ORLANDO SCIENCE CENTER

Discovery Lab Post-Visit Activities

SuperHero Science

Grades 3-5

We hope that you enjoyed your visit to the Orlando Science Center! As a means of enhancing and extending your students' Discovery Lab experience into the classroom, we are providing you with these post-visit materials to share with your class.

Discussion Topics:

- Some super powers enable superheroes to do things quicker than ordinary people can. Some super powers give superheroes the ability to do things that are impossible for ordinary people to accomplish, such as flying. We are not able to fly on our own, so we have used science and technology to create airplanes and rockets that enable us to fly through the skies and into outer space!

  What are some other ways that we have used science and technology to perform super tasks?
- Static electricity is created when an item gives up or gains electrons.

  How can we use static electricity to make objects move? What kinds of materials are affected by electric charges? How strong is the force of an electric charge compared to the force of gravity?

In Class Activities:

- Prepare a pH indicator from fresh red cabbage. When neutral, the cabbage juice indicator will be a purple or blue color. It will change pink or red when mixed with chemicals that are acids and green or yellow when mixed with chemicals that are bases. To prepare your indicator, finely chop or shred two cups of fresh, red cabbage. Place the chopped cabbage in a large beaker or glass bowl and add boiling water until the cabbage is covered. Allow the cabbage to soak in the hot water for approximately ten to fifteen minutes. The color will be leached from the cabbage and the liquid will turn a dark purple. Strain and remove the pieces of cabbage from the liquid. Your indicator is now ready for use! Use the indicator as a liquid by pouring small amounts (approximately 10-mL) of the solution into cups and adding the chemical you wish to test. You can also create pH paper from your indicator by soaking coffee filters in the liquid. After a few hours, remove the coffee filters and allow them to dry. Once dry, cut into strips. Dip the strips into whatever solution you wish to test and observe the resulting color change.
- Draw a picture using color-changing markers (such as Crayola Color Switchers™). Ask students to hypothesize how the colors are able to change. Experiment by swabbing various chemicals (such as water, vinegar, bleach, hydrogen peroxide, or a solution of baking soda and water) onto the pictures with cotton swabs. Observe the effects of each solution on each of the colors.

Math Problem:
Super Boy and Super Girl were comparing their super powers.

- In 2 hours, Super Girl can run 220 miles. Super Boy can only run 160 miles in the same amount of time. Calculate Super Girl's and Super Boy's speed in miles per hour (mph). How many miles per hour faster can Super Girl run?
- Super Girl can lift a car weighing 1 ton (1 ton = 2000 lbs). Super Boy can lift a school bus weighing 5 tons. How many more tons can Super Boy lift? How many more pounds?
- Super Girl can jump over a 16-story tall building in a single leap. Super Boy can jump over a 9-story tall building in a single leap. If a single story of a building is 10 feet high, how high can Super Girl jump? How high can Super Boy jump? How many feet higher can Super Girl jump than Super Boy?

Writing Prompt:
Imagine that you awoke one morning and found that you had become a super hero or heroine overnight! Write two to three short paragraphs about your adventurous day with your new super powers.

- What super powers do you have?
- How did you get them?
- How would you use your new super powers?

Art Project:
Master the power of magnetism to create abstract works of art. You will need stiff paper, large magnets, and iron fillings to create your magnetic masterpieces. If you do not have iron filings, you can cut steel wool into very small pieces with a pair of scissors. Set a large magnet on the surface of the table and lay a sheet of stiff paper over it. Sprinkle the iron filings on top of the piece of paper. Gently tap or move the paper over the magnet to create interesting patterns. When you are happy with your magnetic masterpiece, spray it with several light coats of clear spray fixative, allowing it to dry between each application. When your finished artwork is completely dry and set, you may slowly remove the magnet.

Additional Resources:
Physics: Why Matter Matters! by Simon Basher (Kingfisher)
Eyewitness: Chemistry by Ann Newmark (DK Children)
The World of Matter (Newbridge)
Discovering Electricity (Newbridge)
Forces and Motion (Newbridge)