

Stuck on You

<p>Science Standard IV: Students will understand features of static and current electricity.</p> <hr/> <p>Objective 1: Describe the behavior of static electricity as observed in nature and everyday occurrences.</p> <hr/> <p>Intended Learning Outcomes:</p> <ol style="list-style-type: none"> 1. Use Science Process and Thinking Skills 3. Understand Science Concepts and Principles 4. Communicate Effectively Using Science Language and Reasoning <hr/> <p>Content Connections: Language Arts VIII-2, 3</p>
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Science
Standard
IV

Objective
1

Connections

Invitation to Learn

Begin with a riddle.

Clues

1. I like to move from place to place.
2. When the toaster and TV are on, I am there.
3. When the doorbell buzzes, I am there.
4. I amaze, delight, and help people every hour, day after day.
5. I have a home in various places.
6. You can't see or hear me.
7. I light up things.
8. I am present in thunderstorms.
9. Can you guess who I am? If you're right it could be downright shocking to you! (electricity)

We will be studying electricity for the next few weeks. First, let's assess what you already know by creating a foldable called a K-W-L-H chart. It stands for:

What you already **K**now.

What you want to find out.

What you **L**earned.

How you can learn more.

We will add new information to our chart throughout the unit.

K-W-L-H Chart			
What We Know	What We Want to Find Out	What We Learned	How We Can Learn More

