The Static Electric Slide

Overview: Paula Abdul and MC Skat Kat hit the nail on the head in 1989 – opposites do attract. In this activity, students hold the power of **static electricity** in their hands and learn (from a scientific standpoint) that opposites really do attract as they have a hilarious time with this easy to follow station based activity.

Procedure:

1) Vigorously rub an inflated balloon in your hair and let your class giggle as your hair stands on end. Give students the following writing prompt: *Why do you think the balloon made my hair stand up like that?* After students have written their responses, encourage them to share their ideas with the class.
2) Split students into groups for 4 stations. This would be a great time to use peer helpers or parent volunteers.
3) For a fun twist, play the song "The Electric Slide" during station rotation times, encouraging students to "sliiiiiiiiide on over to the next station."
4) Follow directions for each station. As each rotate through the stations, make sure to have the students keep the following data:

What do you think is going to happen to the _____?

What actually happened to the _____?

Why do you think you were correct/incorrect?

5) Stations

Station 1 – Yes, you can!

1. Place an empty aluminum can on a flat smooth surface.
2. Ask the student if they can make this can roll without touching or blowing on it.
3. Instruct the student to give the balloon a negative charge by swiftly and vigorously rubbing an inflated balloon back and forth through his hair.
4. Get ready - - The student holds the balloon close to the can, but not touching. The negatively charged balloon attracts the neutrally charged can, pulling the can toward it.

Station 2 – Clean up this mess!

1. Scatter a handful of confetti sized torn tissue paper on a smooth surface.
2. Ask the student if they can clean this up without touching the paper with their hands.
3. Instruct the student to give the balloon a negative charge by swiftly and vigorously rubbing an inflated balloon back and forth through his hair.
4. Student holds the balloon above the paper without touching and is delighted as the negatively charged balloon attracts the neutral paper.

Station 3 – Hanging by a thread…

1. Tie a 12-18 inch piece of thread through an O shaped cereal you have on hand. Tie the other end to a fixture so that there is at least 12" of room on all sides of the cereal. (Under a desk might be a good place, if you don't mind working on the floor.)

2. Ask the student if they can move the cereal without touching it.
3. Instruct the student to give the comb a negative charge by rubbing it vigorously on a wool or fleece blanket for a 30 count.
4. As the student slowly brings the comb towards the cereal, it will pull the cereal towards it. This is because the comb is negatively charged and the comb is neutral. Hold still – the cereal will drop on its own as electrons move from the comb to the cereal.
5. Bring the comb towards the cereal again. It moves away this time as both the comb and the cereal now have a negative charge.

Station 4 – Bend it like Beckham

1. At a sink with a light but steady flow, ask your student to make the water bend. (Stand back, you are probably going to get splashed.) Now give the student a comb and ask if that will help.
2. Using a dry comb, instruct the student to give the comb a negative change by vigorously rubbing it on a wool or fleece blanket for a 30 count.
3. Slowly move the comb towards the water and watch how it bends away from the comb. This is because water has an uneven distribution of electron density, creating a partial negative charge.

6) Introduce the concept of static electricity to your class. Click here for a concise way to explain static electricity and negative electron charge.
7) As a class, brainstorm other things we might try to move using static electricity. (*If you are daring enough you could even have the students remove their shoes and make static on the carpet!)*

ASOLs Covered in this Activity:

SCIENCE

3S-FME 1a: The student will investigate and understand that natural and artificial magnets have certain characteristics and attract specific types of metals. Key concepts include magnetism, iron, magnetic/nonmagnetic, poles, attract/repel

5S-FME 2: The student will investigate and understand characteristics of electricity. Key concepts include

a) Conductors and insulators;
b) Basic circuits
c) Static electricity

Extension Idea:
Create a 5th station using pencil shavings. When students bring a negatively charged balloon or comb near a pile of pencil shavings, what happens? What kind of charge does this mean the shavings have? What other factor could affect attraction/repulsion. Try this experiment with a mixture of salt and pepper and see what happens.

8S-FME 3: The student will investigate and understand the nature of matter. Key concepts include

a) the particle theory of matter
b) physical properties

Extension Idea:

While going through the stations, create opportunities to investigate the physical properties of each material use, particularly: appearance, texture, color, and odor. As electrons are responsible for the static electricity, this is a good time to introduce the particle theory of matter paying special focus to electrons as subatomic particles.

5S-SI 1: The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which

a) distinctions are made among observations, conclusions, inferences, and predictions;
b) objects or events are classified and arranged according to characteristics or properties;
c) appropriate instruments are selected and used to measure length, mass, volume, and temperature in metric units;
e) predictions and inferences are made, and conclusions are drawn based on data from a variety of sources;
f) independent and dependent variables are identified;
g) constants in an experimental situation are identified;
h) hypotheses are developed as cause and effect relationships;
i) data are collected, recorded, analyzed, and displayed using bar and basic line graphs;
k) data are communicated with simple graphs, pictures, written statements, and numbers;

5S-SI 2 The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which

b) estimates are made and accurate measurements of length, mass, volume, and temperature are made in metric units using proper tools;
d) hypotheses are formed from testable questions;
e) independent and dependent variables are identified;
f) constants in an experimental situation are identified;
g) data are collected, recorded, analyzed, and communicated using proper graphical representations and metric measurements;
h) predictions are made using patterns from data collected, and simple graphical data are generated;
i) inferences are made and conclusions are drawn;

8S-SI 1 The student will demonstrate an understanding of scientific reasoning,

logic, and the nature of science by planning and conducting investigations which
a) observations are made involving fine discrimination between similar objects and organisms;
b) precise and approximate measurements are recorded;
e) a method is devised to test the validity of predictions and inferences;
f) one variable is manipulated over time, using many repeated trials;
g) data are collected, recorded, analyzed, and reported using metric measurements and tools;
h) data are analyzed and communicated through graphical representation;

HSS-SI 1 The student will plan and conduct investigations in which
c) scales, diagrams, charts, graphs, tables, imagery, models, and profiles are constructed and interpreted;
e) variables are manipulated with repeated trials.

