

Dear Parent,

Your child is beginning a unit developed by the Battle Creek Area Mathematics and Science Center. This unit was designed to promote science and engineering literacy and integrate reading and writing skills into high-interest science content. During the next twelve weeks, your child will be actively involved with the fifth-grade *Structure and Properties of Matter* unit. This unit is geared for fifth-grade students and focuses on the big ideas of obtaining information to determine that all matter is made up of particles that are too small to be seen and that the particles can be rearranged to create new substances. Students will:

- Develop and use models that demonstrate how matter is made up of particles too small to be seen.
- Plan and carry out investigations that provide evidence that when two or more substances are mixed, a new substance with different properties can result.
- Plan and carry out an investigation that provides evidence that the total weight of matter is conserved even when a substance appears to have vanished.
- Plan and carry out an investigation that provides evidence that sugar still is present when dissolved in water.
- Develop and use a model to demonstrate what happens when a substance dissolves.
- Plan and carry out investigations into phase change and the cause and effect of temperature change on phases of matter.
- Measure and graph quantities of matter.
- Construct explanations based on evidence from investigations and text.

Fifth-grade students are also encouraged to think and act like scientists and engineers and begin to develop observation and communication skills in science.

1. Ask questions that can be investigated and use evidence to predict outcomes based on patterns.
2. Make observations to produce data.
3. Plan and conduct simple investigations.
4. Use evidence to construct explanations.
5. Obtain and combine information from resources to explain phenomena.
6. Develop a model using an analogy, example, or abstract representation to describe a scientific principle.
7. Use patterns in data and cause-and-effect relationships to explain change.
8. Use relevant scientific concepts and research findings to solve an engineering problem.

In this unit the activities are geared to build on their inherent knowledge and provide experiences that students use to apply their knowledge in a wider range of tasks. Students will be given the opportunity to explore, investigate, and develop models of particles that make up matter. They will read and explore how scientists and engineers use information to solve problems. Suggestions for activities to do at home are included with this letter. These activities will reinforce the concepts taught during this unit instruction.

May you enjoy quality time with your child while discussing the concepts involved with the *Structure and Properties of Matter* unit. Let us know if we may be of assistance.

The Outreach Staff

Battle Creek Area Mathematics and Science Center

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# ACTIVITIES TO DO AT HOME

## Activities To Do At Home

1. Your student will be observing and recording the properties of various objects and substances. Ask him/her to observe and describe the following properties: color, size, shape, weight, texture, flexibility, smell, and whether it sinks or floats. Identify the objects as matter and ask your student to tell you the state of matter the object is (solid, liquid, or gas) and how they know that.
2. Play a game with your student. Have him/her choose an object in the room or house, without telling you what it is. He/she will describe it, using properties, and you guess what it is. Reverse roles.
3. When cooking or baking, include your student in measuring out the quantities of ingredients necessary for your recipe. Show him/her the correct way to measure and let him/her practice. Use measuring tapes and rulers to measure objects found around the house.
4. Give your child an opportunity to investigate freezing different liquids and melting different solids. He/she will be doing a melting investigation in this unit. Place five different liquids in the freezer and see which liquid freezes the fastest and what information that tells them about the freezing point of the liquids. Your child may also be interested in the melting that occurs as the frozen solids become liquids.
5. Your child will be learning how to "distill" liquids by making a simple solar still, using the sun to evaporate the water in a mixture. A cup is sealed in a plastic baggie, which is placed for a period of time in a window. The water evaporates into water vapor and then condenses as water inside the baggie. The drops of water collect at the bottom of the baggie, and any other substances in the mixture remain in the cup. Allow your child to set up a solar still at home using different solutions for separation. Make daily observations with him/her. Can you see the water level in the cup changing? What else do you observe?
6. Your child will be doing some experiments demonstrating how air (and gases) have weight and take up space. These use simple materials available in most homes. All you need is a container (a see-through container is best) and a sink or bathtub of water. Ask your child to show you the evidence of how air takes up space.
7. Take a trip to the library with your child. Look for books about different types of matter and about measuring substances. Your librarian can help you locate these types of books.

Examples:

*States of Matter (Why Chemistry Matters)* by Lynnette Brent

*What Do You Know About States of Matter?* by Tilda Monroe

*The Science of a Glass of Water* by Anna Claybourne

*Change It! Solids, Liquids, Gases, and You* by Adrienne Mason