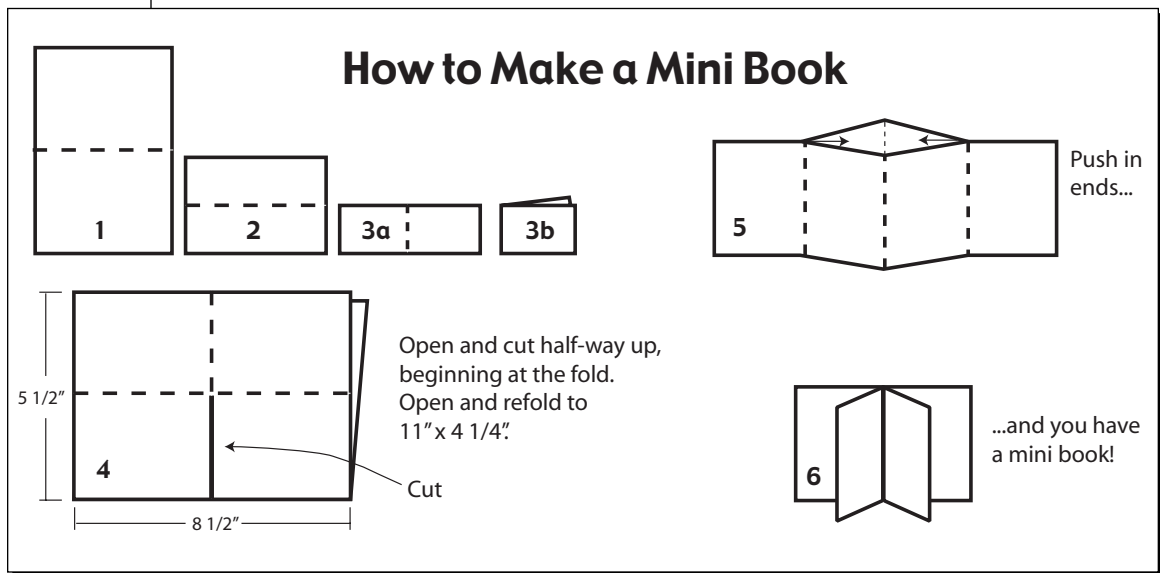
Instructional Procedures

Materials

- Two sheets of colored bond paper for each student
- Elmers glue
- Scissors

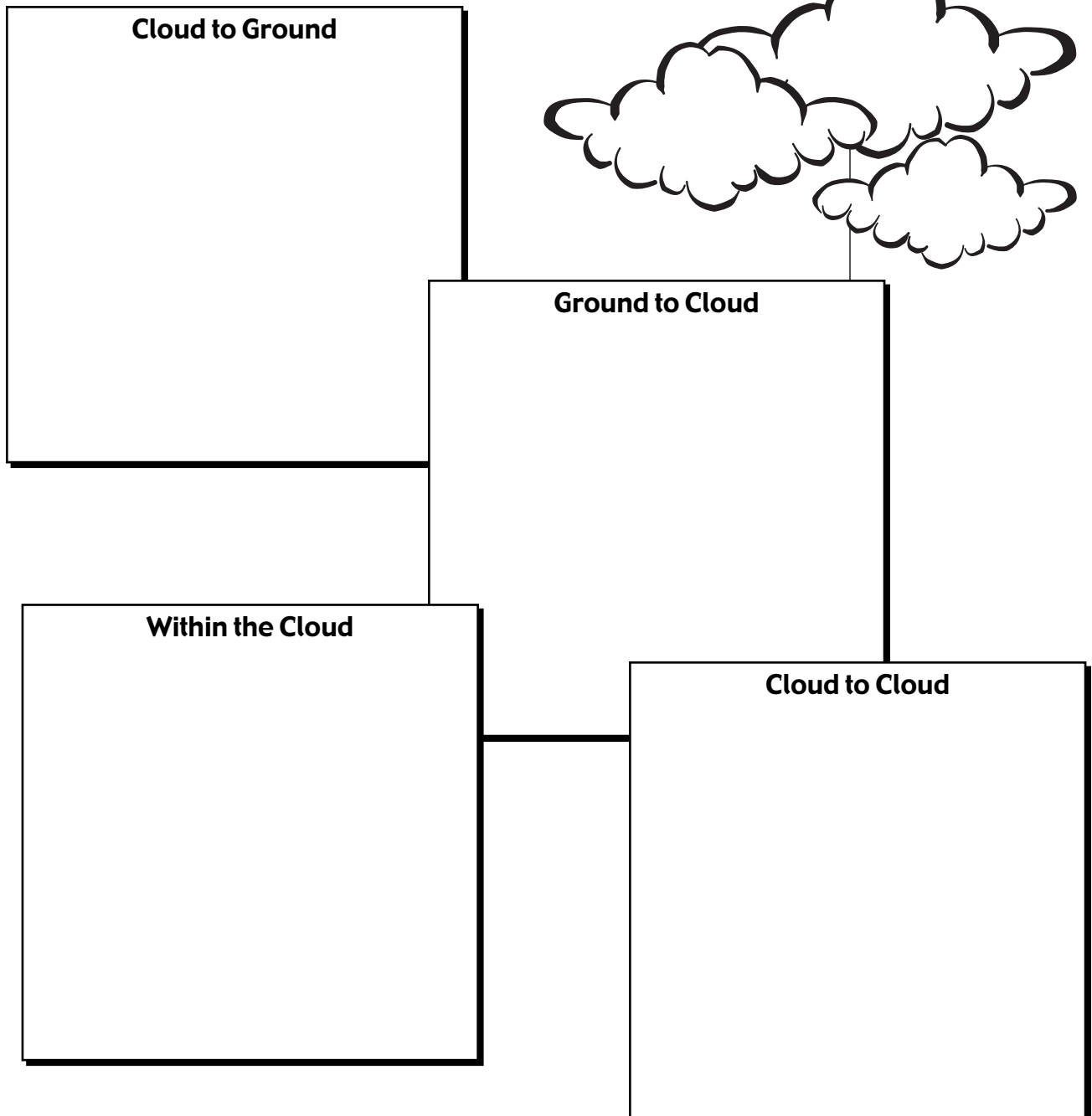
How to Make A Mini Book

1. To make a mini book, fold a sheet of paper in a horizontal fold (hamburger fold).
2. With the paper horizontal, and the fold of the paper up, fold the bottom edge to the top (hotdog fold).
3. With the fold of the paper up, fold in half again (hamburger fold).
4. Open the mini book to the first fold, with the folded edge at the bottom. Cut the along the fold half-way to the top of the paper.
5. Open and re-fold as shown, making a book!

