preparing your students for their Discovery Lab and enhancing their experience, we are providing you with these pre-visit materials to share with your class.

Discovery Lab Objective:
Faster than a speeding sound wave, more powerful than a magnetic force field! Use science to create your own super powers and unlock your inner superhero with out amazing activities—drawn from your favorite comics!

Next Generation Sunshine State Standards:
SC.K.N.1.1, SC.K.N.1.3, SC.K.P.10.1, SC.K.P.12.1, SC.1.N.1.1, SC.1.N.1.3, SC.2.N.1.1, SC.2.N.1.2, SC.2.P.8.1, SC.2.P.8.2, SC.2.P.8.3, SC.2.P.13.2

Key Vocabulary:

- **Attract:** to pull toward
- **Force:** a push or pull that makes something move
- **Friction:** a force that slows down or stops moving objects
- **Gas:** one of the fundamental states of matter in which the molecules do not have a fixed volume or shape
- **Liquid:** one of the fundamental states of matter with a definite volume but no definite shape
- **Matter:** anything that has mass or takes up space
- **Repel:** to push away
- **Solid:** one of the fundamental states of matter with a definite shape and a definite volume

Key Concepts:

- Things move in different ways, such as fast, slow, etc.
- Objects can be classified in terms of their properties, such as attraction and repulsion of magnets.
- Magnets can be used to make some things move without touching them.
- Objects and materials may be a solid, liquid, or gas.
- Solids have a definite shape and liquids and gases take the shape of their container.
- Things that make sound vibrate.

Discussion Topics:

- A superhero is a character with extraordinary or superhuman powers.
  If you were a superhero, what super powers would you have? What super powers do you think would be the most useful?
- Sound is a form of energy caused by vibrations.
  How are sounds made? Brainstorm different sounds and what happens to create those sounds.
- Friction is a force that slows down or stops moving objects.
  Create a learning web on what stops motion by having students brainstorm situations where motion is stopped. Guide student responses by asking: What makes a car stop? A baseball? A plane?

In Class Activities:

- Investigate the forces of super strength and make your students feel like superheroes! This simple demonstration uses vertical and horizontal forces to help your students overpower you and push your hands apart, no matter how hard you may try to keep them together! Make two fists and stack them one on top of the other. Extend your arms until your elbows are as straight as possible. Your goal is to attempt to keep your fists together, while your student attempts to knock your fists apart using just their fingertips. Your student should place his or her fingertips on the back of each of your hands and give your hands a very quick sideways push (making sure to push your fists in opposite directions). Despite your best efforts, your fists will separate! In this experiment, you are relying upon vertical forces to keep your fists together. Your top hand is pressing down and your bottom hand is pressing up. The two forces are balanced and your hands will remain at rest until acted upon by an outside force (like your student's fingertips!). When your student pushes upon your hands, they are applying a horizontal force. Because you are applying vertical forces, you are unable to balance out the horizontal force from your student's fingers, causing your fists to easily slide off each other.
- Go on a scavenger hunt for the three states of matter. Provide teams of students with a large paper bag or cardboard box. Give teams 15 minutes to search the classroom for items that are solids, liquids, or gases and place them in their bag or box. One at a time, have each team display the items that they selected for the rest of the class and identify the state of matter that it represents. As each item is displayed and identified, the rest of the class will show a thumbs-up sign if they agree with the classification or a thumbs-down sign if they disagree. As a class, discuss any items that students may have disagreed on.

Additional Resources:

http://www.physics4kids.com
http://www.physicscentral.com/
http://www.chem4kids.com
http://www.acs.org/education
http://pbskids.org/zoom/games/kitchenchemistry/