GRADE 1: THE WORLD OF MATTER

PROJECT CONN-CEPT

Connecticut State Department of Education
165 Capitol Avenue Hartford CT 06145
http://www.state.ct.us/sde/

Supported by a Javits Grant
US Department of Education

Project CONN-CEPT Science Units

Astronomy: Sun, Moon, and Stars (K-2)
The World of Matter (1)
Living Things: Changes, Stages and Cycles (2-3)
Eurekas and Ecosystems (4-5)
Light: A Rainbow of Exploration (4-5)
Sound's Story: H-Ear the Pitch (4-5)
Structure and Function: What's Their Junction? (6)
Weather: The Never-Ending Story (6)
Cells: The Story of Life (7)
Reactions and Interactions (7-8)

Project CONN-CEPT Social Studies Units

Time, Change, and Continuity in History (K)
Local Government (3)
What Makes a Region? An Investigation of the Northeast (4)
Goods, Services, Resources, Scarcity and Systems: An Exploration of State Economics (4-5)
Concepts and Tools of the Geographer (6)
With Liberty and Justice for All: A Study of the U.S. Constitution (6-8)

Units in Preparation

Junior Economist: People, Resources, Trade (1-2)
A Habitat is a Home for Plants and Animals: Needs, Resources, Adaptation and Systems (1-2)
May the Force be With You, Forces, Motion and Simple Machines (2-3)
Comparing Cultures: Traditions, Dwellings, Language, and Cultural Evolution (2-3)
Peopling of the Americas (4-5)
Going to the Source: Using Primary Resources in United States History (6-8)
Exploring the World's Oceans: Chemistry, Geology and Biology (7)
Reactions and Interactions: Chemical Reactions (7-8)

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A Shared Story

The exhibit hall was huge, and publishers' banners, suspended from the ceiling, waved back and forth in the air conditioned room. Hundreds of conference participants filled the aisles. Vendors of curriculum materials, eager to share their colorful and glossy wares with passing teachers and administrators, stood at the edge of their displays offering warm smiles, prizes, and publishers' catalogues.

Charlene and Andrew had carefully planned their tour through the aisles and divided up so that they could see all the materials. They looked forward to their time in the vendor area because they needed curriculum materials in social studies and science for their upper elementary and middle school students. They hoped they would find something good. They wanted coherent, comprehensive units that addressed their state and national standards, had good assessments, required students to think their way through content, provided teachers with teaching strategies, and some guidance regarding how to differentiate the curriculum for students with varied learning needs.

They looked at many cleverly designed curriculum packages and kits. Most materials were collections of episodic learning activities. Some contained coherent learning activities for students, but did not teach to the critical concepts and principles embedded in state and national standards. Other materials, claiming to be comprehensive, did not contain aligned pre- and post-assessments, user-friendly teacher information, suggestions for teaching, or techniques for differentiating. Several kits attended to concepts and principles, but none was comprehensive enough to address all the standards for a particular grade level. At least two kits would be required to cover the prerequisite standards. Worse, the cost for the two kits would not include the price for the consumables that would have to be purchased each year to keep the kits adequately stocked. They could hardly pay for the cost of one kit!

Charlene and Andrew met at the back of the hall and compared notes. They were disappointed because they realized that the high-quality, standards-based curriculum materials they wanted were not in the racks. Now what? Were there other vendors? If so, who were they and how could they be contacted? If there were no vendors with the materials they needed, could they write the needed curriculum themselves? Who could help them? Did the district have money to pay stipends for curriculum development? How could they possibly write all the curricula that was required to address the state assessments?

We dedicate this curriculum unit, as well as others written under this Javits grant, to all the teachers who have had experiences like Charlene and Andrew. We hope the unit presented here will meet the needs of educators who live in real classrooms, contend with real time constraints, prepare students adequately for high-stakes assessments, seek high-quality curriculum materials, and strive to meet the varied learning needs of all their students.

Deborah E. Burns
Jeanne H. Purcell

PREFACE

In 2002, the Connecticut State Department of Education was awarded a Javits grant from the U.S. Department of Education called Project CONN-CEPT. The major focus of grant activities was the creation of standards-based curriculum units, K-8, in science and social studies. These rigorous curriculum units have been created for all students because every child must have access to the highest quality curriculum. At the same time, the units also have a particular focus on the needs of advanced learners—those who know more, learn more rapidly, think more deeply, or who are more innovative in a particular area of study. It was our goal to embed learning opportunities for advanced learners that were tightly aligned with the concepts and principles that guided the unit.

The Parallel Curriculum Model

This standards-based curriculum unit has been designed using the *Parallel Curriculum Model* (PCM) (Tomlinson, Kaplan, Renzulli, Purcell, Leppien, & Burns, 2002). The *Parallel Curriculum Model* is a set of four interrelated designs that can be used singly, or in combination, to create or revise existing curriculum units, lessons, or tasks. Each of the four parallels offers a unique approach for organizing content, teaching, and learning that is closely aligned to the special purpose of each parallel. The four parallels include: the Core Curriculum Parallel, the Curriculum of Practice, the Curriculum of Connections, and the Curriculum of Identity.

The *Core Curriculum* addresses the core concepts, principles, and skills of a discipline. It is designed to help students understand essential, discipline-based content through the use of representative topics, inductive teaching, and analytic learning activities. The *Curriculum of Connections* builds upon the Core Curriculum. It is a plan that includes a set of guidelines and procedures to help curriculum developers connect overarching concepts, principles, and skills within and across disciplines, time periods, cultures, places, and/or events. This parallel is designed to help students understand overarching concepts, such as change, conflict, cause and effect, and patterns, as they relate to new content and content areas. The *Curriculum of Practice* is a plan that includes a set of guidelines and procedures to help students understand, use, generalize, and transfer essential knowledge, understandings, and skills in a field to authentic questions, practices, and problems. This parallel is designed to help students function with increasing skill and competency as a researcher, creator, producer, problem solver, or practitioner in a field. The *Curriculum of Identity* is a plan that includes a set of guidelines and procedures to assist students in reflecting upon the relationship between the skills and ideas in a discipline and their own lives, personal growth, and development. This parallel is designed to help students explore and participate in a discipline or field as it relates to their own interests, goals, and strengths, both now and in the future.

The *Parallel Curriculum Model* also contains a new concept called Ascending Intellectual Demand (AID). Ascending Intellectual Demand offers practitioners a way to think about a discipline and each student's steady, progressive movement from novice to expert within that discipline. As students are ready, teachers ask students for increasing levels of cognition, affect, and application. As such, AID is a framework teachers use to increase the challenge level for students by asking them to behave and act in expert-like ways. (Tomlinson, Kaplan, Purcell, Leppien, Burns, & Strickland, 2006).

This unit has been designed using the Core Curriculum parallel. Core Curriculum addresses the essential concepts, principles, generalizations, and skills of a subject area. It is designed to help students understand essential, discipline-based content through the use of representative topics, inductive teaching, and analytic learning activities. Although the majority of lessons in this unit have been designed using the Core Curriculum parallel, it also contains several lessons that provide students with opportunities to explore other parallels that are closely connected to the subject matter.

Our Invitation...

We invite you to peruse and implement this curriculum unit. We believe the use of this unit will be enhanced to the extent that you:

- **Study PCM**. Read the original book, as well as other companion volumes, including *The Parallel Curriculum in the Classroom: Units for Application Across the Content Areas, K-12 and The Parallel Curriculum in the Classroom: Essays for Application Across the Content Areas, K-12*. By studying the model in depth, teachers and administrators will have a clear sense of its goals and purposes.
- **Join us on our continuing journey to refine these curriculum units.** We know better than to suggest that these units are scripts for total success in the classroom. They are, at best, our most thoughtful thinking to date. They are solid evidence that we need to persevere. In small collaborative and reflective teams of practitioners, we invite you to field test these units and make your own refinements.
- **Raise questions about curriculum materials.** Provocative, compelling and pioneering questions about the quality of curriculum material—and their incumbent learning opportunities—are absolutely essential. Persistent and thoughtful questioning will lead us to the development of strenuous learning opportunities that will contribute to our students' life-long success in the 21st century.
- **Compare the units with material developed using other curriculum models.** Through such comparisons, we are better able to make decisions about the use of the model and its related curriculum materials for addressing the unique needs of diverse learners.
- **Examine PCM as one bridge between general and gifted education.** We believe that the rigorousness of PCM has much to offer *all* students, not just those who may be already know, do, or understand at very different levels of sophistication.

ACKNOWLEDGEMENTS

We would like to thank our mentors, Carol Tomlinson and Carolyn Callahan. They have been our constant supporters and guides as we moved into uncharted territory related to curriculum development and differentiation.

Over the years we have been guided by the wise counsel of our curriculum writers: Cheryll Adams, Renee Alister, Karen Berk, Fie Budzinsky, Meagan Bulger, Yvette Cain, Lori Cipollini, Leslie Chislett, Megan Coffey, Edie Doherty, Claire Farley, Kurt Haste, Carla Hill, MaryAnn Iadarolla, Caitlin Johnson, Megan Lamontagne, Donna Leake, Lisa Malina, Kay Rasmussen, Martha Rouleau, Cindy Strickland, Mary Grace Stewart, Kim Turret, Ann Marie Wintenberg, and Karen Zaleski. They have worked tirelessly on their curriculum units and provided us with many insights into the curriculum writing process. Although we had a road map at the outset of the writing process, our writers helped us to craft new roads when the old ones no longer worked. We thank them for their integrity, care, innovativeness, and encouragement.

We thank all of the people who featured into the field testing process. These people include teachers in Cheshire, Hartford and Portland Public Schools. We especially want to thank the following building administrators who supported our work: Tory Niles and John Laverty from Hartford; Linda Cahill and Deborah Granier from Portland; and Steve Proffitt, Diane DiPietro, Sharon Weirsman, Russ Hinkley, Beverly Scully, and Mary Karas from Cheshire. The insights from teachers and administrators helped to make our curriculum units stronger and more practical.

Kim Allen, from Project LEARN, provided us with assistance and support in all of our endeavors and made sure that we stayed the course in solid financial standing. Nancy Wight and Gail Heigel, from Cheshire Public Schools, spent untold hours formatting, typing, duplicating, collating, and distributing the experimental units and ordering the numerous student materials and teacher resources that supplement these lessons. They are the masters of due diligence and attention to detail. We also wish to thank Eileen Williams and Patricia Johnson, from the State Department of Education, for formatting, typing, and preparing the pre-assessments and post assessments for the units. They worked tirelessly for many hours after work and on weekends to meet our deadlines and never lost their smiles.

We thank Cheshire Public Schools and the Connecticut State Department of Education for allowing us to take on this tremendous task and allowing us the hours within day (and night) to accomplish all that was required.

Our families and friends deserve special recognition because they offered unwavering support and encouragement. We recognize they made personal sacrifices, and we hope that we have grown as a result.

Most of all, we would like to thank Judy Walsh on whose shoulders these units truly stand. With the greatest of care and unparalleled thoughtfulness and consideration, Judy has edited each manuscript, worked collaboratively with each author to refine each lesson, written lessons when it was necessary, and provided a sense of humor and her wisdom as a teacher. She is selfless and seeks only to advance each author and the project. In every way, she has been our "North Star" on the project.

Format for the Project CONN-CEPT Curriculum Units

Each Project CONN-CEPT curriculum unit is formatted in the same way and contains four components: an overview, the lessons, a content map, and a comprehensive list of resources required in the unit. The *overview* is a chart that includes the lesson principles, concepts and skills, the time allocation, the standards that are explicitly addressed within each lesson, and a brief description of each lesson. The overview provides potential users with a "snap-shot" of the unit, related standards, and classroom activities.

The *lessons* follow the overview and vary in number depending upon the content area and grade level of the unit. Each lesson is comprehensive and addresses 10 curriculum components: content, assessments, introductory and debriefing activities, teaching strategies, learning activities, grouping strategies, products, resources, extensions, and differentiation activities. For the most part, each lesson provides specific *information* about each of these components. An aligned pre- and post-assessment is included for the entire unit, and aligned formative assessments are provided at critical junctures in the unit. Additionally, each lesson contains all the required black-line masters and materials.

Many lessons contain two features that are unique to Project CONN-CEPT materials: opportunities for Ascending Intellectual Demands (AID) and talent-spotting activities. Ascending Intellectual Demand is a term used to describe learning opportunities that require students to work at increasing levels of discipline-specific expertise (Tomlinson et al). They are appropriate for any student who demonstrates advanced ability or expertise in a discipline. The AID opportunities are labeled using the acronym AID. Additionally, many lessons contain searchlight opportunities. Searchlight opportunities are rich moments during a lesson for teachers to observe students and note those who appear to have heightened interest in the topic under investigation. To support these students' emerging interests, extension ideas are provided.

A *content map* comes after the lessons. Like the overview, the content chart is a snap-shot of the important knowledge in a unit: the major and minor principles, concepts, skills, themes and guiding questions. Teachers who want in-depth information about the knowledge contained in the unit will find this chart useful.

A comprehensive list of *resource materials* concludes each unit. Although the required materials are also listed at the beginning of each lesson, the comprehensive listing provides teachers with a one-page summary of all the materials and it facilitates planning.

Introduction to The World of Matter – Grade 1

This unit on the world of matter has been designed using the Core Curriculum parallel. Core Curriculum addresses the essential concepts, principles, generalizations, and skills of a subject area. It is designed to help students understand essential, discipline-based content through the use of representative topics, inductive teaching, and analytic learning activities. Although the majority of lessons in this unit have been designed using the Core Curriculum parallel, it also contains several lessons that provide primary grade students with opportunities to explore the Curriculum of Connections through intradisciplinary and interdisciplinary connections. In addition there are two lessons that provides grade one students with the opportunity to explore the methodology of the practicing professional, Curriculum of Practice.

The unit contains eight lessons as well as a pre-assessment session and a post assessment session that are outlined in the chart below. The first column contains the lesson number and the name of the parallel(s) that the lesson addresses. The second column contains a series of numbers. The numbers reflect the national standards—culled from *National Science Education Standards* (NSES) (National Research Council, 1996) and *Benchmarks for Science Literacy* (BSL) (American Association for the Advancement of Science, 1993)—that are addressed in each lesson and that are listed and numbered below. Connecticut's standards are also referenced here and are cited in the same column. For brevity's sake, only one or two standards are listed in each row of the chart and represent the major focus of individual sessions. However, the lessons have been designed to build upon each other, and each session builds iteratively upon many of the standards.

Column three contains the principles that guide the lesson. The principles—which state relationships among essential concepts—reflect what we want students to know and be able to do upon completing the lessons. They are derived from the standards, reflect both declarative and procedural knowledge, and illustrate the careful attention that has been given to "teasing apart" the complexity of ideas contained within standard statements.

Column four includes a brief description of the lesson. It provides an overview of some of the teaching and learning activities that are designed to occur within the classroom.

National Standards

Physical Science

1. Objects are made of one or more materials, such as paper, wood, and metal. Objects can be described by the properties of the materials from which they are made, and those properties can be used to separate or sort a group of objects or materials. (*National Science Education Standards*, K-4)
2. Materials can exist in different states—solid, liquid, and gas. Some common materials, such as water, can be changed from one state to another by heating or cooling. (NSES*, K-4)
3. Objects can be described in terms of the materials they are made of (clay, cloth, paper, etc.) and their physical properties (color, size, shape, weight, texture, flexibility, etc.). (*Benchmarks for Science Literacy*, K-2)
4. Things can be done to materials to change some of their properties, but not all materials respond the same way to what is done to them. (BSL**, K-2)

The Designed World

5. Some kinds of materials are better than others for making any particular thing. Materials that are better in some ways (such as stronger or cheaper) may be worse in other ways (heavier or harder to cut). (BSL, K-2)

Habits of Mind

6. By the end of the 2nd grade, students should describe and compare things in terms of number, shape, texture, size, weight, color, and motion. (BSL, K-2)
7. By the end of the 2nd grade, students should draw pictures that correctly portray at least some features of the thing being described. (BSL, K-2)
8. By the end of the 2nd grade, students should raise questions about the world around them and be willing to seek answers to some of them by making careful observations and trying things out. (BSL, K-2)

Science as Inquiry

9. Scientific investigations involve asking and answering a question and comparing the answer with what scientists already know about the world. (NSES, K-4)
10. Scientists use different kinds of investigations depending on the questions they are trying to answer. Types of investigations include describing objects, events, and organisms; classifying them; and doing a fair test (experimenting). (NSES, Science as Inquiry, K-4)
11. Simple instruments, such as magnifiers, thermometers, and rulers, provide more information than scientists obtain using only their senses. (NSES, Science as Inquiry, K-4)
12. Scientists develop explanations using observations (evidence) and what they already know about the world (scientific knowledge). Good explanations are based on evidence from investigations. (NSES, Science as Inquiry, K-4)

The Nature of Science

13. Everybody can do science and invent things and ideas. (BSL, K-2)

14. In doing science, it is often helpful to work with a team and to share findings with others. All team members should reach their own individual conclusions, however, about what the findings mean. (BSL, K-2)

* National Research Council. (1996). *National science education standards*. Washington, DC: National Academy Press.
** American Association for the Advancement of Science. (1993). *Project 2061: Benchmarks for science literacy*. New York: Oxford University Press

Connecticut Related Content Standards
Grades PreK-2

I Scientific Inquiry (Expected Performances A INQ. 1, A INQ. 2, A INQ. 3)
Scientific inquiry is a thoughtful and coordinated attempt to search out, describe, explain and predict natural phenomena.

Scientific Literacy (Expected Performances A INQ. 4, A INQ. 5, A. INQ. 6)
Scientific literacy includes speaking, listening, presenting, interpreting, reading and writing about science.

Scientific Numeracy (Expected Performances A INQ. 7, A INQ. 8, A INQ. 9, A INQ. 10)
Mathematics provides useful tools for the description, analysis and presentation of scientific data and ideas.

PreK-Kindergarten

K.1 Properties of Matter (Expected Performances – A 1, A 3)

How does the structure of matter affect the properties and uses of materials?
Objects have properties that can be observed and used to describe similarities and differences.

- Some properties can be observed with the senses, and others can be discovered by using simple tools or tests.

Grade 2

2.1 Properties of Matter (Expected Performances – A 18)

How does the structure of matter affect the properties and uses of materials?
Materials can be classified as solid, liquid or gas based on their observable properties.

- Solids tend to maintain their own shapes, while liquids tend to assume the shapes of their containers, and gases fill their containers fully.

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Module & Lessons	Standards	Lesson Principles	Lesson Description
Pre-assessment (CORE) 1 hour			This lesson includes a pre-assessment that samples the content of this unit: the meaning of matter, the properties of matter, the three states of matter, the composition of matter, and the ways in which matter reacts to changes in temperature.
Module 1 (CORE/ PRACTICE/ AID) 1 hour, 30 minutes	6, 7, 13, 14 CT Standards: I (Expected Performances: A INQ. 1, 2, 3, 4, 6)	• The world of science is explored and investigated by scientists. • Children can be scientists.	Students are introduced to the study of science in this module. Using their senses of hearing, smelling, and feeling, they will gather evidence about a mystery object in a bag. Students then confer with a partner to come up with a decision about what they think the object is and draw a picture of it. After sharing their pictures, evidence, and the actual objects with the class, children begin to understand what a scientist does as he/she explores and investigates science and realize that they were acting as scientists. An extension activity provides students with input from an actual scientist, and an AID activity invites students with advanced ability to further investigate using their senses.
Module 2 (PRACTICE/ CONNECTIONS/ AID) 1 hour	9, 12 CT Standards: I (Expected Performances: A INQ. 1, 3 (AID) A INQ. 7, 10)	• The word *matter* has more than one meaning • Words that sound the same often have different meanings.	In this module students begin by exploring the idea that some words have more than one meaning. They focus on the different meanings for the word *matter* which will lead to the meaning of matter that will be used in the unit, which is anything that takes up space and has mass. An AID opportunity invites advanced students to weigh solid objects using a pan balance and gram weights and then make a bar graph of the objects from the least to greatest amount of mass.
Module 3 (CORE) 2 hours	7, 8, 14 CT Standards: I (Expected Performances: A INQ. 1, 3, 6,)	• Matter is anything that takes up space and has mass. • Living and non-living objects are made up of matter.	Students focus on the concept that matter is anything that takes up space and has mass. Furthermore, they learn that both living and non-living objects are made of matter. As part of their study, students go on a scavenger hunt in their classroom to find one piece of matter. After some discussion about matter, students make a representational drawing of an object made of matter, explain why it is made of matter, and tape it on the bulletin board for display.