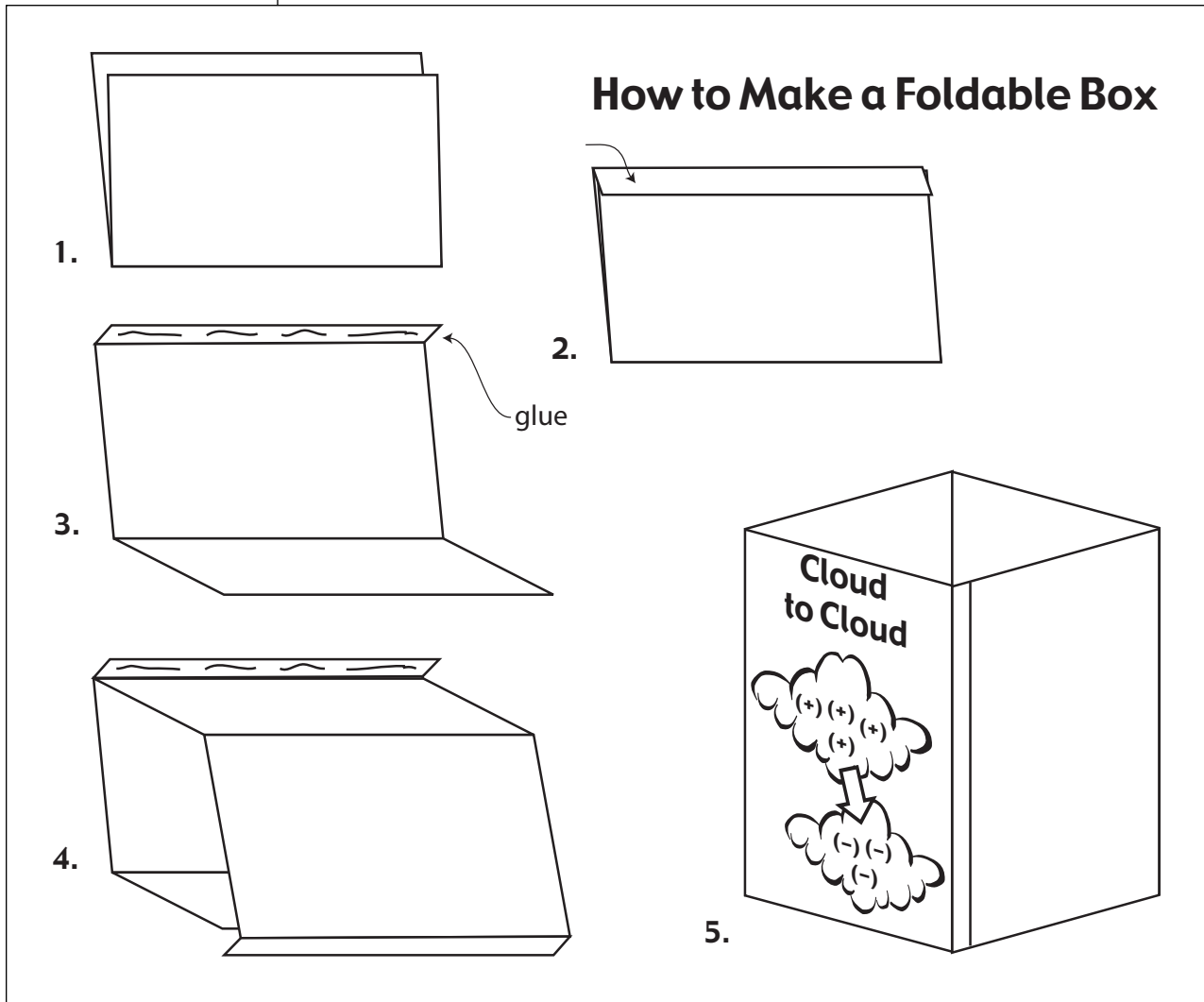


6. Write **K** on the first tab, **W** on the second, **L** on the third, and **H** on the fourth. Have students list what they *know* about electricity under the **K** tab. Then list what they *would like to know* under the **W** tab. This book should be used throughout the unit to assess what students have learned and what they would still like to know.
7. Teacher may appear dressed as Ben Franklin, complete with wig, spectacles, jacket, and a kite in one hand. Read pp. 3-10 in *Who Was Ben Franklin?* Share pictures that show life with and without electricity.

8. *Lightening* is a giant spark of static electricity that forms in the clouds. *Clouds* can be made up of ice crystals (light) and water droplets (heavy). *Ice crystals* have a positive charge; each water droplet has a negative charge. During a thunderstorm, negative charges move from the cloud to the ground and positive charges move from the ground to the cloud. These moving charges are called lightening. Lightening can also move within a cloud, or from one cloud to another.