HSS-SI 2 The student will demonstrate an understanding of the nature of science and scientific reasoning and logic. Key concepts include
b) evidence is required to evaluate hypotheses and explanations;
c) observation and logic are essential for reaching a conclusion

Extension Idea:

These standards can be addressed through the course of this activity's scientific process.

READING & WRITING

3E-RW 2a: The student will use newly acquired vocabulary drawn from reading and other content areas.
3E-CN 1g: The student will sequence at least two steps in a procedure or ideas/incidents in an event.
4E-RW 1c: The student will use newly acquired vocabulary drawn from reading and other content areas.
4E-CN1d: The student will identify the chronological structure of a text (first, then, next).
5E-RW 1f: The student will demonstrate understanding of content-specific words.
6E-CN 1c: The student will sue content words and phrases from nonfiction text.
7E-CN 1e: The student will use content words and phrases from a nonfiction text.
8E-RW 1e: The student will acquire and use content words and phrases.
HSE-RW 2c: The student will acquire and use content words and phrases.
5E-WP 7a: The student will write to convey ideas and information clearly by selecting a topic using related visual, tactual, or multimedia information.
8E-WP 1a: The student will write to convey ideas and information including facts, details, and other information.
b: The students will write about a personal experience by introducing the event or experience, at least one character, and two or more events in sequence.
d: The student will use content specific vocabulary when writing about a topic.
8E-WP 3b: The student will write to convey ideas and information including facts, details, and other information as well as graphics and multimedia as needed.
HSE-WP 1b: The student will write to convey ideas and information using clear organization and including facts, details, and other information as well as graphics and

multimedia as needed.

Extension Ideas:

1. Give student a photocopied picture of yourself (or someone else) with their hair standing on end, as it did in the activity introduction. Include a word bubble at the top. Ask students to create a caption in the word bubble. When students are complete, encourage them to share with the class. Bind and include in your class self-selected reading nook.

2. Assign each student one station of the activity. Students should use drawings, words, or a combination of both to make an instruction manual that can be followed to recreate the activity. Once manuals are completed, give students the opportunity to work with a peer helper, parent, trusted adult or in-class partner - following the steps and demonstrating their newly learned knowledge. Finished products could be on paper, using augmentative communication, or on the computer. Students can present by posting a video, one-on-one, or in front of the class using a projector.

MATH

3M-MG 2: The student will
b) identify standard units of measure for mass and volume
c) measure length of objects using standard tools, such a ruler, yardsticks, and meter sticks

4M-MG 1a: The student will identify smaller measurement units that divide a larger unit within a measurement system.

5M-MG1a: The student will use customary units to measure weight and length of objects.

6M-NSCE 3a: The student will compare the relationships between two unit fractions.

8M-MG 2a: The student will identify volume of common measure (cups, pints, quarts, gallons, etc.)

Extension Idea:

Use students to help set up the stations. Brainstorm with students what measurement tools could be used for each materials. Introduce a scale, some measuring cups and spoons, a ruler, and various non-standard means of measurement. Rather than "a pile of tissue paper" instruct the student to measure out 1/8 cup. (To extend this further, have the student 1/8 c and ¼ c and examine the relationship between the two amounts by sight and measure weight.) Instead of a "handful of pencil shavings" have the student weigh 1 oz. of shavings. A ruler could be used for measuring the string, or non-standard measurements could be used, as in "the length of one desk."

7M-PSPFA 1a: The student will describe the probability of events occurring as possible or impossible.

Extension Idea:

Prior to beginning each station, inquire from student whether the task at hand is possible or impossible. “Is it possible to push a can without touching it?” After completing the task, give the student time to reflect and revise their beginning probability assessment.

Materials Needed:
-several balloons
- several combs
- tissue paper
- running water
- string or yarn
- O shaped cereal
-empty aluminum can
- data template
- pencil shavings (extension)
- salt and pepper (extension)

Instructional Setting:
Ideally, this activity requires room for the students to move between stations, but can also be done one station at a time in the whole group environment if space is a concern.

Community Connections and/or Peer Interaction:
Students can work together in small groups. This is an ideal time to bring in peer helpers, parents, or other teachers to assist.

Functional Activity/Routine:
This activity encourages functional skills such as turn-taking, following instructions, sequencing and cleaning up afterward.

Strategies to Collect Evidence:
For collection of evidence, be sure that each student records a hypothesis and data individually.

Specific Options for Differentiating this Activity:
-Conduct the experiments on surfaces that can be accessed by all students.
-Introduce stations, or more than one activity at each station to assist with limited mobility.
-For students with poor fine motor skills, blow up balloons in several different sizes to accommodate needs.
-Allow students to use their preferred “pencil” when writing. This may include a writing utensil, keyboard, alternative pencil, or dictating to a scribe.
-Prepare, as necessary, for each student to make choices and communicate with their preferred method. This may include using augmentative communication.