Module & Lessons	Standards	Lesson Principles	Lesson Description
Module 4 Lessons 1-5 (CORE) 3 hours, 10 minutes	3, 6, 10, 11 CT Standards: I (Expected Performances: A INQ. 1, 2, 3, 4, 6, 7, 8) K.1 (Expected Performances: A 1)	• All matter has properties. • Properties can be used to describe matter.	The first lesson focuses on describing the properties of matter by color. Partners will examine various objects and then describe their colors for the class on the Properties of Matter Word Chart In the second and third lessons, partners again examine various objects and describe them for the class by using size words and shape words. After reviewing shape words, partners examine various objects and describe them for the class using shape words in the third lesson. Student partners discover the meaning of the word *texture* in the fourth lesson and then use texture words to describe various objects. In the fifth lesson students learn that weight is a measure of how heavy an object is. Using a pan-balance to weigh a crayon and a rock, groups of four then weigh two objects and record their findings by using weight property words An extension activity invites pairs of students to describe an object in a bag by using various property words.
Module 5 Lessons 1-2 (CORE/ CONNECTIONS/ AID) 1 hour, 30 minutes	1, 10, 12 CT Standards: I (Expected Performances: A INQ. 1, 2, 3, 4, 9) K 1 (Expected Performances: A 1, A 3)	• Matter can be categorized by its properties. • Categorizing creates an order that makes understanding easier.	In the first lesson student partners receive a bag of various objects with a variety of colors, sizes, shapes, textures, and weights. They decide together on a way to sort the objects. After sharing with the class, students continue to sort their objects in as many different ways as they can. The second lesson asks pairs of students to find the number of each color of tiles in a large bag. Students see that sorting the tiles by color makes it easier to count them. An AID activity invites advanced students to sort pattern blocks by two similar characteristics.

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Module	Standards	Lesson Principles	Lesson Description
Module 6 Lessons 1-3 (CORE/ CONNECTIONS) 2 hours, 30 minutes	2, 3, 6, 10 CT Standards: I (Expected Performances – A INQ. 1, 2, 3, 4, 5, 6, 7, 8) 2. 1 (Expected Performances – A 18)	• Matter occurs in three commonly recognized states: solid, liquid and gas. • Each state of matter has unique characteristics. • Matter can be measured.	After a pre-assessment activity in which students draw pictures of a solid, a liquid, and a gas, the first lesson introduces them to solids. They measure a crayon and a piece of cloth and then perform a series of experiments on them and determine that solids keep their size and shape unless you do something to change them. In second lesson students learn more about the properties of liquids when they pour water from one container to another and back again. They determine that liquids do not keep their shape but do keep their size. Lesson three focuses on the properties of gases. Partners experiment with a balloon half- filled with air and realize that gases do not keep their shape or their size. An extension activity invites students to experiment with mixing two liquids together and two solids together. After completing the mixing, students realize that solids that are mixed together can be separated, but liquids cannot.

Module	Standards	Lesson Principles	Lesson Description
Module 7 Lessons 1-2 (CORE/ CONNECTIONS) 2 hours, 35 minutes	2, 4, 10, 11 CT Standards: I (Expected Performances – (A INQ. 1, 2, 3, 4, 6, 7) 2.1 (Expected Performances – A 18)	• Changes in states of matter generally result from changes in temperature.	After an introductory activity which introduces students to the thermometer and its use, the first lesson in this module engages pairs in an experiment where they observe solid matter changing into liquid matter and learn the concept of melting. The second lesson involves a lab where pairs of students observe liquid matter evaporate over a period of five days. Students then analyze what it was that caused the matter to change from one state to another and realize that it is heat.
Module 8 (CORE) 1 hour, 30 minutes	1, 5 CT Standard: I (Expected Performances – A INQ. 1, 2, 3, 4, 5, 6, 9)	• Matter is made from different materials.	In this module students learn about the different kinds of materials that can make up matter. They explore why objects are made from certain materials and how that composition affects the use of the object.
Post Assessment (CORE) 1 hour		All principles in the unit	Post Assessment

Reference

American Association for the Advancement of Science. (1993). *Project 2061: Benchmarks for science literacy.* New York: Oxford University Press.

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Tomlinson, C. A., Kaplan, S. N., Renzulli, J. S., Purcell, J., Leppien, J., & Burns, D. (2002). *The parallel curriculum: A design to develop high potential and challenge high-ability learners*. Thousand Oaks, CA: Corwin Press.

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“Pre-assessment”

Pre-assessment

Core

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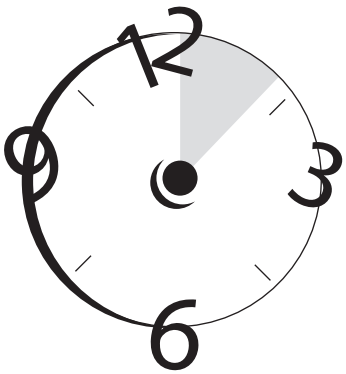


Lesson Overview

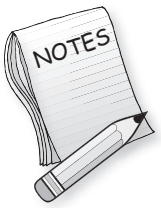
Students take the pre-assessment for the entire class today.

Guiding Questions

- What do I know about solid matter?
- What do I know about liquid matter?
- What do I know about gaseous matter?

BIG IDEA

What Do I Know About Matter?



Universal Themes

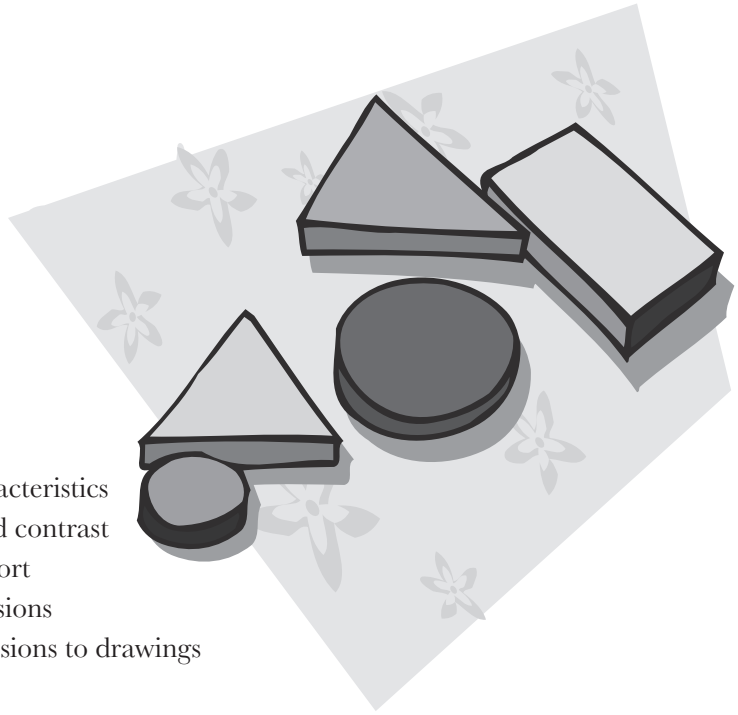
- Evidence, Models, and Explanation

Principles and Generalizations

- Matter is anything that takes up space and has mass.
- All matter has properties.
- Matter can be categorized by its properties.
- Matter occurs in three commonly recognized states: solid, liquid and gas.
- Changes in states of matter generally result from changes in temperature.
- Matter is made from different materials.

Concepts

- Senses
- Evidence
- Matter
- Space
- Mass
- Properties
- Color
- Shape
- Size
- Texture
- Weight
- Categorize/sort
- Compare
- Contrast
- Same
- Different
- Solid
- Liquid
- Gas
- Measurement
- Matter
- Material
- Wood



- Metal
- Plastic

Teacher Information
N/A

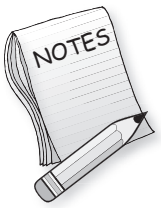
Skills
- Identify characteristics
- Compare and contrast
- Categorize/sort
- Draw conclusions
- Apply conclusions to drawings

Materials and Resources
1. Ten to twelve objects of a variety of shapes, colors, sizes, textures and weights
2. **BLM Pre-assessment: Part 2**
3. Crayons

Preparation Activities
1. Place objects in a plastic bag for each student.
2. Observe whether or not students know how to sort.
3. Monitor this assignment more easily by setting up two to four stations in different areas of the classroom with materials and have one student to a station as the rest of the class is working on another assignment. Continue in this way until all students have completed the assessment at one station.
4. Copy **BLM Pre-assessment: Part 2** for each student

Introductory Activities (2 minutes)
Explain to students that the activity they will be doing today will be used by you as a tool to measure their previous knowledge.

Pre-assessment
Properties and States of Matter Unit Pre-assessment



Teaching and Learning Activities – Part 1 (38 minutes)

1. Give students the following instructions:
   - Take the objects out of the bag.
   - Sort these objects in some way.
   - Show your teacher how you sorted the objects.
   - Tell your teacher why you sorted the objects that way.

Teaching and Learning Activities – Part II (20 minutes)

1. Distribute a copy of **BLM Pre-Assestsment: Part 2** to each student
2. Ask students to take out crayons.
3. Have students point to Box 1-Solids.
4. Tell students to draw a picture of solid matter in Box 1.
5. Be sure students understand that it's okay if they cannot draw a picture of a solid.
6. Continue in this way for Box 2-Liquids and Box 3-Gases.
7. Collect and review their work.

Products and Assignments

Students' assessment results

Extension Activities

N/A

Post Assessment

N/A

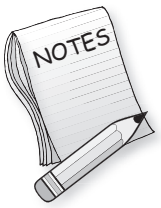
Debriefing and Reflection Opportunities

N/A

BLM Pre-assessment: Part 2

Name: _____

1. Solids	2. Liquids
3. Gases	



Rubric for Pre-assessment Part 1

3 The student was able to sort the objects into two or more groups and accurately explained the rule for sorting the objects.

2 The student was able to sort the objects into groups and but expressed some hesitation when explaining the rule for sorting the objects.

1 The student sorted the objects into groups but was unable to explain the rule for sorting.

0 The student demonstrated a lack of understanding of how to sort objects.

Rubric for Pre-Assessment Part 2

3 The student was able to draw a picture of a solid, of a liquid and of a gas in the appropriate boxes.

2 The student was able to draw a picture of two of the required pictures in the appropriate boxes.

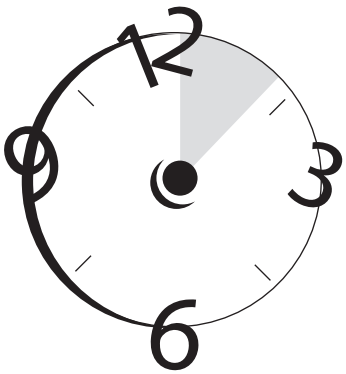
1 The student was able to draw a picture of one of the required pictures in the appropriate box.

0 The student was not able to draw a picture of a solid, of a liquid or of a gas in the appropriate boxes.

The World of Science

Core/Practice/AID

Time Allocation: 1 hour, 30 minutes
Required Materials and Resources on Page 110



Lesson Overview

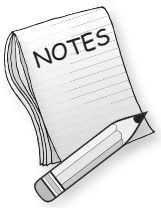
In this module students will be introduced to the study of science. They will begin to understand what a scientist does as he/she explores and investigates science. Additionally, students will learn that they can be scientists. After a brief discussion of what science is and what scientists do, students will participate in an activity where an object, placed in a sock or bag so as to be hidden from view, will be given to each group of students. They will be asked to use their senses, except for sight and taste, to infer what is in the sock (bag) and then draw a picture of it. Students will gather as a group to share their pictures with the class and the reasons for their inferences. This module addresses the following principle: The world of science is explored and investigated by scientists; as well as its corresponding minor principle: Children can be scientists.

Guiding Questions

- What is science?
- What does a scientist do?
- How can children be scientists?
- Would you like to be a scientist?

BIG IDEA

Exploring Science Like a Scientist



Content Goals

Universal Themes

Evidence, Models and Explanation

Principles and Generalizations

- The world of science is explored and investigated by scientists.
- Children can be scientists.

Concepts

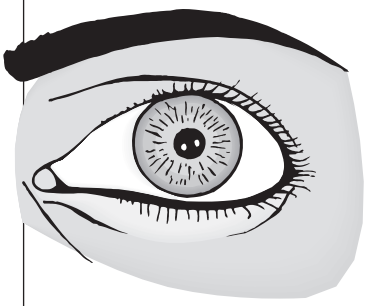
- Science
- Scientist
- Senses
- Evidence

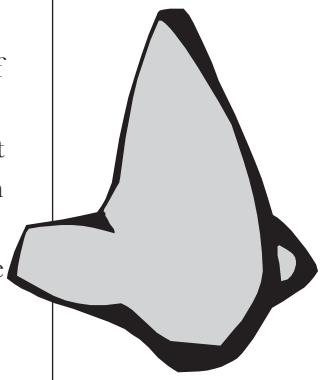
Teacher Information

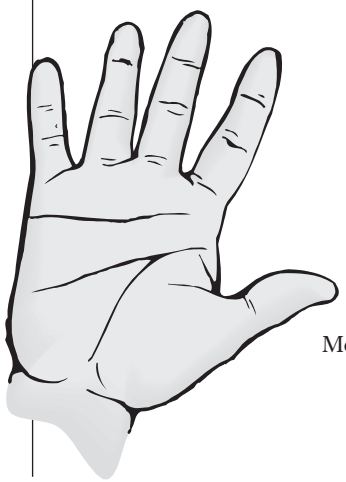
- The study of science is the pursuit of any system of knowledge concerned with the physical world.
- The study of science engages scientists in unbiased observation and systematic experimentation.
  Scientists are people who are curious about our world of nature and want to study, learn, explore, and investigate it to find out answers to questions and solve problems they or others encounter.
- Observing is the use of senses to learn about objects and events in the environment.
- Inferring is to conclude from evidence or derive a conclusion from facts.
- Evidence is the information gathered from observations, experimentation, etc. that is used to make responsible predictions and to draw conclusions.
- Recording data refers to the recording of information derived from observations.
- Communicating data refers to a person's description of the perceptions of what that person observes.

Skills

- Observe
- Gather evidence







- Infer
- Communicate data
- Draw in a representational way

Materials and Resources

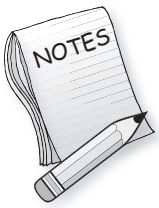
1. Images to represent the content of science
2. Images to represent some of the equipment and tools that scientists use to study science
3. Easel, chart paper, marker
4. Box with an object placed in it.
5. Adult socks: one for every two students or opaque lunch size bags: one for every two students.
6. A variety if objects, i.e. small balls – hard and soft, blocks, cotton, bottle cap, small piece of sponge, pen, coin, toy cars, toy animals, etc. Have enough different objects to place one in each sock or bag.
7. 9"x12" drawing paper
8. Pencils/crayons

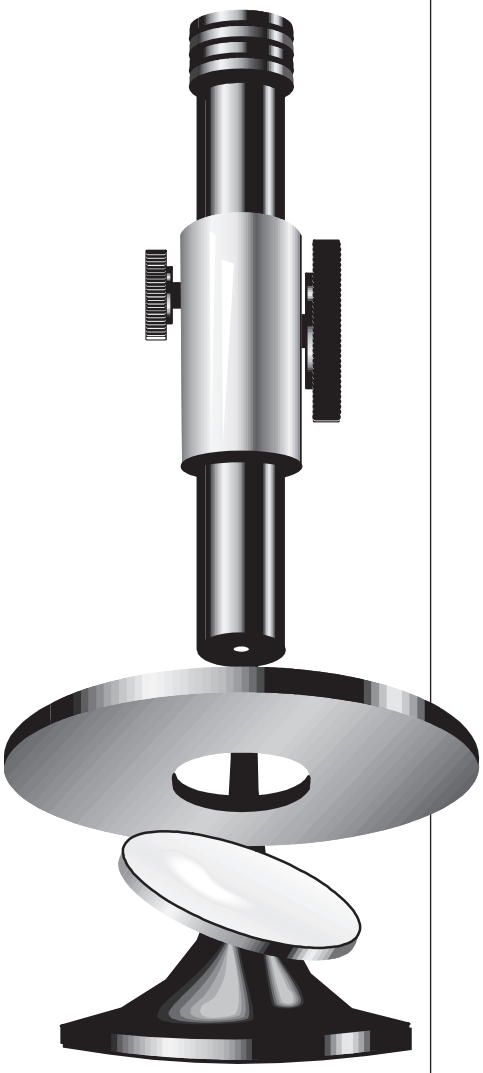
Preparation Activities

1. Prepare a piece of chart paper titled "What is Science?" Cut out pictures of nature and paste them on the chart.
2. Make up a piece of chart paper titled "How Scientists Study Science." Cut out the pictures of an eye, ear, nose and hand along with science tools such as microscopes, telescopes, etc.
3. Place tape on the back of each picture in preparation to tape them on the chart during discussion.
4. Position an object in a box and tape the box so that it will not open.
5. Gather 9" x 12" drawing paper for each student.
6. Place an object in each sock (bag) so as to have enough for each pair of students. Each sock (bag) should have a different object.

Introductory Activities (20 minutes)

- Gather entire class in a meeting area.
- Explain that they are going to do some "science" today.
- Ask students what they think science is. Call on students to share their thinking.





- Display the chart "What is Science?"
- Question students about what these pictures in nature have to do with science. Discuss responses and guide students to understand that science is studying nature and all that is a part of nature.
- Ask students what they think you mean by the word *scientist*. Guide them as they respond to keep them focused on the idea that scientists are people who are curious about our world of nature and want to study, learn, explore and investigate it to find out answers to questions they or others have.
- Display the chart "How Scientists Study Science" and ask students how they think scientists study science.
- Listen to responses. If a student mentions one of the senses, tape the picture of that sense on the chart paper and ask what else scientists might use to study science.
- If no one mentions any of the senses, tape one of the pictures of a sense on the chart and ask how a scientist might use that sense to study science. Proceed in this way until all the senses are discussed and students understand that scientists use their sense of sight, hearing, touch, smell, and taste to learn about our world.
- Explain that scientists often use tools to help them as they use their senses to study science.
- Elicit responses as to what tools they might use.
- Tape pictures of a microscope, telescope, Bunsen burner, computer and magnifying glass on the chart to enhance the discussion.
- Ask students how they think they could be scientists. Bring out the idea that when they are curious about an animal, insect, rock, etc. and study it to learn, they are scientists.
- **SEARCHLIGHT:** This is an opportunity for the teacher to look for students who ask elaborate questions or indicate that they have a great deal of science talent. They might be good candidates for extension activities.