9. Draw and label the four ways lightening can move. Make a foldable box (see below) to illustrate this principle. Include the charges. Use the titles as headings for each of the four sides of the box. Draw and label the clouds under each heading, include the charges.



Possible Extensions/Adaptations/Integration

- Construct a timeline of electrical discoveries.
- Assign a biographical report on Thomas Edison, Ben Franklin, Guglielmo Marconi, Andre-Marie Ampere, Nikola Tesla, Alessandro Volta, James Watt, Michael Faraday, or Georg Simon Ohm. Write about the individual's life and experiments with electricity.
- Host a biography party where students dress as their inventor and make a mini replica or bring a picture of their invention.

- Create trading cards of their inventor.
- List the three ways to know that static electricity is present:
 1. A crackling sound may be heard.
 2. A spark can be seen and can shock you.
 3. Items cling together with static cling
- Brainstorm a list of everyday occurrences in which static electricity is present.
- Students may write a newspaper article on the lightning storm that hit your town last night using the *News Article Frame* (p. 8-17) as a graphic organizer.
- Create a class newspaper using the inventor biographies or newspaper articles.

Assessment Suggestions

- Make a *Discovery Box* to extend inquiry on questions about electricity. Include items that would make exploration of electricity possible. Include a list of *Inventor—Testable Questions* (p. 8-18) for investigation.
- Using the *Problem/Solution Outline* (p. 8-19) or *Discovery Log* (p. 8-20), have each group write a testable question to research. Go through the steps of the scientific method and come up with a conclusion. Record the investigation in a science journal.

Additional Resources

Books

Hands-on Physical Science Activities, by Marvin N. Tolman;
ISBN 0-13-230178-4

Teaching Science with Foldables, by Dinah Zike (Glencoe McGraw-Hill); Student Edition ISBN 0-07-828238-1, Teacher Classroom Resources ISBN 0-07-828642-5

Lightening, by Seymour Simon; ISBN 0-590-12122-7

Thundercake, by Patricia Polacco; ISBN 0-698-11581-3

Who Was Ben Franklin?, by Dennis Brindell Fradin;
ISBN 0-448-42495-9

Nurturing Inquiry: Real Science for the Elementary Classroom, by Charles R. Pearce (Heinemann); ISBN 0-325-00135-9

Web sites

www.dinah.com

<http://www.uen.org.5thgradescience> (lesson plans Greenwood Biographies)

Family Connections

- Read *Thundercake* as a family on a day that thunder and lightening storms could happen. Make the cake and serve. While eating, count between the thunder and lightening bursts to see how close the lightening is.

Name _____

News Article Frame

Topic _____

Who	What	Where
When	Why	

Important Facts

1. _____
2. _____
3. _____
4. _____
5. _____

Details

1. _____
2. _____
3. _____
4. _____
5. _____

Inventor–Testable Questions

We have been writing testable questions. These are questions that you can answer by experimenting or doing something.

“Is It Possible?” Questions

- Is it possible to make a buzzer ring?
- Is it possible to light up a model community?

Comparing Questions

- When comparing C batteries with D batteries, which will light a bulb the longest and the brightest?
- When comparing conductors and insulators which materials will allow electricity to flow through them the easiest?

“What If?” Questions

- What if I added one more battery to a series circuit?
- What if I added more lights to a series circuit and kept the same amount of batteries?
- What if I made a circuit using a lemon, potato, or used liquids? Will electricity pass through salt water, Gatorade, orange juice, or colored water?

“How Can We?” Questions

- How can we create a newspaper using the results from all our discoveries in electricity?
- How can we discover which batteries last the longest?
- How can we use a telegraph to communicate with the other classroom?

“What Is?” Questions

- What is a series circuit?
- What is an AC/DC current?
- What is lightning?

Name _____

Problem/Solution Outline

Inventor _____

Problem	Who	
	What	
	Where	
	When	
	Why	
	How	
Solution	Attempted Solutions	Results
	1.	1.
	2.	2.
End Results		

Name _____

Discovery Log

Inventor _____

Question you are researching (Testable Question) _____

Materials _____

Procedure _____

Conclusion _____

Discovery _____

Make a sketch of your experiment: