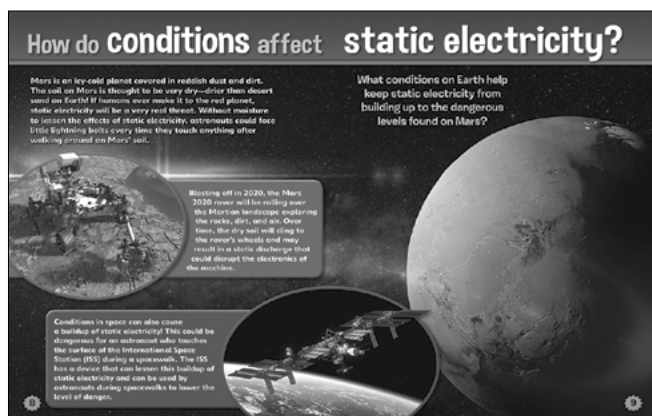


What Conditions Affect Static Electricity?



Focus: Students explore how varying conditions affect static electric charges.

Specific Curriculum Outcomes

Students will be expected to:

- 39.0 identify conditions that affect the force of static electric materials [GCO 1/3]
- 10.0 make and record observations and measurements [GCO 2]
- 2.0 communicate using scientific terminology [GCO 2]

Performance Indicators

Students who achieve these outcomes will be able to:

- plan an investigation to test how a variety of charged materials interact in various conditions
- record and communicate observations and results of their investigation

NOTES:

Attitude Outcome Statements

Encourage students to:

- willingly observe, question, and explore [GCO 4]

Cross-Curricular Connections

English Language Arts

Students will be expected to:

- respond personally to a range of texts [GCO 6]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• <i>Ada Twist, Scientist</i> (Read Aloud) • Student Magazine, pages 8–11 • <i>What Is the Inquiry Process?</i> poster	• variety of objects such as inflated balloons, plastic combs, Ping-Pong balls, plastic rulers, foam plates • fabric such as felt, cotton, polar fleece, silk, wool, and fur • humidifier or spray bottles • students' Science Journals • digital camera (optional)		• observe • question • problem • predict • explore • inquire • investigate • measure • record • conclude

Science Background

- A charged object is surrounded by an electric field which exerts electrical force on other things within the field.

ACTIVATE

Read Aloud: *Ada Twist, Scientist*



Summary

Ada Twist is a young girl with endless curiosity. She conducts scientific investigations in an attempt to understand the things she observes around her. Ada comes to realize that her questions might not always lead to answers, but rather to more questions.

Before Reading

Show students the cover of the book and read aloud the title. Ask:

- What does the word “scientist” suggest?
- What do you think this story might be about?

Involve students in a Think-Pair-Share strategy. After providing time for students to ponder the questions, have them turn to the person next to them

and share their thinking. After students have had a chance to share their thinking with a partner, invite a few students to share their ideas with the class. Ask students to listen as you read to discover what traits or characteristics Ada had that made her a great scientist.

During Reading

As you read the story to students, pause to discuss the text and illustrations. Clarify vocabulary as necessary. Alternate by asking students to respond in a whole group or with a partner. Prompts for discussion could include:

- **What does it mean to look all around and observe the world?**
- **How can our observations lead to questions?**
- **How did Ada follow up on her questions?** (research, hypothesis/prediction, testing, thinking, more questions)
- **What did Ada do when her first prediction or hypothesis didn't work out?** (She turned to her second prediction to investigate.)
- **Why do you think it's important to record our thinking while we explore and investigate?**

After Reading

Review the traits or characteristics Ada had that made her a great scientist. If students don't suggest the following, you might introduce the traits of:

- curiosity (She asked questions about everything she observed around her.)
- imagination (She came up with more than one hypothesis to investigate for each question.)
- determination (She didn't give up when her first idea didn't work out. She decided to test out another idea.)

Discuss with students why asking questions about what we observe is the first step in exploring and investigating to find answers.

I Remember

Hold a class discussion about how conditions affect static electricity. Encourage students to think about what they have observed. Prompts for discussion might include:

- **When have you observed the effects of static electricity? What were you doing?**
- **What did you see, feel, or hear?**
- **Was the weather warm or cold?**
- **Was it humid or dry?**
- **Was it inside or outside?**
- **Is there more static electricity in winter or in summer? Why do you think so?**

Make a class list of the various conditions that could affect static electricity such as:

- distance a charged object is held from another object
- humidity in the air (moisture)
- material used to charge the object
- how many times the object is rubbed to charge it

CONNECT

Changing Conditions

Tell students they will be working in small groups to plan an investigation to see how a variety of charged materials interact in various conditions. Students can refer to the class chart of conditions that could affect static electricity and choose one condition to test at a time. Prompt their thinking by asking:

- **What conditions affect static charges?**
- **How could you test one of these conditions?**

Review the *What Is the Inquiry Process?* poster with the students. Remind students to make and record observations and measurements in their Science Journals. Students may choose to record through writing, drawing, charts or tables, or by taking digital images or video.

Groups can share their investigations with the whole class by stating the question they investigated, the procedure they followed, and the results they obtained. Invite students to identify any new questions that arise from their investigations.

Static Electricity in Space

Introduce pages 8–9 of the Student Magazine to the class. Have students examine the images and then share-read the text together. Ask:

- **What are the conditions on Mars that affect static electricity?** (extreme dryness; lack of humidity on Mars; extreme cold)
- **How might a static discharge damage electrical equipment in space?**
- **How can the static electricity be safely discharged on the ISS (International Space Station)?**
- **What are the conditions on Earth that help to stop the buildup of dangerous levels of static electricity?**

CONSOLIDATE

Static Stan

Have students examine pages 10–11 of the Student Magazine. Invite students to explore the adventures of Static Stan to discover how static electricity can be avoided or reduced in their own lives. Discuss the positive uses of static electricity shown. Students can create their own comic strip or continue the adventures of Static Stan in other situations.





Static Electricity Foldable

Students can create a foldable for static electricity terms.

EXPLORE MORE



Poster Power

Students can create a poster showing how to reduce or avoid harmful effects of static electricity in daily life.