Pre-assessment

N/A

Teaching and Learning Activities (60 Minutes)

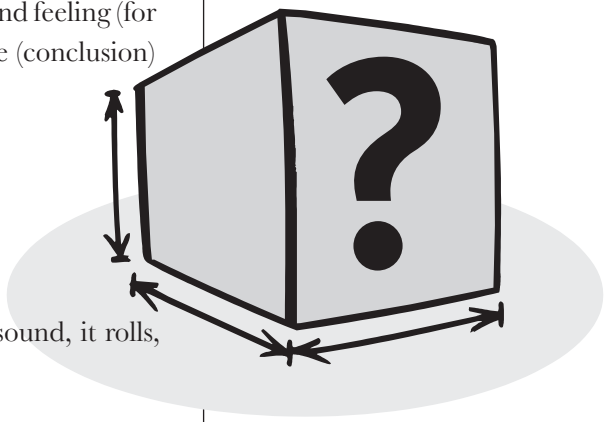
1. Have students gather in a meeting area and sit in a whole group circle arrangement.

2. Review the chart showing the meaning of science and the role of the scientist.

3. Explain that scientists sometimes work alone but often times work together. Say that today they are going to work together as scientists to try to solve a problem.

4. The problem is to determine what is in the mystery box.

5. As scientists, students will use their sense of hearing, smelling and feeling (for weight) to gather evidence so that they can make an inference (conclusion) as to what is in the box.



6. Have students listen as you shake the box.

7. Elicit responses as to what sound they hear.

8. Discuss and record their responses on chart paper. (i.e. loud sound, it rolls, etc.)

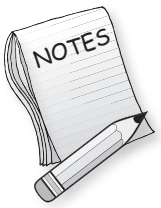
9. Pass the box around and have each child try to determine if it has an odor, and if it has weight. Record responses. Ask students if they have any other evidence that can help us decide (infer) what is in the box. Record responses.

10. Ask students what they think is in the box and the reasons (evidence) for their thoughts. (i.e., I think it's a bell because I can hear a ringing sound.)

11. After hearing from everyone, open the box and take out the object for all to see. Discuss the characteristics of the object and compare them to their responses.

12. Ask students how they were like a scientist. (i.e., They were using their senses to study and make inferences about their world.)

13. During the next activity, have students work in pairs to describe an object that has been placed in a sock or a bag.



14. Explain that students will use their senses except sight and taste to gather evidence so that they can make inferences as to what is in the sock or bag.

15. Have students sit in groups of two or no more than three if you have an odd number of students in your class.

16. Hold up two socks (bags) with an object in each.

17. Explain that you have placed a different object in each sock (bag) and that you have a sock (bag) for each pair or group of students.

18. Explain that as scientists, their job will be to infer what the object is in the sock (bag) they receive.

19. Explain that you have two rules:
    - o The object cannot be taken out of the sock (bag).
    - o They cannot look at the object with their eyes.

20. Ask how they think they can decide (infer) what is in the sock. Guide them to see that they can use some of their senses to touch and feel it, to listen to it and to smell it. Demonstrate this as well. Explain that by using their senses they will be gathering evidence that should help them decide what is in the sock (bag).

21. After you are sure that students understand what to do, explain that they will have 10 minutes to gather the evidence that will help them decide what is in the sock (bag).

22. Discuss ways for students to cooperate with their partners as they share their sock (bag), reminding them that scientists often have to cooperate with one another as they work on science projects such as this one.

23. After 10 minutes pass, ask students to take their hands out of the socks (bags) and place the sock (bag) in a corner of the desk.

24. Have them to talk with their partner and share their evidence.

25. Ask them to try to come up with an inference or decision as to what is in the sock (bag) and why. (Both partners do not have to agree.) They will have 5 minutes to decide.

26. After 5 minutes pass, ask students to draw a picture of what they think the object in the sock is. These pictures do not have to be elaborate. Inform students that they will have about 5 minutes to do this task.

27. When most of the students have finished their picture, ask them to bring their pictures and socks (bags) to the meeting area and sit with their partners.

28. Ask each pair of students to show their pictures and share why (evidence) they think the object is what they depicted in their drawing. (i.e., I thought it was a golf ball because it was small, hard and round.) Express your thoughts about the evidence.

29. After each pair shares their pictures and their evidence, they may take the object out of the sock (bag) and compare it to their drawing.

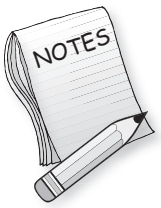
30. Continue in this way until all have shared their pictures, evidence, and the actual objects.

Products and Assignments

- Students' picture responses (what they think is in the sock or bag)
- Chart paper responses recorded by the teacher

Extension Activities

1. Invite a science professor from a nearby college or university or a scientist from a local company to visit your class and give a brief talk about how he or she became interested in scientific research. Explain that the children have acted as scientists in using their senses to explore objects. From the evidence they have collected, they have drawn conclusions. Ask him or her to tell the children how he or she uses those same skills in research.
2. (AID) Invite those children who have shown that they have an advanced knowledge of science to explore different and more sophisticated covered objects that you have prepared and to collect evidence, draw conclusions, and share their results with the class.



Post Assessment

N/A

Debriefing and Reflection Opportunities (10 minutes)

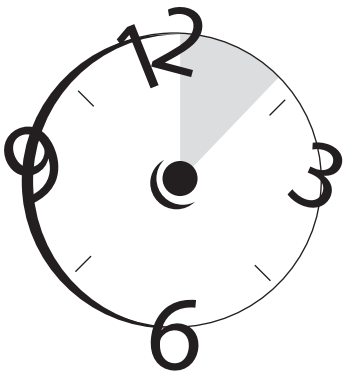
Following the teaching and learning activities, ask students to share their ideas concerning the following:

- What is science?
- How were you like a scientist in this activity?

Why does Matter Matter?

Practice/Connections/AID

Time Allocation: 1 Hour
Required Materials and Resources on Page 110



Lesson Overview

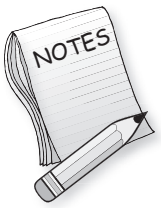
In this module, students will be introduced to the idea that some words can have more than one meaning. Students will focus on the different meanings for the word *matter*. This focus will lead into the meaning of matter that will be used in this lesson and throughout this unit. This module addresses the following principle: The word *matter* has more than one meaning; as well as its corresponding minor principle: Words that sound the same often have different meanings.

Guiding Questions

What does the word *matter* mean?

BIG IDEA

The Meaning of Matter



Content Goals

Universal Themes

Evidence, Models and Explanation

Principles and Generalizations

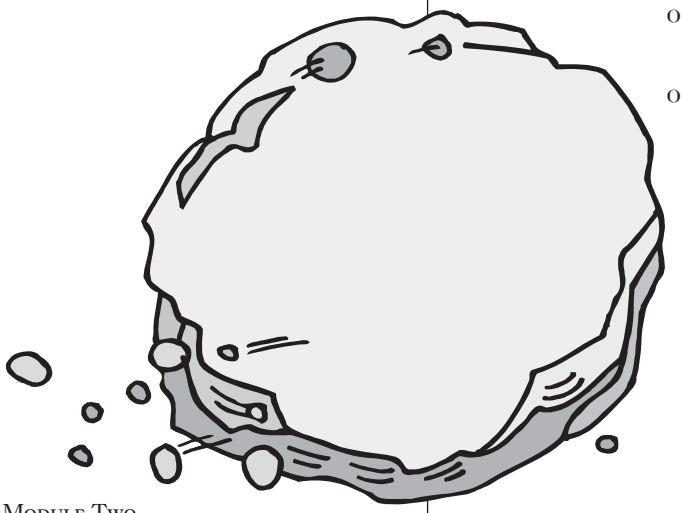
- The word *matter* has more than one meaning.
- Words that sound the same often have different meanings.

Concepts

- Matter
- Space
- Mass

Teacher Information

- Some words can have more than one meaning.
- *Matter* has more than one meaning.
- The meaning of matter that this module uses is as follows:
    - o Matter is anything that takes up space and has mass.
- When an object takes up space, it can be measured in some way.
- Mass is how much there is of an object. It is a measure of how much matter an object has.
- Mass is a property of matter.
- Mass and weight are different, but related quantities.
    - o An object's mass is a measure of its resistance to changes in motion (inertia).
    - o You can push a little rock more easily than a big rock because the big rock has a greater mass than the little rock. It is made up of more "stuff" than the little rock. The big rock also weighs more than the little rock in the earth's gravitational field. However, if you took both rocks into space, outside of any gravitational field where they are both weightless, the big rock would still be more resistant to a change in motion than the little rock because the big rock still has more mass than the little rock even though they are both weightless.



Skills

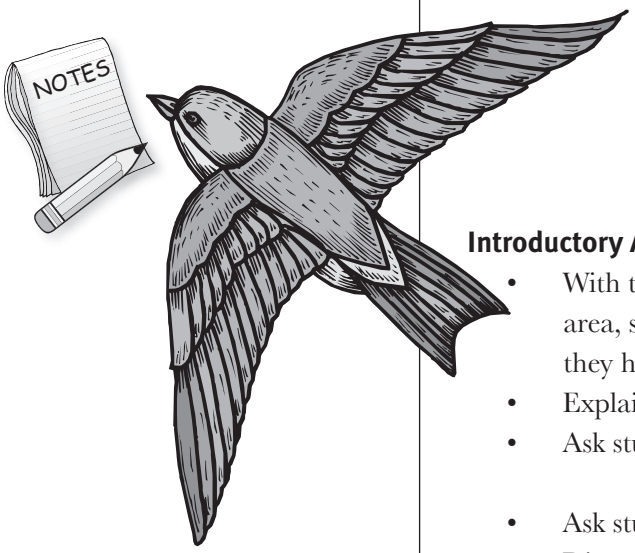
- Listen
- Infer
- Measure
- Record data

Materials and Resources

1. Fly pictures
2. **BLM2ii: Amount of Mass**
3. A book, some crayons, and a toy. (These objects may be substituted with other objects that are accessible in the classroom.)
4. Pictures that show the different meanings of words that have more than one meaning
5. Easel, chart paper, marker
6. Pan-balances for the AID extension activity
7. Gram weights for the AID extension activity
8. One-inch graph paper and crayons for AID extension activity

Preparation Activities

1. Find and prepare two pictures for the word *fly*. One picture should be a picture of a bird in flight. The other image should be of a house fly. If you do not have such images available, go to www.google.com , click on images and put in the names of the images you need.
2. Gather a book, some crayons, and a toy. (These objects may be substituted with other objects that are accessible in the classroom.)
3. Collect pictures that show the different meanings of words that have more than one meaning.
4. Prepare a piece of chart paper titled "Matter."
5. Copy **BLM2ii: Amount of Mass** and cut along the lines so each AID student has one section.
6. Have available a pan-balance for each group of four student for the AID extension activity.
7. Prepare enough gram weights for each group of four students for the AID extension activity.
8. Make available one-inch graph paper and crayons for each student for AID extension activity.



Introductory Activities (15 minutes)

- With the class in a whole group arrangement, sitting together in a meeting area, share with students the idea that some words are special because they have more than one meaning.
- Explain that the word *fly* has different meanings.
- Ask students to listen for the word *fly* in the following sentence:
    - o The *fly* landed on my nose.
- Ask students what *fly* means in that sentence. (an insect)
- Discuss the meaning of *fly* and show a picture of a *fly* to reinforce its meaning.
- Next, ask students what the word *fly* means in this sentence:
    - o The bird can *fly* in the sky.
- Discuss the meaning of *fly* in that sentence with students and show a picture of a bird flying.
- Explain that the word *fly* sounds the same in both sentences but means something different in each sentence.
- Repeat this exercise with other words such as *orange* or *bill*, or ask students if they know of any words that sound the same but have different meanings.
- Discuss the words and use them in sentences. Display pictures that demonstrate the meaning of the words in sentences.
    - o Words that sound the same but are spelled differently and have different meanings can also be used since the emphasis is not on different spellings of words. (i.e. to, two; so, sew; dear, deer; whole, hole; blue, blew; one, won)

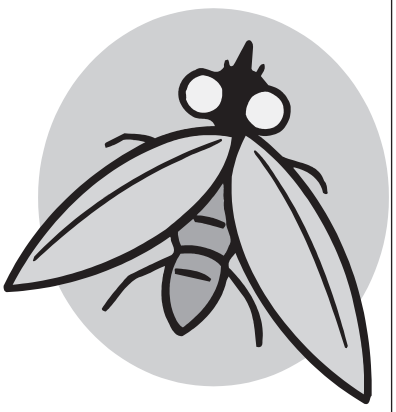
Pre-assessment

N/A

Teaching and Learning Activities (30 Minutes)

1. With the class in a whole group arrangement sitting in a circle on the floor, write the word *matter* in large letters on chart paper and read it to the class.

2. Ask if anyone can use the word *matter* in a sentence. (Students will probably use or understand *matter* as something that is being considered or needs to be dealt with.)



3. Use *matter* in a sentence if students are unable to, being sure to use the above definition for *matter* and discuss its meaning in the sentence. i.e. What's the *matter* with Bill?

4. Have volunteers share sentences using *matter*.

5. Explain that *matter* is another of these special words that have different meanings.

6. Tell students that today they are going to discover another meaning for the word *matter*.

7. Place a book, some crayons, and a toy, on the floor in the middle of the circle for all the children to see. (These objects may be substituted with other objects that are accessible in the classroom.)

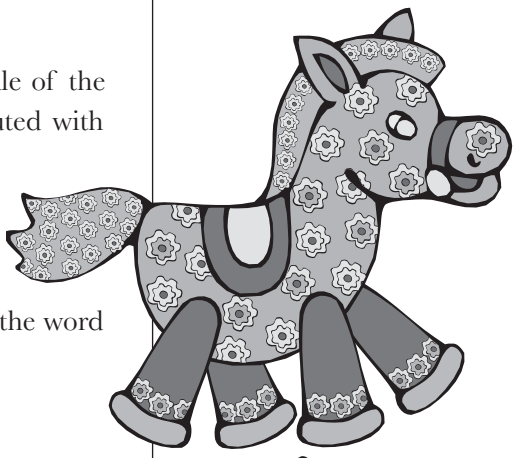
8. Have students name each object.

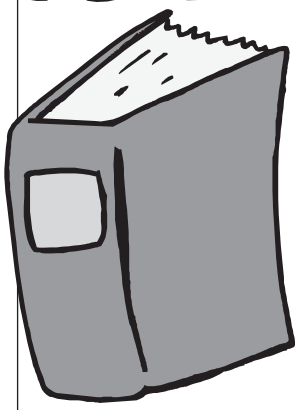
9. Remind students that they are going to find another meaning for the word *matter*.

10. Ask students the following questions about each object.
    - Does the book take up space? It does if it can be measured in some way. (Use standard or non-standard measurement to measure the book.)
    - Is the book made up of something? (mass) (AID)
        - o Explain that the word *mass* is another special word that has more than one meaning.
        - o Ask students for their definitions of the word *mass*.
        - o Explain that the *mass* of the book means that the book is made up of something.

11. Lead students to understand that anything that takes up space (can be measured) and has mass (is made up of something) is matter.

12. Ask the same questions about the crayons and the toy.





13. Summarize by saying that the objects in the circle are made of matter because they take up space and have mass.

Products and Assignments

- AID recording sheets (**BLM2ii: Amount of Mass**) and graph

Extension Activities (30 minutes)

- (AID) Suggest this opportunity to those students that you noticed in Module 1 who displayed a great deal of science talent.
- Have students work in pairs.
- Give each pair a solid object (i.e. small toy, book, crayon, etc.), gram weights and a pan balance.
- Explain that they will measure the amount of mass in the object they have by using the pan balance and the gram weights.
- After they measure the amount of mass of their object and record their results on the recording sheet, they are to get together as a group and share their data. (**BLM2ii: Amount of Mass**)
- After they share their data, they should each create a bar graph that shows the mass of each object from the least to the greatest amount of mass.
- Invite students to share their results with the class.

Post Assessment

N/A

Debriefing and Reflection Opportunities (15 minutes)

- Following the teaching and learning activities, ask students to think, pair, share on the following:
    - o Name something in the classroom that is made of matter.
    - o Share your idea with the class.
- SEARCHLIGHT: This is an opportunity for the teacher to watch for students who have a good understanding of matter.

Amount of Mass

Name of Object:_____

Amount of Mass_____ **grams**

Name of Object:_____

Amount of Mass:_____ **grams**

Name of Object:_____

Amount of Mass:_____ **grams**

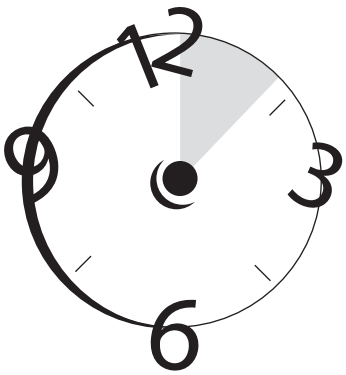
Name of Object:_____

Amount of Mass:_____ **grams**

Matter is Everywhere

Core

Time Allocation: 2 Hours
Required Materials and Resources on Page 110



Lesson Overview

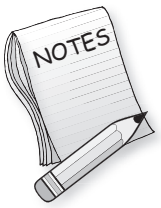
In this module, students will focus on the concept that matter is anything that takes up space and has mass. Furthermore, students will learn that both living and non-living objects are made up of matter. As a part of their study, students will go on a scavenger hunt in their classroom to find one piece of matter. Students will be challenged to name objects, both living and non-living, that are made of matter. After some discussion, students will make a representational drawing of an object made of matter and tape it to a chart or bulletin board for display. This module addresses the following principle: Matter is anything that takes up space and has mass; as well as its corresponding minor principle: Living and non-living objects are made up of matter.

Guiding Questions

- What is matter?
- Where can matter be found?
- What are objects made of?

BIG IDEA

All Living and Non-Living Objects Are Made of Matter



Content Goals

Universal Themes

Evidence, Models and Explanation

Principles and Generalizations

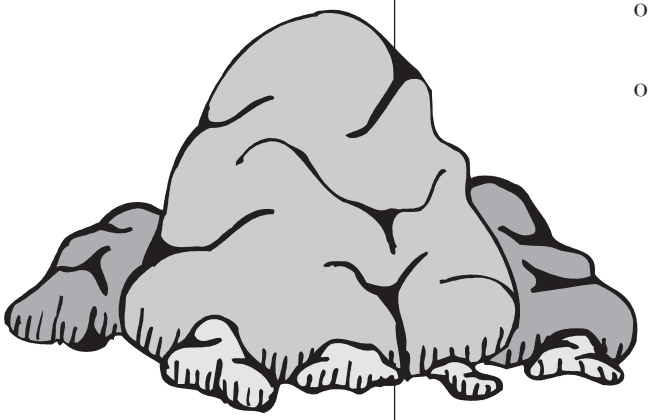
- Matter is anything that takes up space and has mass.
- Living and non-living objects are made up of matter.

