



# Texas School for the Blind and Visually Impaired

## Instructional Resources Library

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### Super Science: Forms of Energy

**Age(s) / Grade Level(s):** Elementary

**Subject(s):** Science

**Length of time:** 45 minutes

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#### TEKS or IEP Goals

112.16.2 The student uses scientific practices during laboratory and outdoor investigations. The student is expected to:

- (A) describe, plan, and implement simple experimental investigations testing one variable.
- (B) ask well-defined questions, formulate testable hypotheses, and select and use appropriate equipment and technology.
- (C) collect and record information using detailed observations and accurate measuring.
- (D) analyze and interpret information to construct reasonable explanations from direct (observable) and indirect (inferred) evidence.
- (E) demonstrate that repeated investigations may increase the reliability of results.
- (F) communicate valid conclusions in both written and verbal forms.

112.16.6 The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to:

- (A) explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy.

#### Objectives

Students will:

- Increase knowledge of chemical energy as a form of stored energy in atoms and molecules.
- Increase knowledge of the structure of an atom and how energy is released during chemical change.
- Strengthen ability to follow the scientific method through hands-on investigation.

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- Practice identifying and testing variables in an experiment.

### Materials/Accommodations Needed (consider students who are Emergent Bilingual)

- Quart-sized plastic Ziploc bag (1 per student or pair)
- Alka-Seltzer tablets (2 per student or pair)
- Cup or bowl of water
- Tablespoon
- Paper towels (for cleanup)
- Safety goggles (recommended)
- Sentence stems for observations (e.g., “I observed \_\_\_\_,” “The bag changed by \_\_\_\_”)
- Word bank (chemical energy, atom, molecule, variable, reaction, carbon dioxide) displayed with visuals
- Option for students to draw their observations instead of writing

### Lesson/Activity Sequence

#### Engage / Warm-Up

- Welcome students back and ask: *Would you rather ride in a hot air balloon or stay home and bake brownies?*
- Connect their responses: both examples involve energy transformations (heat, gas, etc.).
- Introduce today’s focus: chemical energy.

#### Introduce Key Concept

1. Ask: What do you already know about chemical energy? Chart student responses.
2. Explain: “Chemical energy is potential energy stored in atoms and molecules. It is released during a chemical change.”
3. Show a short video clip on chemical changes.
4. Investigation / Explore (15–20 min):
  - a. Review safety expectations.
5. Walk students through the procedure:
  - a. Put 2 tablespoons of water into the Ziploc bag. Keep the zipper dry.
  - b. Zip the bag halfway.
  - c. With dry hands, drop 2 Alka-Seltzer tablets into the bag and quickly zip it shut.
  - d. Gently shake to mix and observe.
  - e. Encourage multiple ways of noticing: look, listen, touch the bag’s surface.
  - f. Students record or draw observations.

#### Explain/Discuss

Ask guiding questions:

- What did you observe?
- What do you think happened in the bag?

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- Teacher explanation: The tablets contain aspirin, citric acid, and baking soda. The citric acid dissolves and reacts with the baking soda, producing carbon dioxide gas, which causes the bag to inflate. This is a chemical reaction and a chemical change.

### *Extend/Variables*

- Introduce the concept of a variable.
- Ask: If we tried this again, what could we change? (e.g., water temperature, number of tablets, amount of water).
- Students brainstorm one testable variable.

### *Connect to Real Life*

- Ask: What are some examples of chemical energy in our lives? (burning wood, gasoline, cooking, digestion).
- Students turn-and-talk, then share with class.

### *Closure (5 min)*

- Each student identifies one thing they learned or found most interesting.
- Use sentence frames to support responses: "I learned that \_\_\_\_." "I was surprised that \_\_\_\_."
- Assessment of Student Progress:
- Ongoing questioning during activity to check for understanding.
- Observation of student participation and ability to follow procedure.
- Written or drawn observations of the investigation.
- Exit slip or short quiz with questions such as:
- What is chemical energy?
- What gas caused the bag to puff up?
- Give one example of chemical energy in everyday life.
- What is a variable?

### **General notes/comments/reflections after lesson**

- How well did students grasp the concept of chemical energy?
- Did students demonstrate the ability to identify variables?
- Were the supports sufficient for emergent bilinguals?
- Adjust pacing for future lessons if needed.

### **Next steps/lesson**

- Repeat the Alka-Seltzer investigation with different variables (e.g., hot vs. cold water) to reinforce controlled experiments.
- Transition into exploring forms of energy more broadly (mechanical, light, thermal, electrical, sound).
- Introduce energy transformations (e.g., chemical → thermal → mechanical in cooking or driving a car).

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