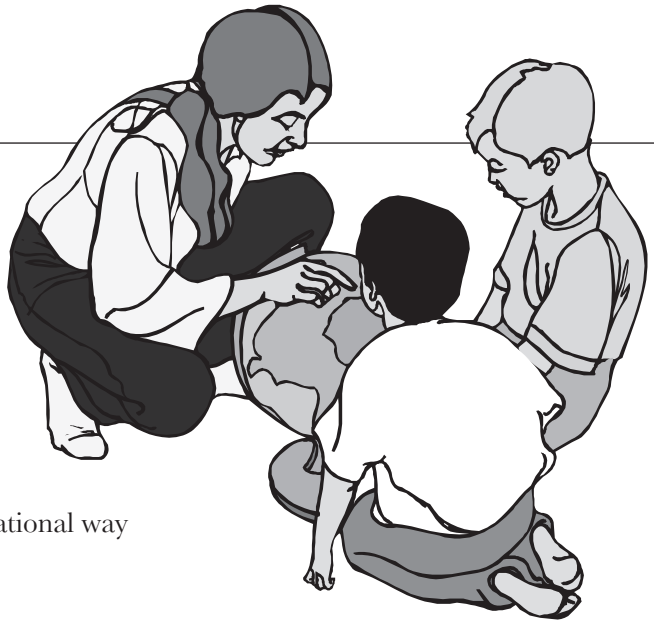
Concepts

- Matter
- Living and non-living objects
- Space
- Mass

Teacher Information

- Matter is anything that takes up space and has mass.
- When an object takes up space, it can be measured in some way.
- Mass is how much there is of an object. It is a measure of how much matter an object has.
- Mass is a property of matter.
- Mass and weight are different, but related quantities.
    - An object's mass is a measure of its resistance to changes in motion (inertia).
    - You can push a little rock more easily than a big rock because the big rock has a greater mass than the little rock. It is made up of more "stuff" than the little rock. The big rock also weighs more than the little rock in the earth's gravitational field. However, if you took both rocks into space, outside of any gravitational field where they are both weightless, the big rock would still be more resistant to a change in motion than the little rock because the big rock still has more mass than the little rock even though they are both weightless.
- Living objects include anything that is alive and not dead.
- Non-living objects include anything that is not alive.





Matter is Everywhere

Skills

- Infer
- Observe
- Draw in a representational way

Materials and Resources

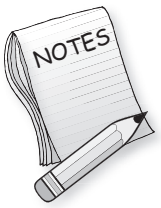
1. A poster or chart with various pictures of living and non-living objects
2. A book; a glass or plastic bottle of water; and an air-filled balloon
3. Easel, chart paper, marker
4. Drawing paper 9”x12” for each child
5. Crayons
6. Scissors
7. Tape
8. Construction paper 9” x 12” for each child

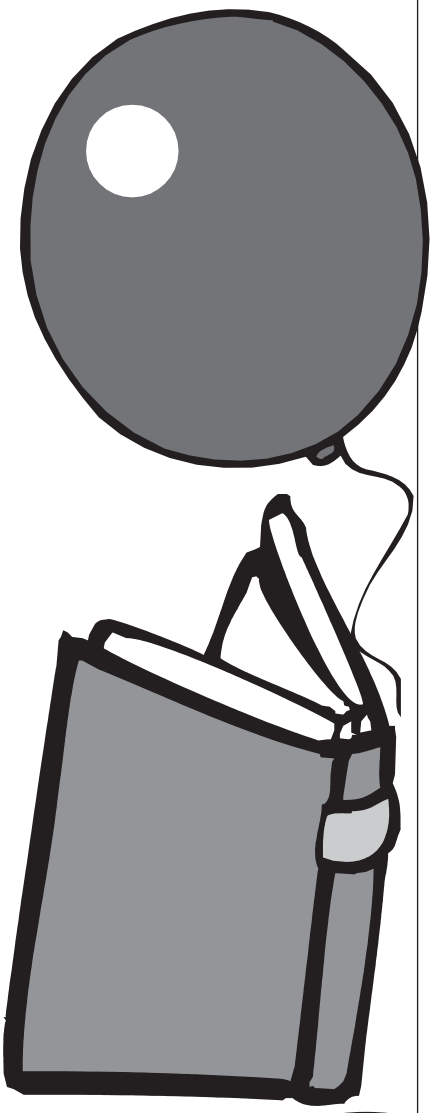
Preparation Activities

1. Prepare a chart with at least nine or ten pictures of living and non-living objects (furniture, pets, food, flowers, trees, clothing, children, etc.) Make a copy of the chart so that each student will have one for a pre and post assessment.
2. Collect a book, a glass or plastic bottle of water, and an air-filled balloon.
3. Prepare of chart paper titled “Matter.”
4. Tape a picture of a book, glass of water and air-filled balloon in separate columns on the Matter Chart.
5. Have available pictures of items in the classroom and outside of the classroom to tape on the Matter Chart if needed to support class discussion.
6. Gather 9” x 12” construction paper, crayons and scissors ready for use.
7. Place tape next to the Matter Chart.

Introductory Activities (15 minutes)

- Gather entire class in a whole group arrangement in a meeting area.
- Remind students about the discussion of matter in the previous science module.
- Hold up a book and ask students if the book takes up space? (yes)
- Ask students if the book is made of something? (yes)





- Remind them that the word *matter* means anything that takes up space and is made of something (has mass).

Pre-assessment (15 minutes)

- Pass out a copy of the matter chart with the nine or ten objects to each student.
- Ask students to draw a line under each object that is made of matter.
- Collect the papers.

Teaching and Learning Activities (1 hour)

1. Arrange students in a whole group arrangement, sitting in a circle in a meeting area.

2. Write the word *matter* on chart paper and display it for the group to see.

3. Place a book, a glass or plastic bottle of water, and an air-filled balloon on the floor in the middle of the circle for all the children to see.

4. Invite students to name each object.

5. Present the principle that matter is anything that takes up space and has mass.

6. Then ask if anyone can think of a way that the book, the water and the air in the balloon are the same.

7. Lead students to an understanding that the book, the water and the air in the balloon are all made up of matter because they each take up space and have mass. **SEARCHLIGHT**: This is an opportunity for the teacher to watch for students who have some understanding of matter.

8. Remind students that matter is anything that takes up space and has mass.

9. Explain what a scavenger hunt is and send students on a classroom scavenger hunt to fine one object made up of matter.

10. Explain that they are to take the object back to the sitting area to share with the group.

11. Instruct students to share their object and tell why they think it's made up of matter.

12. Have students return the objects and then return to the sitting area.

13. Challenge students to look around the classroom and name other items that are made of matter.

14. Elicit and discuss their responses. Emphasize that the items they mention are made of matter. (i.e. Yes, the table is made of matter. It takes up space and has mass.)

15. Then challenge students to think about the outdoors and to name items that are made of matter.

16. Elicit and discuss their responses.

17. Ask questions that will lead to responses children may not initially give such as rain, clouds, and air.

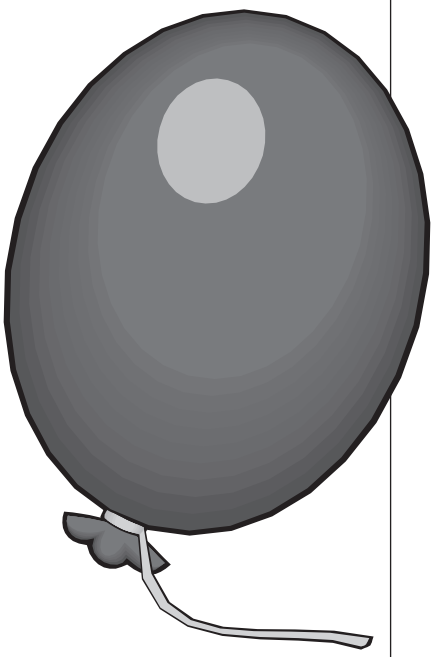
18. If students have not named living objects, ask them the following question: If everything in the world is made of matter, then are living objects such as trees and people made of matter?

19. Discuss responses and lead students to understand that both living and non-living objects are made of matter.

20. Ask students if they are taking up space where they are sitting.

21. Ask them if they are made of something (mass).

22. Help them to understand that if they take up space and are made of something, then they are made of matter.



23. Invite students cite other examples of matter.

24. Now, ask students if air takes up space.

25. Ask students to place a hand on their chest.

26. Have them take a deep breath of air and hold their breath for a second.

27. Then have them let out the breath and ask them if the air took up space in their lungs? (You may have to explain what lungs are and do for the body.)

28. Show the class a deflated balloon.

29. Have them watch as you blow air into the balloon.

30. Ask:
    - o Is the air taking up space in the balloon?
    - o Is the air made of something? Does it have mass?

31. Explain to the class that the air takes up space because the balloon got bigger when air was blown into it.

32. Also explain that air has mass (is made of something) even though they don't see it, and because the air takes up space and has mass, it is matter.

33. Have students return to their work areas and give them the following directions:
    - o Think of an object that is made up of matter.
    - o Draw a picture of the object.
    - o Color it and cut it out.

34. Pass out 9 x 12 inch construction paper, crayons and scissors for this activity.

35. When most students have completed the task, ask them to gather with their cut out picture of an object made of matter around the Matter Chart.

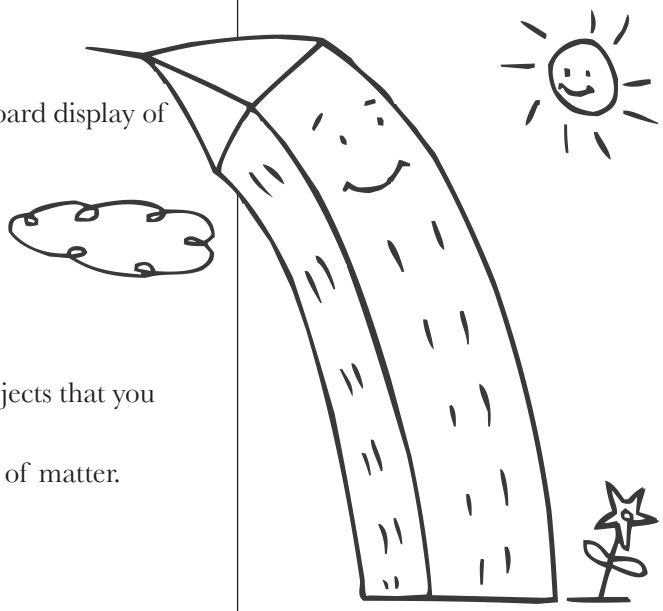
36. Have each child share his/her drawing, name it and explain why it is made of matter. (It takes up space and has mass.)

37. Take each picture and tape it on the Matter Chart or bulletin board for display.

38. Invite students to bring in drawings or pictures of matter throughout the unit of study.

Products and Assignments

- Pre and Post-Assessment using matter chart
- Student drawn pictures of matter
- Matter chart with matter pictures taped on it or bulletin board display of student pictures.



Extension Activities

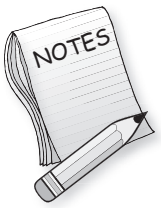
N/A

Post Assessment (15 minutes)

- Pass out a copy of the matter chart with the nine or ten objects that you used for the pre-assessment to each student.
- Ask students to draw a line under each object that is made of matter.
- Collect papers and determine needs of students.

Debriefing and Reflection Opportunities (15 minutes)

1. Following the teaching and learning activities, ask students to think, pair, share thoughts on the following:
    - What is matter?
    - Name one living object made up of matter.
    - Name one non-living object made up of matter.
2. Have students share their responses with the class.



Pre and Post Assessment Rubric

3 The student underlined all objects demonstrating an understanding that all objects are made of matter.

2 The student underlined some objects demonstrating some understanding that all objects are made of matter.

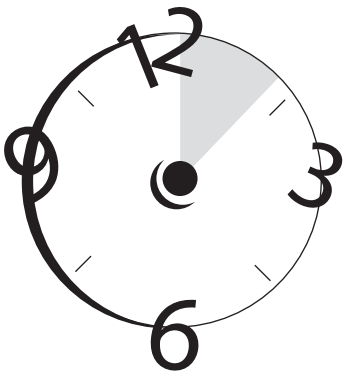
1 The student underlined few objects demonstrating little understanding that all objects are made of matter.

0 The student may have underlined objects but demonstrated a lack of understanding that all objects are made of matter.

The Properties of Matter

Core

Time Allocation: 3 Hours, 10 Minutes
Required Materials and Resources on Page 110



Lesson Overview

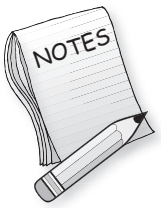
In this module students will learn about the properties of matter and how those properties can be described. Students will work in pairs observing and manipulating a variety of objects as they determine the properties of those objects. Children will explore words that describe color, size, shape, texture, and weight as tools to describe properties. This module addresses the following principle: All matter has properties; as well as its corresponding minor principle: Properties can be used to describe matter.

Guiding Questions

- What are the properties of matter?
- How can the properties of matter be described?

BIG IDEA

Properties of Matter



Content Goals

Universal Themes

Systems, Order and Organization

Principles and Generalizations

- All matter has properties.
- Properties can be used to describe matter.

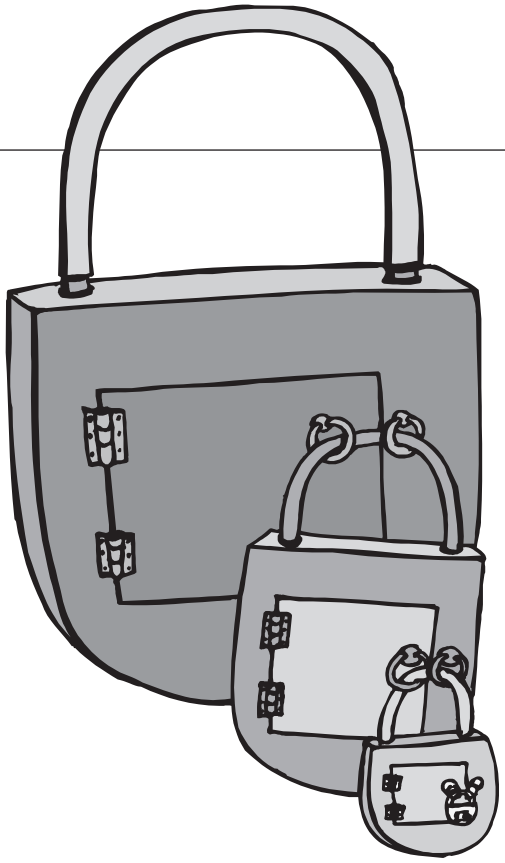
Concepts

- Matter
- Properties
- Color
- Shape
- Size
- Texture
- Weight

Teacher Information

- Matter is anything that takes up space and has mass.
- A property is a quality or trait that is characteristic of a person or object. A property is any quality that serves to describe or define an object, material or relationship.
- A property can also be an effect that a material or substance has on another object or on one or more of the senses.
- Some of the properties of matter include color, shape, size, texture, and weight.
- Color is the property of objects that depends on the light that they reflect and that is perceived as red, blue, green or other shades.
- Shape is the outline of something's form, a geometric form such as a square, triangle, etc.
- Size is the amount, scope, or degree of something, in terms of how large or small it is.
- Texture is the feel and appearance of a surface, especially how rough or smooth it is.
- Weight is the heaviness of somebody or something.

The Properties of Matter



Skills

- Observe
- Infer
- Gather data
- Record data
- Communicate data

Materials and Resources

Introduction

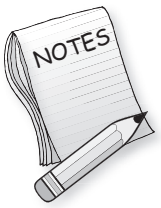
1. One yellow pencil
2. One playground ball

Lesson 1

1. **Properties of Matter Word Chart** (see **BLM4i: Properties of Matter Word Chart**) and marker
2. One playground ball (Another object can be substituted if a playground ball is not available.)
3. One plastic bag for each group of two students
4. Five or six objects of various colors (i.e. blocks, balloons, buttons, marbles, shells, plastic spoons, corks, feathers, rocks, rubber bands, coarse sandpaper, etc.) for each group of two students
5. White construction paper 12" x 18" for each group of two students

Lesson 2

1. One large playground ball, one tennis ball, one marble
2. **Properties of Matter Word Chart**
3. Marker
4. One plastic bag for each group of two students
5. Five or six objects of various sizes (i.e. blocks, balloons, buttons, marbles, shells, plastic spoons, corks, feathers, rocks, rubber bands, coarse sandpaper, etc.) for each group of two students
6. White construction paper 12" x 18" for each pair of students
7. Common shapes for display



Lesson 3

1. **Properties of Matter Word Chart**
2. Marker
3. One plastic bag for each group of two students
4. Five or six objects of various shapes for each group of two students
5. White construction paper 12" x 18" for each pair of students

Lesson 4

1. **Properties of Matter Word Chart**
2. Marker
3. One plastic bag for each group of two students
4. Five or six objects of various textures for each group of two students (Include a block, cotton, sandpaper, a rough rock, a smooth rock, and other textures.)
5. White construction paper 12" x 18" for each pair of students

Lesson 5

1. **Properties of Matter Word Chart**
2. Marker
3. One rock, one crayon, one pair of scissors
4. One pan-balance for each group of four students
5. One plastic bag for each group of four students
6. Objects of various weights for each group of four students
7. **BLM4ii: Weight**

Extension Activity

1. Opaque bag – one for each pair of students
2. Two to three different objects for each bag of various sizes, shapes, textures and weights

Preparation Activities

Introduction

Have available a yellow pencil and a playground ball.

Lesson 1

1. Prepare, on large chart paper, a **Properties of Matter Word Chart**. See **BLM4i: Properties of Matter Word Chart**.

2. Get a marker to record responses on the chart.
3. Have available one playground ball. (Another object can be substituted if a playground ball is not available.)
4. Place five or six objects of various colors in a plastic bag for each group of two students.
5. Gather 12 x 18 inch white construction paper, one piece for each group of two students.

Lesson 2

1. Obtain one large playground ball, one tennis ball and one marble.
2. Display the **Properties of Matter Word Chart** from Lesson 1.
3. Get a marker to record responses on the chart.
4. Place five or six objects of various sizes in a plastic bag for each group of two students.
5. Gather 12 x 18 inch white construction paper, one piece for each group of two students.
6. Assemble common shapes for display (i.e., square, circle, triangle, etc.).

Lesson 3

1. Display the **Properties of Matter Word Chart** from Lesson 2.
2. Get a marker to record responses on the chart.
3. Place five or six objects of various shapes in a plastic bag for each group of two students.
4. Gather 12 x 18 inch white construction paper, one piece for each group of two students.

Lesson 4

1. Display the **Properties of Matter Word Chart** from Lesson 3.
2. Get a marker to record responses on the chart.
3. Place five or six objects in a plastic bag for each group of two students. (Include a block, cotton, sandpaper, a rough rock, a smooth rock, and other textures.)
4. Gather 12 x 18 inch white construction paper, one piece for each for each group of two students.

Lesson 5

1. Display the **Properties of Matter Word Chart** from Lesson 4.
2. Get a marker to record responses on the chart.
3. Gather a rock, a crayon, a pair of scissors and a pan-balance.
4. Have ready a pan-balance for each group of four students.
5. Place two objects, one heavier than the other, in a plastic bag for each group of four students.
6. Copy **BLM4ii: Weight** so that each student has several copies for recording data.

Extension Activity

The teacher should prepare and have ready enough opaque bags for each pair of students with two to three different objects of various sizes, shapes, textures or weights in each bag.

Introductory Activities (10 minutes)

- Assemble students in a whole group arrangement, sitting in a meeting area and then hold up a yellow pencil for all to see and say:
  - o I own this pencil. It's my property.
- Ask students what they think the word *property* means.
- Lead students to understand that the word *property* as it was used means something owned.
- Explain that the word *property* is another of those special words that has different meanings. Let them know that they will discover another meaning for property.

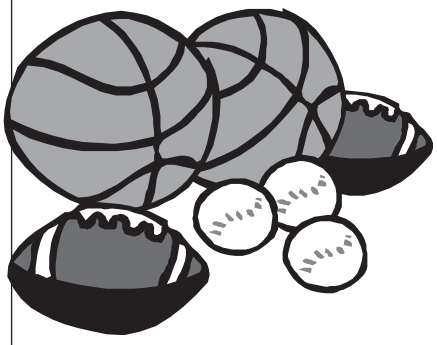
Pre-assessment (5 minutes)

- With students in a whole group arrangement and sitting in a meeting area, hold up a playground ball and ask students the following questions:
  o What are the properties of this ball?
  o Elicit responses without commenting on them.

Teaching and Learning Activities (2 hours and 30 minutes)

Lesson 1

1. With students in a whole group arrangement and sitting in a meeting area, display the **Properties of Matter Word Chart** (see **BLM4i:**



Properties of Matter Word Chart) and read the words on the chart to the class.

2. Hold up the playground ball again and ask how they know this ball is made of matter.

3. Guide students to understand that the ball takes up space and has mass.

4. If they show uncertainties in their responses, then ask the following question:
   • What color is this ball?

5. Elicit a response for color and record the word under the Color Words column on the **Properties of Matter Word Chart**.

6. Continue in this way with the following questions recording responses under the appropriate column on the chart.
   • What shape is the ball?
   • What size is the ball?
   • How does the ball feel? (Have some students feel the ball.)
   • Is the ball light or heavy? (Have some students hold the ball.)

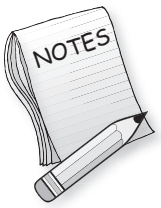
7. After recording student responses to the questions on the chart, read the description of the ball to the class.

8. Explain that those words describe the ***properties*** of the ball.

9. Explain that property words describe or make a picture of an object. Some of the things they describe are color, shape, size, texture and weight of an object.

10. Have students sit with a partner at desks or tables.

11. Explain that each pair of students will receive a plastic bag filled with various objects and a 12 x 18 inch piece of white construction paper.

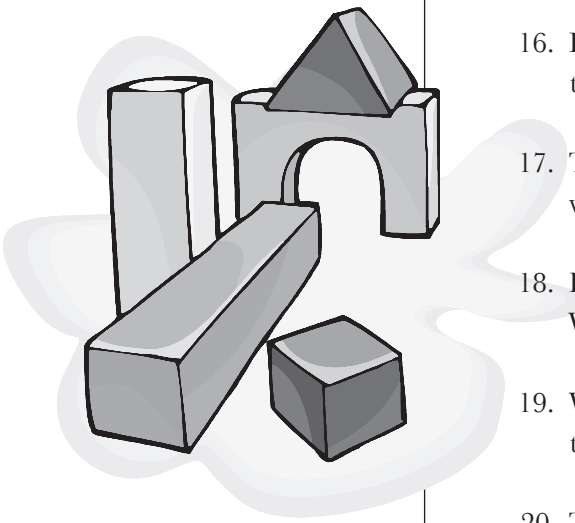


12. Explain that they will be looking at the objects and deciding on property words that can be used to describe the objects.

13. Distribute the plastic bag of objects and construction paper to each pair of students.

14. Have students place each of the objects on the construction paper, which will serve as their workspace.

15. Allow time for students to observe and manipulate the objects.



16. Determine that all the objects are made up of matter by asking if the objects take up space and have mass.

17. Then have students look at the objects on their workspace and ask them what colors they see.

18. Explain that you will record their responses on the Properties of Matter Word Chart under color words.

19. When students finish with their responses, point to and read each word on the list under color.

20. Then ask is there are any other color words that can be added to the list.

21. Record responses on the chart under color words.

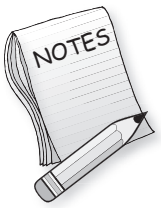
22. Remind students that the objects are made up of matter and that all matter can be described by its properties.

23. Summarize by asking students what color property words they used to describe the objects on their workspaces.

24. Collect materials.

Lesson 2

1. With the class in a whole group arrangement sitting in a circle in a gathering area, place a large playground ball, a tennis ball and a marble in the center of the circle.
2. Display the **Properties of Matter Word Chart** from Lesson 1 so students can see it.
3. Determine that the playground ball, the tennis ball and the marble are made up of matter by asking if the objects take up space and have mass.
4. Explain to students that they are going to describe the size of the objects they see in the center of the circle.
5. Talk about the size of each in comparison to one another. Use words such as large, small, big, little, medium and record the words on the word chart.
6. Have students look around the room and describe the objects they see using size words.
7. Record size words on the **Properties of Matter Word Chart**.
8. Next have students return to their seats at their desks or tables and arrange them in groups of two students each.
9. Explain to the class that each group of students will receive a plastic bag filled with various objects and a 12 x 18 inch piece of white construction paper.
10. Tell them that when they receive their materials, they should take the objects out of the bag and place them on the construction paper, which is their workspace.
11. Distribute materials and allow time for students to set up their workspace.
12. Determine that all the objects are made up of matter by asking if the objects take up space and have mass.



13. Ask students to look at the objects on their workspace and describe the sizes they see.

14. Point to the size words on the chart as they share their words and add any size words that are not listed.

15. Remind students that the objects are made up of matter and that all matter can be described by its properties.

16. Summarize by asking students to name the size property words they used to describe the objects on their workspaces.

17. Collect materials

Lesson 3

1. Arrange the class into groups of two students each.

2. Display the **Properties of Matter Word Chart** from Lesson 2.

3. Ask students if they can name any color property words, then any size property words.

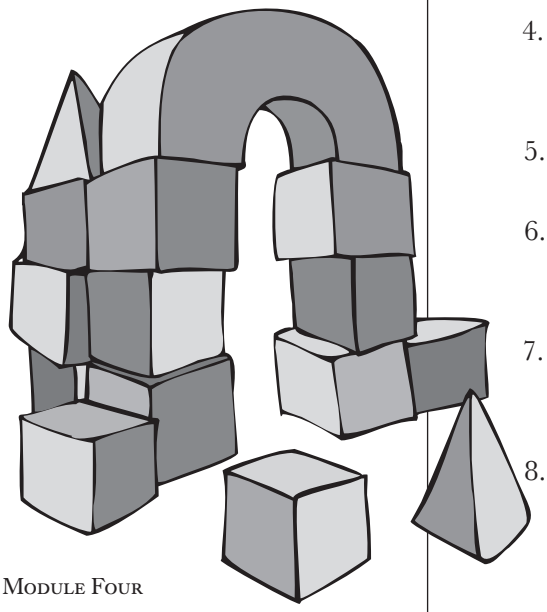
4. Point to the column on the word chart for shape words and tell students that they are going to describe the shapes of the objects.

5. Explain to students that the word *shape* means the outline of an object.

6. Hold up a *square* and ask students to name the shape. Name the shape if they cannot.

7. Write the word *square* on the word chart in the shape words column, and draw a small square next to the word.

8. Hold up a triangle and ask students to name the shape. Name the shape if they are unable to.



9. Write the word *triangle* on the word chart and draw a small triangle next to the word.

10. Continue in this way with a circle and other common shapes.

11. Explain to the class that each group of students will receive a plastic bag filled with various objects and a 12 x 18 inch piece of white construction paper.

12. Tell them that when they receive their materials, they should take the objects out of the bag and place them on the construction paper, which is their workspace.

13. Distribute materials and allow time for students to set up their workspace.

14. Determine that all the objects are made up of matter by asking if the objects take up space and have mass.

15. Ask students to look at the objects on their workspace and describe the shapes they see, holding up the object with that shape.

16. Point to the shape words on the chart as they share and add any shape words that are not listed.

17. Remind students that the objects are made up of matter, and that all matter can be described by its properties.

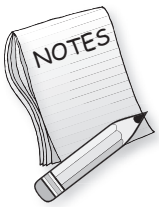
18. Summarize by asking students to name the shape property words they used to describe the objects on their workspaces.

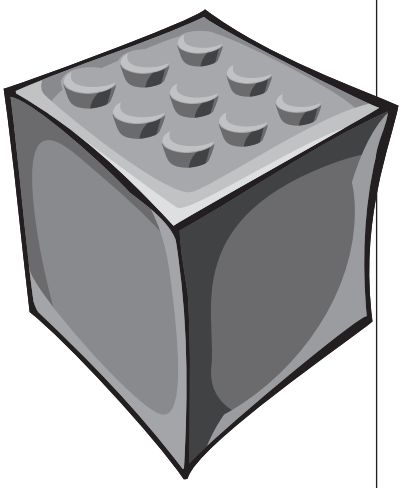
19. Collect materials

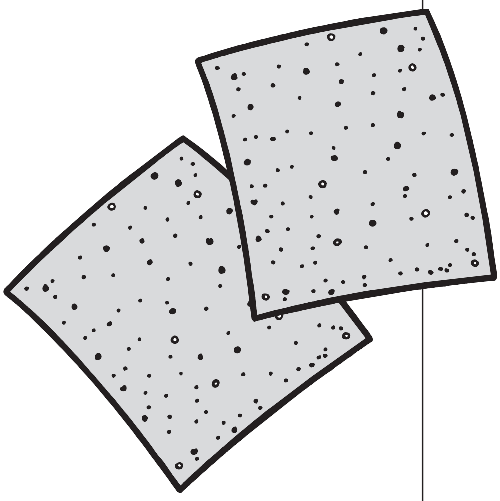
Lesson 4

1. Arrange the class into groups of two students each.

2. Display the **Properties of Matter Word** Chart from Lesson 3.







3. Ask students if they can name any color property words, size property words, and shape property words.

4. Point to the column on the word chart for texture words and tell students that they are going to describe the texture of the objects.

5. Explain to students that the word *texture* means how an object feels when you touch it.

6. Explain to the class that each group of students will receive a plastic bag filled with various objects and a 12 x 18 inch piece of white construction paper.

7. Tell them that when they receive their materials, they should take the objects out of the bag and place them on the construction paper, which is their workspace.

8. Distribute materials and allow time for students to set up their workspace.

9. Determine that all the objects are made up of matter by asking if the objects take up space and have mass.

10. Ask students to touch and feel the block. Be sure that both students in each pair feel the block.

11. Elicit responses from students as to how the block feels.

12. Record their responses under the texture words column on the word chart.

13. Ask students to touch and feel the piece of cotton and to share property words that describe how the cotton feels.

14. Record their responses under the texture words column on the word chart.

15. Continue in this way with each of the objects guiding students to identify a variety of texture property words such as smooth and rough, coarse and

fine, hard and soft, etc.

16. Remind students that the objects are made up of matter and that all matter can be described by its properties.

17. Summarize by asking students to name the texture property words they used to describe the objects on their workspaces.

18. Collect all materials.

Lesson 5

1. Have all students sit in circle in a gathering area.

2. Display the **Properties of Matter Word** Chart.

3. Point to the column that reads weight words and explain that in this lesson they are going to determine the weight of objects.

4. Explain that weight is a measure of how heavy an object is.

5. Ask students to name some words that describe how much an object weighs.

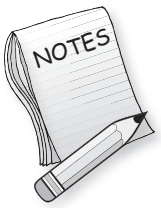
6. Record words such as heavy and light on the word chart.

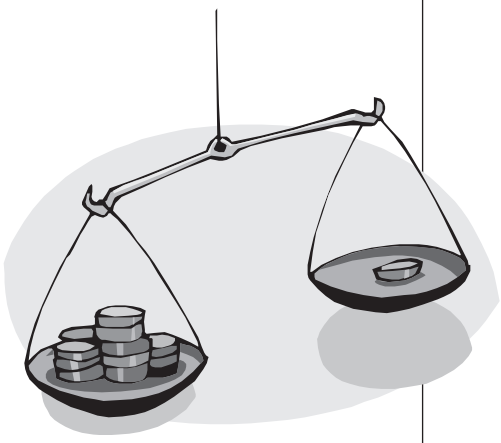
7. Hold up a rock and a crayon.

8. Ask students to do the following:
   o Put your thumbs up if you think the crayon is heavier than the rock.
   o Put your thumbs down if you think it is not.
   o Now, put your thumbs up if you think the rock is heavier than the crayon.

9. Ask students how they can tell if one object is heavier than another.

10. Encourage responses. (Students might say: Put the objects on a scale. Weigh the objects. Hold them in your hands and compare them.)





11. Have a student compare the weights of the rock and the crayon by holding one in each hand.

12. Ask: Which object feels heavier? Which object feels lighter?

13. Repeat with another student or two to verify the finding explaining that scientists often repeat their experiments to see if they get the same results.

14. Explain that now they are going to use a measuring tool to find out which object is heavier and which is lighter.

15. Place a pan-balance in the circle so students can see it.

16. Tell students that this measuring tool is called a pan-balance and can be used to determine which of the two objects is heavier and which is lighter.

17. Have students observe what happens when you the place the crayon in one pan and the rock in the other pan.

18. Ask the following questions:
    a. What happened to the pans?
    b. What do you think that action of the pans tells us about the rock and the crayon?

19. Be sure that students understand that the object that is heavier always makes its pan go down.

20. (AID) Add a pair of scissors to the rock and the crayon and explain that they are going to use the pan-balance to determine which of these three objects is the heaviest and which is the lightest.
    - o Say: You know that the rock is heavier than the crayon.
    - o Place the rock and the scissors in the pans. Observe and discuss the results.
    - o Place the crayon and the scissors in the pans. Observe and discuss the results.
    - o Ask: Which one of the three objects is the heaviest? Which one of the three objects is the lightest?

o Discuss how the weight of the leftover object can be described.

21. Explain to students that they will have an opportunity to weigh objects using the pan balance to see which object is the heaviest and which object is the lightest.

22. Hold up **BLM4ii: Weight** and explain that they will record their observations on paper by drawing a picture of the heaviest and lightest objects in the appropriate pans.

23. Arrange students in groups of four and have them go to areas in the room where they have room to weigh objects using the pan balance.

24. When students are in their work areas, ask one student from each group to come and get a pan-balance for the group.

25. Then ask another student from each group to come and get a plastic bag containing the two objects to be weighed.

26. Have students weigh the objects using the pan balance and record the results on their recording sheets (**BLM4ii: Weight**).

27. After they complete their task, have each group place their objects back into the plastic bags and exchange bags with a group near them.

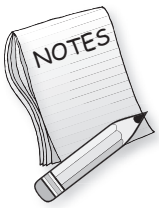
28. Have students weigh the new set of objects and record their findings.

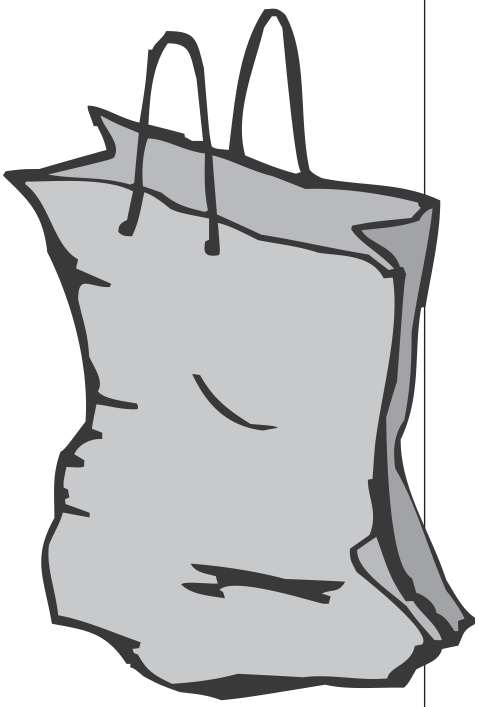
29. Continue in this way until students have a chance to weigh all objects.

30. Discuss the results with students, checking with each group to see if they had the same results. If results differ, you can weigh the objects in dispute so the class can see the results.

31. Remind students that the objects they weighed are made up of matter and that all matter can be described by its properties.

32. Summarize by asking students to name the weight property words they used to describe the objects they weighed.





33. Collect all materials.

Products and Assignments

- **Properties of Matter Word Chart** completed by the teacher. Keep for display.
- **BLM4ii: Weight** recording sheets completed by students.

Extension Activities (20 minutes)

- Pass out to each pair of students an opaque bag with two to three objects in it.
- Tell students not to look in the bag.
- Explain that there are objects made up of matter in the bag.
- Tell them that one partner in the pair will reach in and grab one object of matter, keeping it in the bag and not looking at it.
- Without looking at it, students will describe the object using property words.
- The second partner in the pair should try to guess what the object is by the description.
- After the guess is made, the student with his/her hand in the bag can take the object out and together the pair can look at it and discuss its properties.
- Next have students reverse roles and do the activity again.
- After both students in the pair have their turns, ask the class what properties they were able to describe and how they did that.
- Ask why they couldn't describe color.
- Collect all materials.
- (AID): Have students play "I'm thinking of matter that is . . ." in which they describe objects not in view such as a cat, dog, etc.

Post Assessment (10 minutes)

- With students in a whole group arrangement hold up any object and ask the following question:
  o What are the properties of this object?
- Use more than one object if necessary to elicit responses from all students.

Debriefing and Reflection Opportunities (15 minutes)

- Following the teaching and learning activities, ask students to sit with a partner and play "I see some matter that is . . ." in which students describe an object they see in the classroom using property words.
- The partner then uses that description to name the object.
- Partners then switch roles.
- The teacher circulates to listen to the property words that are being used by students.

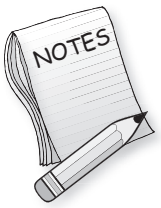
Pre and Post Assessment Rubric

3 The student was able to use appropriate property words to describe the properties of the object displayed.

2 The student was able to use words to describe the properties of the object displayed but was not always accurate in the appropriate use of property words.

1 The student had difficulty describing the properties of the object displayed using appropriate property words.

0 The student was unable to use property words to describe the properties of the object displayed.



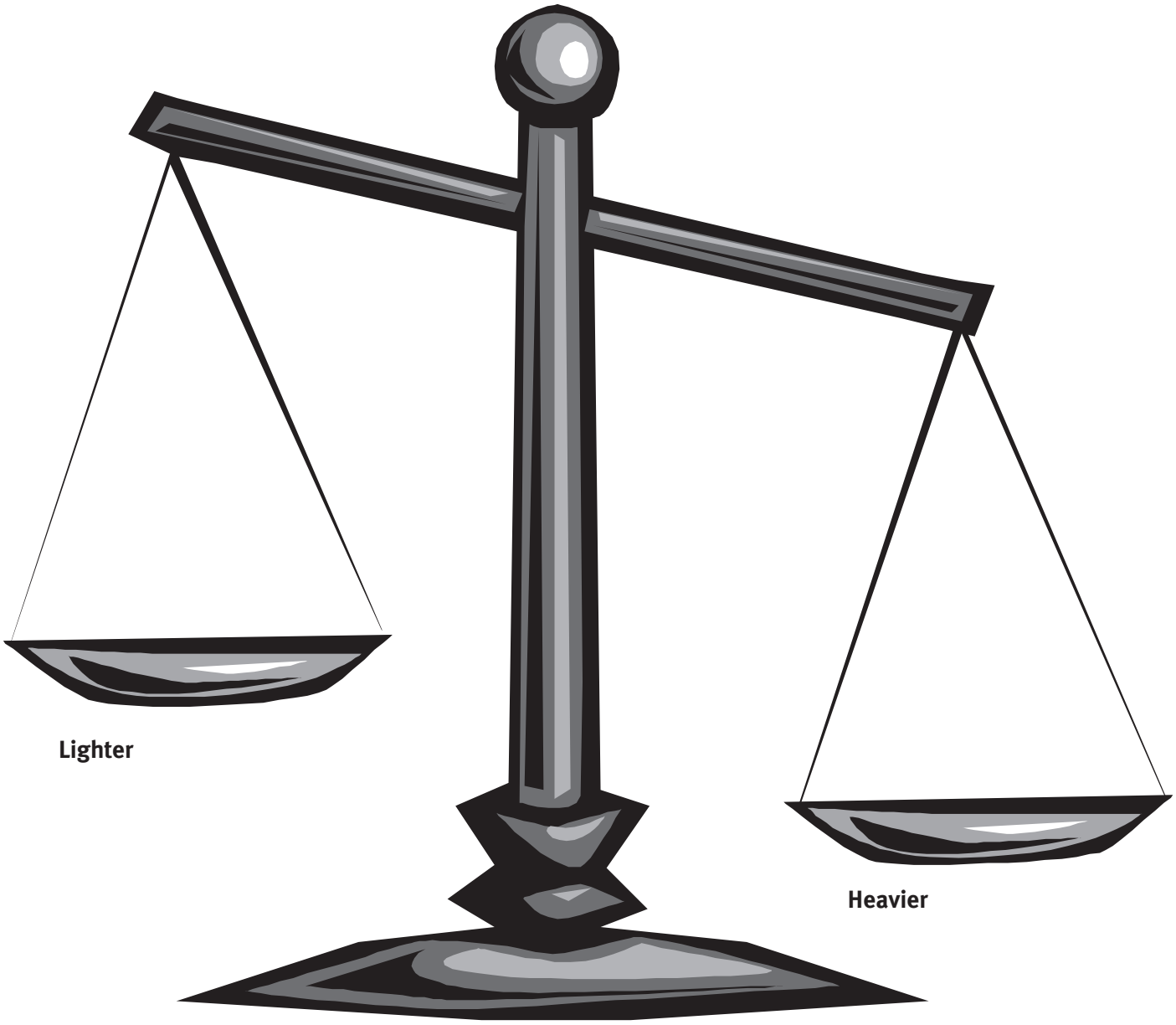
BLM4i: Properties of Matter Word Chart

On large chart paper, reproduce the following.

Properties of Matter Word Chart

Color Words	Shape Words	Size Words	Texture Words	Weight Words

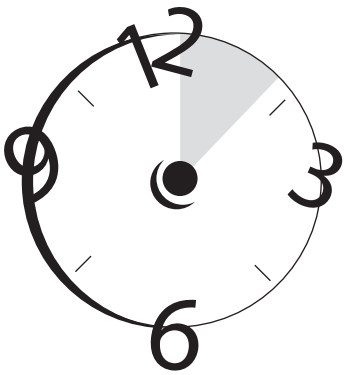
BLM4ii: Weight



Sorting Matter

Core/Connections/AID

Time Allocation: 1 Hour, 30 Minutes
Required Materials and Resources on Page 110



Lesson Overview

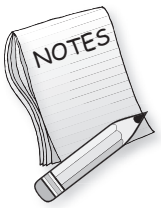
In this module, students will be introduced to the concept that matter can be categorized (sorted) by its properties. They will further learn that categorizing (sorting) matter can bring order to situations, and that order can make understanding easier. Students will work with a partner to determine the properties they will use to categorize (sort) objects. They will also engage in an activity where sorting will assist them in solving a problem. This module addresses the following principle: Matter can be categorized by its properties; as well as its corresponding minor principle: Categorizing creates an order that makes understanding easier.

Guiding Questions

- What does it mean to categorize (sort) matter?
- How can matter be categorized (sorted)?
- How does categorizing (sorting) matter make understanding easier?

BIG IDEA

Categorizing Creates Order



Content Goals

Universal Themes

Systems, Order and Organization

Principles and Generalizations

- Matter can be categorized by its properties.
- Categorizing creates an order that makes understanding easier.

Concepts

- Categorize/sort
- Compare
- Contrast
- Same
- Different

Teacher Information

- Matter is anything that takes up space and has mass.
- Matter can be categorized or sorted by it properties.
- Categorizing (sorting) creates an order that makes understanding easier.
- Categorizing (sorting) involves placing a set of things, people or actions together in a particular group because they share common characteristics.
- A property is a quality or trait that is characteristic of a person or object. A property is any quality that serves to describe or define an object, material or relationship.
- A property can also be an effect that a material or substance has on another object or on one or more of the senses.
- Some of the properties of matter include color, shape, size, texture, weight, and material.
- Compare means to examine two or more people or things in order to discover similarities and differences between them.
- Contrast refers to a difference, or something that is different, compared with something else.
- Observe refers to the use of senses to learn about objects and events in the environment.
- Infer means to conclude from evidence or derive a conclusion from facts.

Sorting Matter

Skills

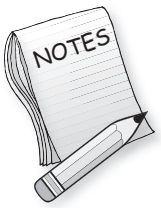
- Categorize/sort
- Observe
- Compare
- Contrast
- Infer

Materials and Resources

1. White construction paper 12 x 18 inch
2. Red construction paper to cut out square shapes
3. Blue construction paper to cut out square shapes
4. One pair of scissors to cut out the square shapes
5. Plastic bags – one for each pair of students
6. Objects of various colors, sizes, shapes, textures and weights (i.e. blocks, balloons, buttons, marbles, shells, plastic spoons, corks, feathers, rough and smooth rocks, rubber bands, coarse sandpaper, cotton, etc. – about 15 assorted items per pair of students)
7. Color tiles (or, if tiles are not available, many cut out paper squares that are the same size from red, yellow, blue and green construction paper)
8. Yellow and green construction paper if tiles are not available
9. **Properties of Matter Word Chart** from previous lessons.
10. (AID) Extension Activity: Pattern Blocks

Preparation Activities

1. Have ready one 12 x 18-inch piece of white construction paper for each pair of students.
2. Cut out several large and small square shapes from red construction paper.
3. Cut out several large and small square shapes from blue construction paper.
4. Prepare one plastic bag for each pair of students with about 15 assorted objects of various colors, sizes, shapes, textures and weights (i.e. blocks, balloons, buttons, marbles, shells, plastic spoons, corks, feathers, rough and smooth rocks, rubber bands, coarse sandpaper, cotton, etc.)
5. Display the **Properties of Matter Word Chart**.
6. Place about 20 –25 assorted color tiles in a plastic bag for each pair of students (or, if tiles are not available, many cut out paper squares that are the same size from red, yellow, blue and green construction paper).



7. (AID): Put a small amount of assorted pattern blocks into a plastic bag for each pair of students.

Introductory Activities (15 minutes)

- Have the whole class sit in a circle in a gathering area.
- Place a 12 x 18 inch white piece of construction paper in the circle for all to see.
- The paper can serve as the workspace.
- Place several large and small blue and red paper squares on the workspace.
- Ask students to describe the properties of the squares.
- Separate the squares into groups: one red, one blue.
- Ask students if they can explain what you did.
- Affirm that you placed the paper squares into two groups and that the property used was color.
- Explain that this process is called sorting.
- Write the word *sorting* where it can be seen by the class.
- Mix the squares and ask if we can use another property to sort the squares.
- Elicit responses.
- Lead students if necessary to see that the squares can be sorted by size: large and small.
- Summarize by saying that grouping objects that are alike in some way is called sorting.

Pre-assessment

N/A

Teaching and Learning Activities (1 hour)

Lesson 1

1. Arrange the class in groups of two students each.

2. Explain that each pair of students will receive a plastic bag of objects of various colors, sizes, shapes, textures and weights, and a 12 x 18 inch piece of white construction paper.

3. Tell students that they should take the objects out and place them on the construction paper, which is their workspace.

4. Distribute the materials and have students set up their workspace.

5. Determine that the objects are matter because they take up space and have mass.

6. Display the **Properties of Matter Word Chart**.

7. Ask students if they can choose a property from the chart that we can use to sort the objects.

8. Call on a volunteer for a choice.

9. Ask the class to sort their objects according to the choice made by the volunteer.

10. Circulate to see that students understand the task.

11. Allow time for students to complete the task.

12. Discuss with students what objects they placed in groups and why.

13. Have students look at the **Properties of Matter Word Chart** again and explain the following directions:
    o Discuss with your partner another way to sort the objects.
    o Agree on a sorting rule.
    o Sort the objects according to your sorting rule.

14. Allow time for students to sort their objects.

15. Circulate to see that students understand the task.

16. When students have completed the task, ask a volunteer pair what rule was used to sort the objects on their workspace.

17. Ask if any other group used the same rule to sort their objects.

18. Ask if anyone sorted the objects using a different rule.

19. Elicit responses.

20. When students have shared their rules for sorting, ask them to sort the objects again using a rule that is different from the one they just used.

21. Discuss their sorting rules.

22. Then have students continue to sort their objects in as many different ways as they can.

23. Circulate and discuss with each group the rules they used to sort the objects.

24. Have students share their sorting rules until all the ways for sorting are discussed.

25. Collect materials.

Lesson 2

1. Gather the whole class in a sitting circle.

2. Display the **Properties of Matter Word Chart** for all to see.

3. Ask students to look at the chart and think about how sorting objects by these properties can be helpful.

4. Discuss responses.

5. Hold up a large plastic bag filled with color tiles for all to see.

6. Determine that the tiles are matter because they take up space and have mass.

7. Ask the following question:
   o Although we can see some of the colors of tiles in this bag, is it easy to tell how many tiles of each color are in this bag?

8. Explain that they are going to work in groups of two to do the following:
   o Find an easy way to count the number of tiles for each color.

9. Group students into pairs and send them to their work areas.

10. Pass out a plastic bag of color tiles and a 12 x 18-inch piece of white construction paper to each pair of students.

11. Have them place the tiles on the white paper, which serves as their workspace.

12. Allow time for students to complete the task.

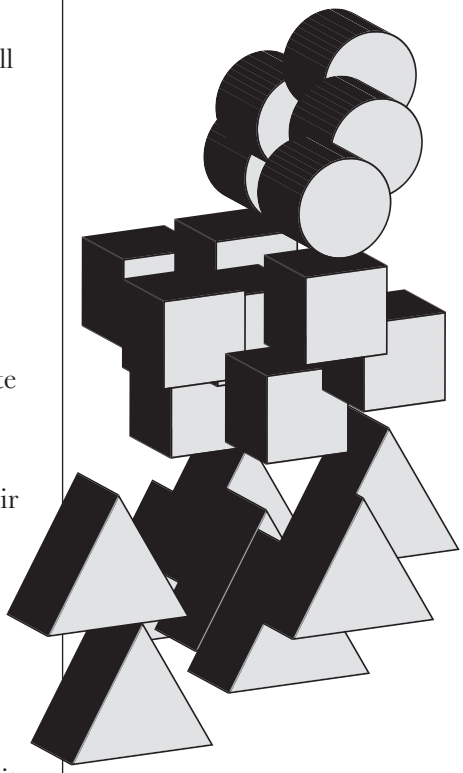
13. Circulate to see the responses to the task. Assist if needed.

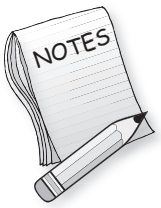
14. When students have completed the task, ask them what they did to make it easier to count the number of tiles for each color.

15. Elicit responses.

16. Ask why it was easier to tell which color had the most tiles once the tiles were sorted.

17. Discuss responses.





18. Lead them to understand that by sorting the colors it was easier to count the number of tiles for each color and to see which color had the most tiles.

19. Collect all materials.

Products and Assignments

N/A

Extension Activities (30 minutes)

1. (AID) Pass out a plastic bag of pattern blocks to each pair of students.
2. Ask them to sort the blocks so that they are the same in two ways. (i.e. shape and color; color and size)
3. Have them share their rules for sorting with one another.

Post Assessment

N/A

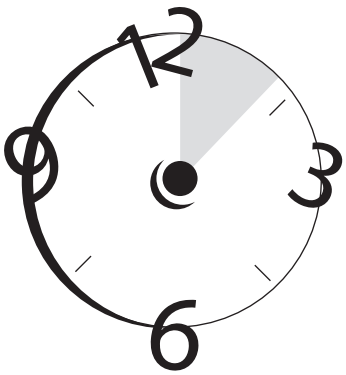
Debriefing and Reflection Opportunities (15 minutes)

1. Following the teaching and learning activities, ask students to think, pair, share about the following:
   - What ways do you use sorting at home in your bedroom?
   - What ways do you use sorting at school in or on your desks?
2. Have students share some of their ideas with the class as a whole.
3. Ask students if they see any other ways we use sorting in the classroom, in the grocery story, in the library.
4. Discuss responses.
5. Ask why they think sorting is important? Discuss responses.

The States of Matter

Core/Connections

Time Allocation: 2 Hours, 30 Minutes
Required Materials and Resources on Page 110



Lesson Overview

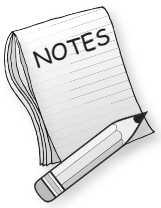
In this module, students will learn about the three states of matter common to earth. They will become active participants in a series of experiments that will allow them to observe the characteristics of solids, liquids and gases. This module addresses the following principle: Matter occurs in three commonly recognized states: solid, liquid and gas; as well as its corresponding minor principles: Each state of matter has unique characteristics and matter can be measured.

Guiding Questions

- What are the characteristics of solid matter?
- What are the characteristics of liquid matter?
- What are the characteristics of gas matter?

BIG IDEA

Matter: Solids, Liquids, Gases



Content Goals

Universal Themes

- Systems, Order and Organization

Principles and Generalizations

- Matter occurs in three commonly recognized states: solid, liquid and gas.
- Each state of matter has unique characteristics.
- Matter can be measured.

Concepts

- States of Matter
- Solid
- Liquid
- Gas
- Measurement
- Shape
- Size (Volume)

Teacher Information

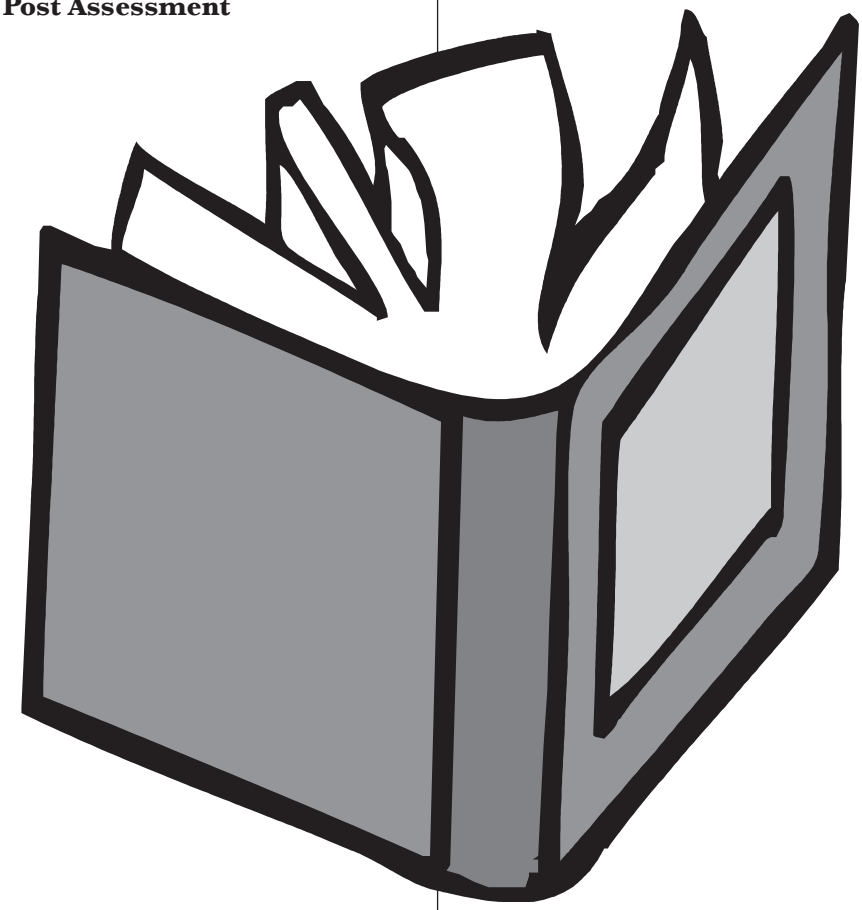
- The states of matter refer to the three types or groups of matter most commonly recognized on earth: solids, liquids and gases.
- Solid matter maintains its own shape and volume (size) instead of conforming to the shape and volume of its container.
- Liquid matter has a definite volume, but it has lost its definite shape. When liquid matter is poured from one container into another, the shape of the liquid changes to fit the shape of the container, but the amount of liquid remains the same.
- Gas matter has no definite shape and no definite volume. It expands to fit the shape and fill the volume of its container.
- Shape refers to the quality of a distinct object or body which has an external surface or outline of specific form or figure.
- Volume is the amount of space that an object or substance occupies.

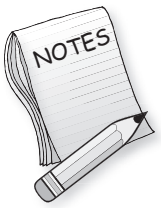
Skills

- Observe
- Predict
- Measure data
- Gather data
- Record data
- Communicate data
- Categorize
- Infer

Materials and Resources

1. **BLM6i: States of Matter**
2. Matter sheet with images of solids, liquids and gases
3. **BLM6iii: States of Matter Pre- and Post Assessment**
4. **BLM6iv: Measuring Matter**
5. Chart paper
6. Marker
7. White construction paper 12 x 18-inch
8. Crayons
9. Cloth 5x5-centimeter pieces
10. Centimeter rulers
11. Paper clips
12. One-liter clear plastic containers
13. Pencils
14. Stapler
15. Cotton balls
16. Magnifiers
17. Plastic bags
18. 9-ounce or larger plastic cups
19. One-liter clear plastic containers
20. One-cup measure
21. Paper towels
22. Balloons of various sizes and shapes
23. String
24. Scissors
25. Lunch size paper bags



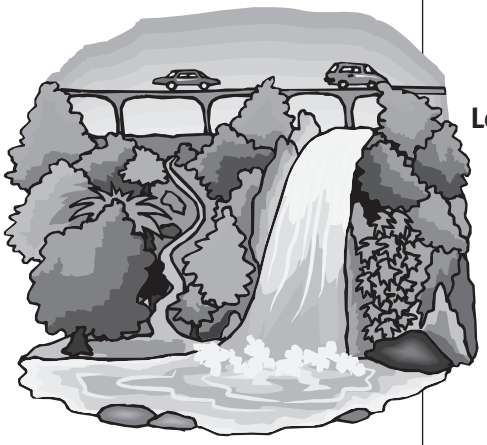


26. One cup with a spoonful of sugar
27. One cup with a spoonful of granular instant coffee.
28. Blue construction paper 9 x 12-inch
29. Toothpicks

Preparation Activities

Lessons 1, 2, 3

1. Prepare a sheet with the following images of matter: a block, cotton, a container of milk, a glass of water, a bottle of maple syrup, an apple, a steaming pot, a waterfall, and some air-filled balloons. If you do not have such pictures available, go to www.google.com and click on images; then put in the name of the image you need.
2. Prepare a class size **State of Matter** chart. Use the directions on **BLM6i** for instructions.
3. **Copy BLM6iii: States of Matter Pre- and Post Assessment** so each student has one copy for a pre-assessment and one copy for a post assessment.



Lesson 1

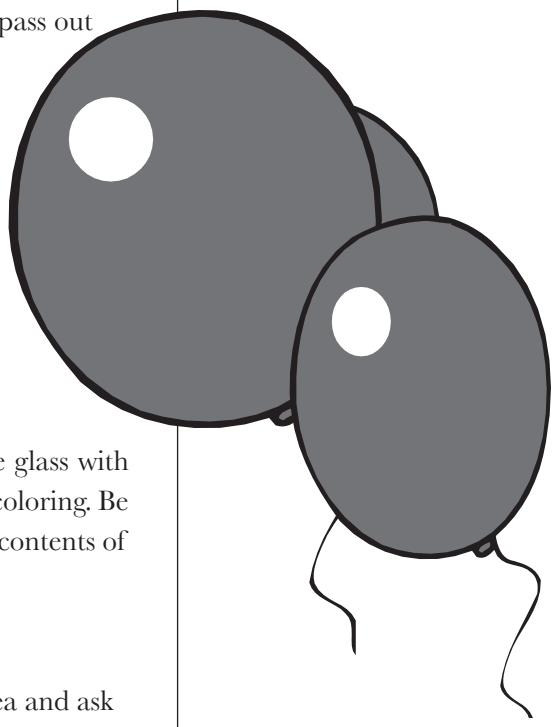
1. Gather 12 x 18-inch white construction paper, one piece for each group of two students.
2. Prepare a plastic bag with the following materials for each group of two students: one crayon, one 5x5-centimeter piece of cloth, one centimeter ruler or several small paper clips depending on whether students are using standard or non-standard units of measurement.
3. Obtain one 1-litter clear plastic container for each group of two students.
4. Have on hand one stapler or other object considered a solid.
5. Copy **BLM6iv: Measuring Matter** so each student has one copy. (Use the portion that corresponds to the measuring tool that will be used.)
6. Ensure that each student has a pencil for recording purposes.
7. Have available one lunch-size paper bags for each group of two students.
8. Have ready cotton balls and magnifiers for AID activity.

Lesson 2

1. Prepare the following materials for each group of two students:
   - One 12 x 18-inch piece of white construction paper to serve as a workspace
   - One 1-cup measure
   - One 1-litter clear plastic container
   - Two containers of different sizes that will hold a minimum of one measuring cup of water (9-ounce cups or larger)
2. Obtain enough water to fill the one-cup measure.
3. Have paper towels available for water spills.

Lesson 3

1. Have ready one balloon for each group of two students being sure to pass out balloons of various sizes and shapes.
2. Pre-cut an 8-inch piece of string for each group of two students.



Extension Activity

1. Prepare the following for each group of two students:
   - One cup with a spoonful of sugar
   - One cup with a spoonful of granular instant coffee.
   - One piece of 9 x 12-inch blue construction paper
   - Two toothpicks
   - Two magnifiers
2. Prepare two clear plastic glasses that are the same size. Fill one glass with plain water, and fill the other glass with water colored with food coloring. Be sure to have on hand a clear plastic container that can hold the contents of both glasses of water.

Introductory Activities (15 minutes)

- Gather students in a whole group arrangement in a meeting area and ask students to share what they know about matter.
- Display the **States of Matter** chart
- Name each picture on the chart.
- Then ask the following questions:
  - o Do these pictures show matter? Why?
  - o Why do you think the pictures of matter have been placed into these three groups? Give me your best guess.

- Accept all answers without comment.
- Explain to students that scientists sometimes make predictions, which are their best guesses, when they are asked a question. Then they investigate or study to try to find answers to their questions.
- Explain that they are going to be like scientists and study more about matter to be sure they understand why matter is placed into each of these three groups.

Pre-assessment (15 minutes)

1. Pass out one copy of **BLM6iii: States of Matter Pre-Assessment and Post Assessment** to each student.
2. Have students write their names on the papers.
3. Ask students to do the following:
   o Find Box 1 on your paper.
   o Draw a picture of a solid in Box 1.
   o Find Box 2.
   o Draw a picture of a liquid in Box 2.
   o Find Box 3.
   o Draw a picture of a gas in Box 3.
4. Collect the papers and review.

Teaching and Learning Activities (1 hour and 30 minutes)
Lesson 1

1. Arrange the class into groups of two students each.

2. Tell students that not all matter is alike.

3. Explain to students that they are going to investigate why matter is separated into three groups or states of matter.

4. Distribute the following materials to each group of students.
   o One 12 x 18-inch piece of white construction paper to serve as a workspace
   o One 1-litter clear plastic container
   o A plastic bag with the following materials in it:
      • 1 crayon

- One 2 x 2-inch piece of cloth
- 1 centimeter ruler or several small paper clips depending on whether students are using standard or non-standard units of measurement
- 2 recording sheets (**BLM6iv: Measuring Matter**)

o Be sure that each student has a pencil for recording data.

5. Have students organize their materials on their workspace.

6. Name each item and discuss the use of the measuring tool.

7. Ask students to describe the shape of the crayon.

8. Then direct them to do the following to find the size of the crayon:
   o Use your measuring tool to measure how many centimeters (paper clips) long the crayon is. (The teacher may need to demonstrate how to do this.)
   o Record that number on line A of your recording sheet.

9. Next, ask students to talk to their partners and make their best guess or prediction as to whether the shape and size of the crayon will change when they move it from their workspace to the plastic container.

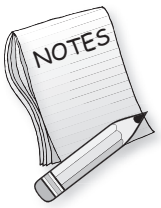
10. Listen to their predictions and explanations as to why they made their predictions.

11. Then have them place the crayon in the container and observe it.

12. Ask students if the crayon changed its shape when it was placed in the container.

13. Have them measure the length of the crayon in the container and record the results on line B.

14. Then have them compare the results with their first measurements and ask if the size of the crayon changed when they put it in the container.



15. Discuss whether their predictions were proven true.

16. Summarize by asking students why they think the crayon didn't change its shape and size when it was moved to the container.

17. Have them put the crayon aside and take out the 5x5-centimeter piece of cloth.

18. Follow the same procedure with the piece of cloth that was followed for the crayon.

19. After the investigation is completed, discuss the results by asking the following questions:
    - o What happened to the shapes of the crayon and the cloth when they were moved from one place to another?
    - o What happened to the sizes of the crayon and the cloth when they were moved from one place to another?

20. Explain to students that the crayon and the cloth are in the group or state of matter that is called ***solid*** matter. The shape and size of solid matter stay the same no matter what container you place it in.

21. Tell students that some solids are hard and some are soft, but all solids keep their size and shape unless you do something to change them. For example:
    - o A rock can be smashed by a hammer.
    - o A piece of wood can be cut by a saw.
    - o A piece of solid chocolate can be melted when heated

22. Explain to students that you want them to be science detectives and find evidence of solid matter in the classroom.
    - o Pass out a lunch-size bag to each group of two students.
    - o Have groups circulate around the room, selecting objects of solid matter and placing them in their bag.
    - o After a few minutes ask students to bring their evidence of solids to a meeting area and sit with their partner in a circle.
    - o Have students display their evidence.

o As they hold up each object, ask the rest of the class to show the thumbs up sign if the object is a solid and the thumbs down sign if the object is not a solid.
o Discuss objects that are questionable as needed.

23. Instruct students to explain why the objects are evidence of solid matter. (It has a definite shape and size that will not change if it is moved to another place.)

24. Display the **States of Matter** chart and have students name the objects in the first column.

25. Ask them if any of those pictures represent solid matter and why.

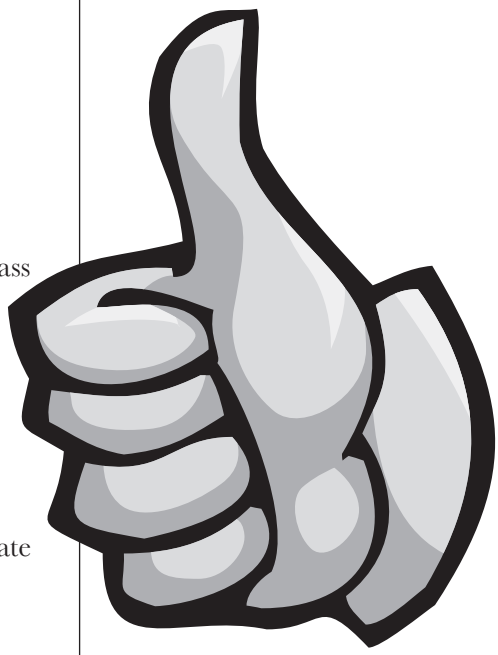
26. Affirm that they are all pictures of solid matter.

27. Write the word ***Solids*** at the top of that column. Read the word to the class and explain why you wrote it in that column.

28. Summarize by writing the characteristics of a solid in that column:
    o Keeps its shape
    o Keeps its size

29. Explain that in another lesson, they will learn about another group or state of matter.

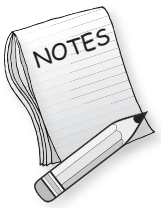
30. (AID) Challenge students by asking them if cotton is a solid.
    o Pass out to each pair of students a ball of cotton and a magnifier.
    o Have them look at the cotton and describe what they see.
    o Ask why cotton is considered a solid.



Lesson 2

1. Arrange the class in groups of two students each.

2. Display the **States of Matter** chart.

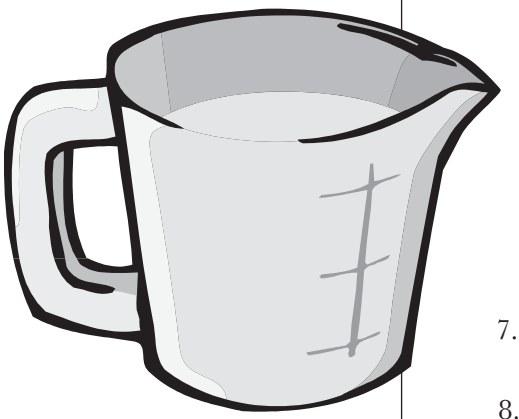


3. Remind students that matter is separated into three groups or states.

4. Review the pictures of solids and ask students why those pictures are considered solids. (They keep their shape and size even if they are moved from one container to another.)

5. Explain that we are going to learn about another group or state of matter in this lesson.

6. Distribute the following materials to each group of students:
   - o One 12 x 18-inch piece of white construction paper to serve as a workspace
   - o One 1-cup measure
   - o One 1-litter plastic container
   - o Two plastic cups or various shaped containers that will hold a minimum of one cup of water
   - o Paper towels



7. Have students organize their materials on their workspace.

8. Fill the one-cup measure with water to the one-cup mark.

9. Ask students to describe what is in the one-cup measure.

10. Ask students if the water can be measured.

11. Explain to students that the water can be measured and the amount of water is shown by the mark on the cup. Discuss.

12. Ask students if the water has a shape. (It takes the shape of the container it is in.)

13. Explain that we are going to do an experiment to see if the shape of the water and the amount of water changes or stays the same when it's poured from one container to another.

14. Next ask students to talk to their partners and make their best guess or prediction as to whether the shape of water and amount of water will change when they pour it from one cup to another cup.

15. Listen to their predictions and explanations as to why they made their predictions.

16. Explain to the class that they should watch closely how to carefully pour water from one container to another.

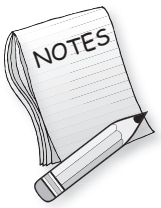
17. Demonstrate how to pour the water from the one-cup measure to another container.

18. Then have students pour the water from the one-cup measure to another container and ask the following questions:
    - o What happened to the shape of the water when you poured it into the other container? (It changed.)
    - o What happened to the amount of water when you poured it into the other container? (It stayed the same.)
        - • If students think the amount of water changed, have them pour the water back into the one-cup measure and check to see that it reaches the mark on the cup.
        - • Then ask: Do you still have the same amount of water? How can you tell? What does that tell you about the amount of water?

19. Have students try the experiment again by pouring the water from the one-cup measure to a different container.

20. Ask these questions again:
    - o What happened to the shape of the water when you poured it to a different container?
    - o What happened to the amount of water when you poured it to a different container?

21. Discuss with students why the shape of the water changed when it was poured from one container to another container.



22. Then discuss why the amount of water did not change when it was poured from one container to another container.

23. Explain to students that water is a part of the group or state of matter that is called liquid matter. A liquid does not have its own shape. It takes the shape of the container that it is poured into. However, the amount of the liquid stays the same when it is poured from one container to another.

24. Ask students to be science detectives and name other examples of liquid matter.

25. Have students share their responses and explain why each is an example of liquid matter.
    - o It does not have its own shape.
    - o The amount of liquid stays the same when it is poured from one container to another.

26. Display the **States of Matter** chart and have students name the objects in the second column.

27. Ask them if any of those pictures represent liquid matter and why.

28. Affirm that they are all pictures of liquid matter.

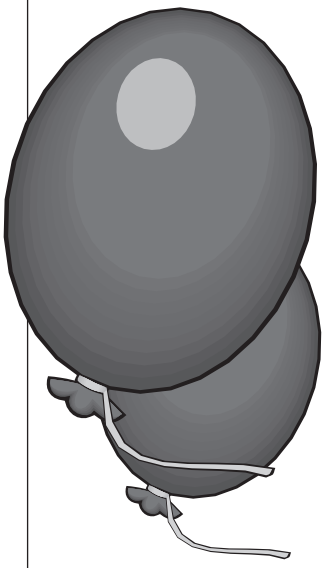
29. Write the word ***Liquids*** at the top of that column. Read the word to the class and explain why you wrote it in that column.

30. Summarize by writing the characteristics of a liquid in that column:
    - o Does not keep its shape
    - o Keeps its size

31. Explain that in another lesson, they will learn about another group or state of matter.

Lesson 3

1. Seat students in a whole group seating arrangement in a meeting area.



2. Ask students if they can see air.

3. Then ask if they think that air has a shape.
4. Next ask if they think air has a size.

5. Explain that since air cannot be seen, we will have to study it by seeing what it does when we put it in a container.

6. Demonstrate how to blow up a balloon *halfway* and then twist the neck of the balloon to keep the air from escaping.

7. Next ask a student volunteer to tie a piece of string around the neck of the balloon.

8. Ask students what was blown into the balloon?

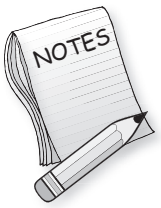
9. Explain to the class that they will work in pairs and that each pair of students will receive a balloon that they will fill *halfway* with air and a piece of string to tie the neck of the balloon so the air won't escape. Be sure they understand that the balloon will become the container that holds the air.

10. State the rules that the groups must follow:
    - o Each group must decide who will fill the balloon ***halfway*** with air and who will tie the neck of the balloon with string.
    - o Only one student can put his or her mouth to the balloon so that germs are not shared.
    - o The teacher will assist with decisions if that is necessary.

11. After each group of students has completed the task of filling their balloons halfway with air, ask students to predict what will happen to the shape of the balloon if they press on it?

12. Discuss their predictions and reasoning.

13. Have students gently press on the balloon and observe the results.



14. Elicit responses as to what happened to the shape of the balloon. (It changed.)

15. Affirm that by pressing on the balloon, they changed the shape of the balloon.
16. Next ask students what is the shape of the air in the balloon.

17. Then ask students to predict what will happen to the shape of the air in the balloon if they press on the balloon?

18. Discuss their predictions and reasoning.

19. Have students gently press on the balloon and observe what happened to the shape of the air in the balloon.

20. Elicit responses as to what happened to the shape of the air in the balloon. (It changed.)

21. Ask students if air has a definite shape like a crayon has a definite shape. (No)

22. Affirm that by pressing on the balloon, they changed the shape of the container the air was in and when they did that, the shape of the air changed. Therefore, the air does not have a definite shape, but instead has the shape of the container that it is in.

23. Ask students if they think we can measure air.

24. Explain that we cannot measure air unless we put it into a container. So, air does not have a definite size.

25. Explain to the class that air belongs to the group or state of matter called Gases. (Be sure that students understand the difference between gases as a state of matter and the gasoline you put into a car, which is a liquid.)

26. Display the **States of Matter** chart and review the solid and liquid matter columns.

27. Look at the third column and explain that air is a gas and like most gases, you cannot see it.

28. Name the pictures under the third column and explain what steam is. Tell students that steam is also a gas and that is one gas you can see when water boils.

29. Label the third column ***Gases*** on the **States of Matter** chart.

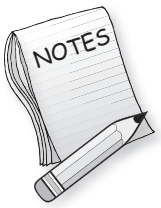
30. Summarize by writing the characteristics of a gas in that column:
    o Does not keep its shape
    o Does not keep its size

Products and Assignments

- **BLM6iii: States of Matter Pre- and Post-Assessment** from each student
- **BLM6iv: Measuring Matter** from each student
- **States of Matter** chart (teacher made)

Extension Activities (30 minutes)

1. Gather entire class and sit in a circle in a meeting area.
2. Display a clear plastic glass of water and a clear plastic glass of water colored with food coloring.
3. Ask students if the glasses contain solid, liquid or gas matter.
4. Have students predict what will happen when the two glasses of liquid matter are mixed together.
5. Elicit responses.
6. Pour both glasses of liquid into a third clear plastic container and mix.
7. Have students observe the results.
8. Discuss their observations by asking what happened when the two glasses of liquid matter were mixed together.
9. Ask students if they think the liquids could be separated back into their original form.
10. Affirm that once these liquids were mixed, they could not be separated.
11. Then ask students to predict what would happen if two solids were mixed together.



12. Elicit responses.
13. Explain to students that they will work on an experiment in pairs to check their predictions.
14. Arrange the class in groups of two students each.
15. Distribute the following materials to each group of students:
    - 1 cup with a spoonful of sugar
    - 1 cup with a spoonful of granular instant coffee.
    - 1 piece of 9 x 12-inch blue construction paper
    - 2 toothpicks
    - 2 magnifiers
16. Have students place a small amount of the sugar on the blue paper, observe it with the magnifier, and describe what they see.
17. Verify that the sugar is a solid even though you can pour it. It is made up of many tiny solid pieces called crystals.
18. Repeat this exercise with the granular instant coffee.
19. Next have students mix the sugar and coffee together in one cup.
20. Then have students pour some of the combined mixture on the blue paper and examine it with the magnifier.
21. Have students describe what they see. (They should see separate sugar and coffee grains.)
22. Challenge them to use the toothpicks to try to separate the grains.
23. (AID) Ask why they think the solids that were mixed together could be separated but not the liquids.
24. Elicit responses and discuss.

Post Assessment (15 minutes)

1. Pass out one copy of **BLM6iii: States of Matter Pre-assessment** and **Post Assessment** to each student.
2. Have students write their names on the papers.
3. Ask students to do the following:
    - Find Box 1 on your paper.
    - Draw a picture of a solid in Box 1.
    - Find Box 2.
    - Draw a picture of a liquid in Box 2.
    - Find Box 3.
    - Draw a picture of a gas in Box 3.
4. Collect the papers and review.

Debriefing and Reflection Opportunities (15 minutes)

- Following the teaching and learning activities, gather the class as a whole group.
- Display the **States of Matter** chart and ask students to think, pair, share several examples of matter that would go under each label.
- After a few minutes, gather the class again and have them share their examples.
- Record their responses under the appropriate column and ask them to explain their choices based upon shape and size.

Pre and Post Assessment Rubric

3 The student was able to draw a picture of a solid, of a liquid and of a gas in the appropriate boxes.

2 The student was able to draw a picture of two of the required pictures in the appropriate boxes.

1 The student was able to draw a picture of one of the required pictures in the appropriate box.

0 The student was not able to draw a picture of a solid, of a liquid or of a gas in the appropriate boxes.

BLM6ii: States of Matter

Set up a large class size chart in the following way for viewing by the class. Paste the pictures from **BLM 6ii: Pictures of Solids, Liquids and Gases**. Do not label each column until indicated in the Teaching/ Learning activities.

Paste the pictures of a block, cotton and apple in this column of the classroom chart.	Paste the pictures of a glass of water, milk and the river in this column of the classroom chart.	Paste the pictures of steam and the air-filled balloon in this column of the classroom chart.

States of Matter
BLM6iii: States of Matter Pre-assessment and Post Assessment

Name: _____

1. Solid	**2. Liquid**
3. Gas	

BLM6iv: Measuring Matter (Centimeters)

Name: _____

A. The

is _____centimeters long.

B. The

is _____centimeters long.

C. The
is _____ centimeters long.

D. The
is _____ centimeters long.

BLM 6iv: Measuring Matter (Paper Clips)

Name: _____

A. The

is _____paper clips long.

B. The

is _____paper clips long.

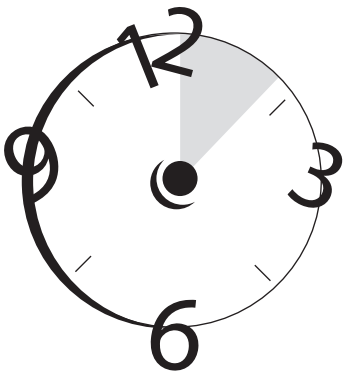
C. The
is _____paper clips long.

D. The
is _____paper clips long.

Changing States of Matter

Core/Connections

Time Allocation: 2 Hours, 35 Minutes
Required Materials and Resources on Page 110



Lesson Overview

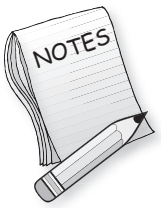
In this module, students will learn about the changing states of matter. Students will engage in experiments where they will observe solid matter changing state into liquid matter and liquid matter changing state into gas matter. As they analyze the results of their experiments, students will determine what it was that caused matter to change from one state to another. This module addresses the following principle: Changes in states of matter generally result from changes in temperature.

Guiding Questions

- Can matter change from one state to another?
- What causes matter to change state?

BIG IDEA

What Causes Matter to Change States?



Content Goals

Universal Themes

- Constancy, Change and Measurement
- Energy

Principles and Generalizations

Changes in states of matter generally result from changes in temperature.

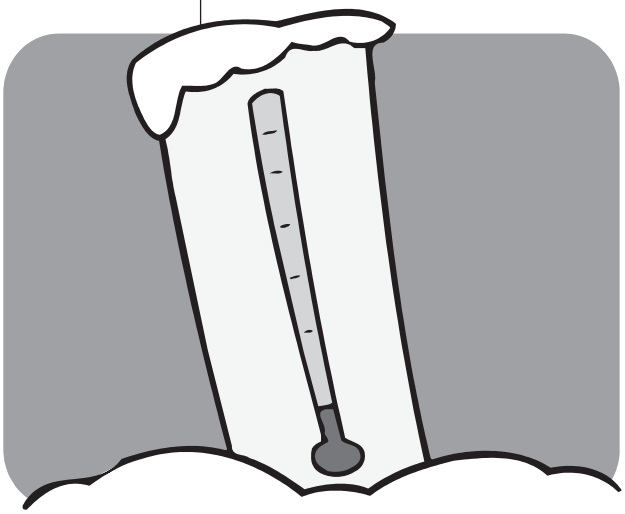
Concepts

- Temperature
- Heat
- States of matter
- Solids
- Liquids
- Gases
- Ice
- Freezing
- Melting
- Evaporation

Teacher Information

- Matter is anything that takes up space and has mass.
- The states of matter refer to the three types or groups of matter most commonly recognized on earth: solids, liquids and gases.
- A solid is matter in which the particles are very close together and cannot move around. Examples of solids include rocks, wood, cotton and ice (frozen water).
- A liquid is matter in which the particles are close together and move around slowly. Examples of liquids include drinking water, mercury at room temperature, and lava (molten rock).
- A gas is matter in which the particles are widely separated, move around freely, and move at high speeds. Examples of gases include the gases we breathe (nitrogen, oxygen, and others), the helium in balloons, and steam (water vapor).

- Heat is a form of energy. It is a source of warmth, for example, to cook something or to keep a building warm or hot.
- Temperature is the measurement of how hot or how cold something is. It is what a thermometer measures.
- Ice is water frozen solid by cold.
- Freeze means to change matter from a liquid state to a solid state due to the removal of heat.
- Freezing is removing heat from a liquid state until it changes state to a solid.
- Melt means to change matter from a solid state to a liquid state due to the addition of heat.
- Melting is when heat is added to a solid until the solid changes state to become a liquid.
- Evaporation is a process in which something is changed from a liquid to a vapor without its temperature reaching the boiling point.

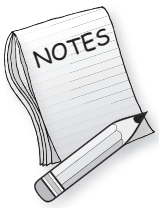


Skills

- Read a thermometer
- Observe
- Measure
- Record data
- Analyze data
- Communicate data
- Draw conclusions

Materials and Resources

1. **BLM7i: Observing Ice** (2 pages)
2. **BLM7ii: Observing Water** (2 pages)
3. Student thermometers – one for each group of two students
4. Clear plastic cup (tumbler size) – one for each group of two students
5. Ice cubes and some crushed ice if possible
6. Paper towels
7. Two 9-ounce clear plastic tumblers
8. Water
9. Two inch rulers with markings of inch and half inch only
10. Two thermometers



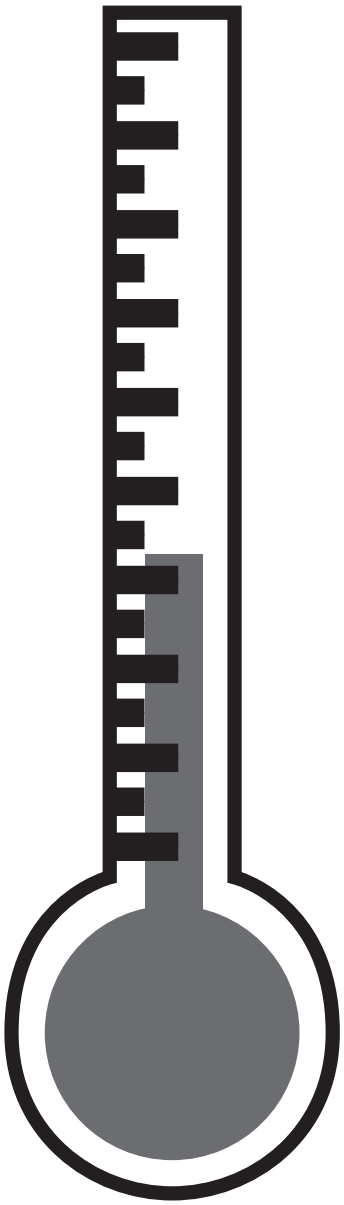
11. Chart paper and black marker
12. A window with sun or a lamp
13. Books on water for first grade, such as the following:
    - *Amazing Water* by Melvin Berger, Newbridge Educational Publishing, 1995. (ISBN#1567841295)
    - *I Am Water* by Jean Marzollo, Cartwheel, 1996. (ISBN#0590265873)

Preparation Activities

1. **Copy BLM7i: Observing Ice** (2 pages) for each student.
2. **Copy BLM7ii: Observing Water** (2 pages) for each student.
3. Prepare the following items for the Introductory Lesson for each group of two students:
   a. One clear plastic cup (tumbler size) filled with ice cubes or crushed ice.
   b. One thermometer
   c. Paper towels
4. Assemble the following supplies for each group of two students for Lesson 1:
   a. One clear plastic cup (tumbler size) filled with ice
   b. One thermometer
   c. Two copies of **BLM7i: Observing Ice** (2 pages)
   d. Pencils/crayons
5. Prepare the following supplies for each group of two students for Lesson 2, Part 1:
   a. Two 9-ounce clear plastic tumblers each filled with two inches of water
   b. Two inch rulers with markings of inch and half inch only.
   c. Two thermometers
   d. Copies of **BLM7ii: Observing Water** (2 pages) for each student.
   e. Pencils
   f. A window with sun or a lamp
6. Have ready chart paper and a black marker.
7. Gather books about water for first grade, such as, *Amazing Water* by Melvin Berger or *I Am Water* by Jean Marzollo

Introductory Activities (20 minutes)

- Arrange the class in groups of two students each.
- Hold up a thermometer.
- Ask students if they know what the object that you are holding is and what it is used for.
- Elicit responses and discuss.
- Write the words *thermometer* and *temperature* on the board and read them aloud.
- Be sure that students know that we use a thermometer to let us know how hot or cold (temperature) something or someplace is.
- Distribute a thermometer to each group of students.
- Ask students to look to see which number the red line has stopped by.
- Explain that that number tells us the temperature of the classroom.
- Pass out to each group of students a clear plastic glass tumbler filled with ice (crushed ice if possible).
- Instruct students to place their thermometer into the tumbler and watch the red line.
- After a minute or two, ask students what happened to the red line.
- Have them read the number where the red line stopped.
- Ask students what the change in temperature from the classroom to the glass of ice tells us.
- Explain that we are going to do some experiments that have to do with temperature and matter.
- Collect materials from students.



Pre-assessment

N/A

Teaching and Learning Activities (2 hours)

Lesson 1

1. Begin this lesson with the class arranged in groups of two students each.

2. Pass out a thermometer to each group of students.

3. Invite students assist in determining the temperature of the classroom.

4. Record the classroom temperature on the board.

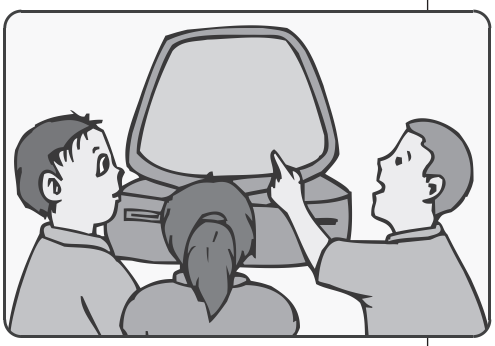
5. Ask students to take out their pencils.

6. Distribute a copy of **BLM7i: Observing Ice**.

7. Record the time on the board.

8. Have students record that time on their recording sheet in Box 1 on the line next to the picture of a clock. (**BLM7i: Observing Ice**)

9. Distribute an ice cube in a clear plastic cup to each group of students, a thermometer and a paper towel.



10. Instruct students to place the thermometer into the cup with ice and have it rest on or against the ice.

11. Then have students to draw a picture of what they see in the cup in Box 1 of **BLM7i: Observing Ice**.

12. Ask students to observe the object in the cup.

13. Guide students' observations with questions such as the following:
    - o What is in the cup?
    - o What group or state of matter does the ice belong to?
    - o Do you think this ice can change to a different state of matter? Accept all answers.
    - o What do you predict will happen to the ice? Accept all responses without confirming or denying their predictions at this time.

14. Now ask students to read the temperature on their thermometers and record that number on the line in Box 1 next to the picture of a thermometer. Assist where needed.
    - o Discuss the various temperatures.

15. Then tell students that the ice was taken from the freezer and placed in their cups. Explain that they will observe the ice over time to see if the ice changes in any way. (If necessary, explain what a freezer is.)

16. Explain that you will set a timer for fifteen (15) minutes. (*Please Note:* The appropriate time interval will vary depending on the size of the ice cube, amount of sunlight, temperature in the room, etc. Choose the interval appropriate for your needs.)

17. Let students know that when the timer rings, students should do the following:
    o Record the time in the Box #2.
    o Record the temperature on the thermometer in the appropriate box.
    o Observe the ice and record (draw) what they see in the appropriate box.

18. Explain that you will continue to set the timer for fifteen (15) intervals and, when the timer rings, you will record the time on the board for students to copy. Students should then proceed to fill in the next box the same way as they did for Box #2.

19. Continue in this way until everyone's ice has melted. There are 8 boxes in **BLM8i: Observing Ice**. Students should only fill in the number of boxes it takes for their ice to melt. Run off more copies of the black line master if more boxes are needed.

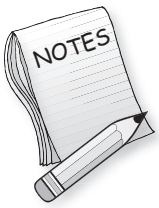
20. During the fifteen (15) minute intervals, gather the class in a meeting area and read and discuss *Amazing Water* by Melvin Berger or *I Am Water* by Jean Marzollo and/or do other class work as the ice will take some time to melt.

21. When everyone's ice has melted, ask students the following questions:
    o What happened to the solid ice in your cups?
    o What kind or state of matter is in your cup now?
    o What happened to the temperature of the ice as it melted?

22. Write the word *melting* on the board.

23. Read the word and ask student what it means.

24. Explain to students that melting is the process by which a solid changes to a liquid.



25. Ask students what they think made the ice change from a solid to a liquid.

26. Assist students with understanding that because the classroom is warmer than the freezer, the ice melted. The warmer temperature or the heat in the classroom caused the ice to melt.

27. Conclude by asking students the following questions:
    - o What caused the solid ice to change from solid matter to a liquid matter? (Adding heat.)
    - o What would you have to do to change the water back into ice? (Take the heat away.)

Lesson 2: Part 1

1. Have the whole class gather in a meeting area and sit in a circle.

2. Place two 9-ounce clear plastic tumbler cups with 2 inches of water in each cup and two rulers marked with inches and half inches only on the floor for students to see.

3. Place a ruler into each cup to show the class that there are 2 inches of water in each cup.

4. Take a black marker pen and make a line at the water level on each cup to indicate the water level.

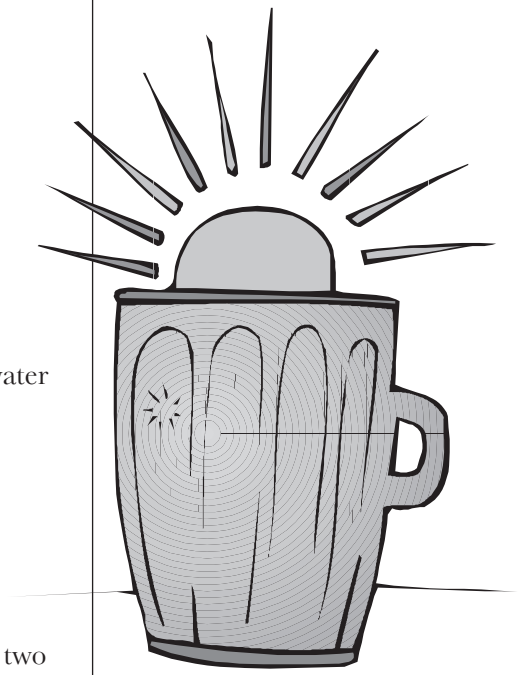
5. Have chart paper and a marker available by the meeting area.

6. Explain to students that one cup of water will be placed in the sunlight (or under a lamp) and the other cup of water will be placed out of the sunlight.

7. Then ask students what they predict will happen to the water in the cups.

8. Record student responses on chart paper.

9. Tell students that each day they will measure the amount of water in each cup and record the amount of water they measure on a recording sheet. (**BLM7ii: Observing Water**)



10. Place the cups in the appropriate areas of the classroom.

11. Have students return to their seats.

12. Distribute a copy of **BLM7ii: Observing Water** to each student.

13. Have students look at the first box with the sun and point to Day 1.

14. Explain to students that the picture of the sun represents the glass of water that was placed in the sun.

15. Then ask them to look at the ruler in Day 1.

16. Review what the markings on the ruler mean.

17. Have students color in the ruler to the two-inch line to represent the two inches of water in the cup.

18. Then have students move across to the next box that reads Day 1, but has a sun with an X on it.

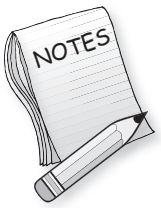
19. Explain that this sun with an X represents the glass of water that was placed where this is no sunlight.

20. Have students color in the ruler to the two-inch line to represent the two inches of water in the cup.

21. Explain to students that they will measure the amount of water in each cup every day and then record that amount on their recording sheet by coloring in the amount on the rulers for that day.

22. Tell students that a thermometer will be placed near each cup of water to determine the temperature of the air around each cup of water. Explain that the teacher will record the temperatures on a chart for students to see.

23. Have pairs of students observe the cups of water each day at approximately the same time each day for about five (5) days. (You may need more days



depending on the amount of sunlight that enters the classroom. Remember to use a lamp if the classroom does not receive direct sunlight.)

Lesson 2: Part 2

1. After five days of recording data on the water levels, ask students to look at their recording sheets and share what happened to the water levels in the cups each day.

2. Compare their results with their previous predictions.

3. Ask students where they think the water went.

4. Write the word *evaporation* on the chalkboard and read it aloud.

5. Explain that evaporation is when matter changes from a liquid to a gas.

6. Water from both cups evaporated and became a part of the air that is around us.

7. Add that the more heat that is around a liquid, the faster evaporation occurs.

8. Point out to students that the water in both cups received heat.

9. Compare the teacher recorded temperatures of the air around each cup of water and ask students the following questions:
   o Which cup received more heat?
   o How do you know?
   o Where did the heat come from that warmed the cup that was away from the light?

10. Conclude by asking students the following questions:
    o What caused the water to change from liquid matter to a gas matter? (Adding heat from the sunlight or lamp.)
    o (AID) What would you have to do to change the gas back into water? (Take the heat away.)

11. Summarize by asking what kind of energy can change water from solid ice to liquid water; from liquid water to gas. (heat)

Products and Assignments

- **BLM7i: Observing Ice** – Students' recording sheets
- **BLM7ii: Observing Water** – Students' recording sheets

Extension Activities

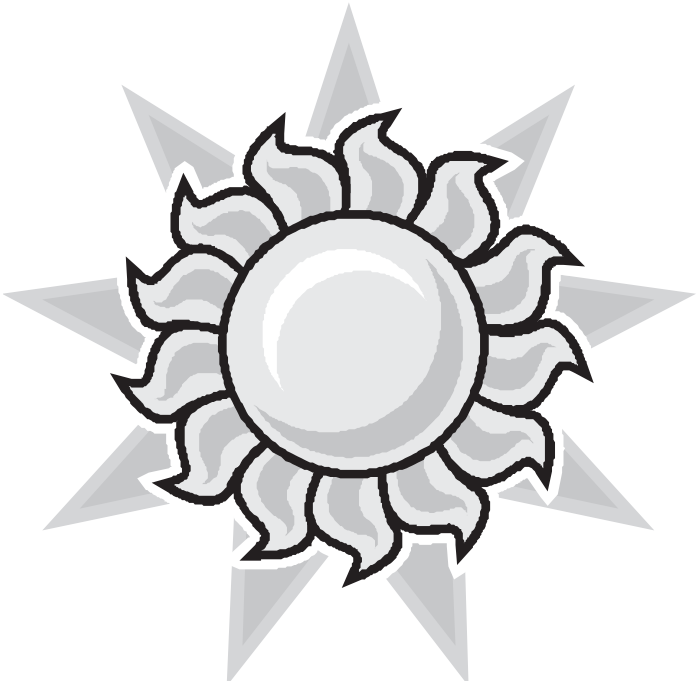
N/A

Post Assessment

N/A

Debriefing and Reflection Opportunities (15 minutes)

- Following the teaching and learning activities, gather the class in a meeting area and ask the following questions:
  - o What other times have you seen solid matter change to liquid matter? (ice cream melting, icicles dripping, candles melting, chocolate melting)
  - o What was needed for each solid to change to a liquid? (heat)
  - o (AID) What other times have you noticed that liquid matter changed to gas matter? (the water in washed clothes drying; rubbing alcohol evaporating from skin)



BLM7i: Observing Ice

Name: _____

Box 1

Box 2

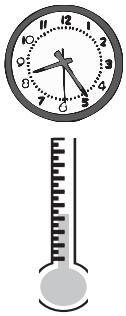
Box 3

Box 4

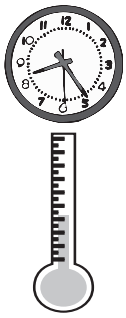
BLM7i: Observing Ice

Name: _____

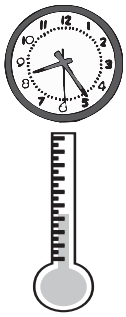
Box 1



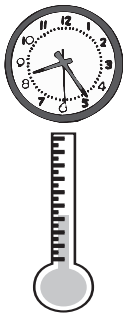
Box 2



Box 3

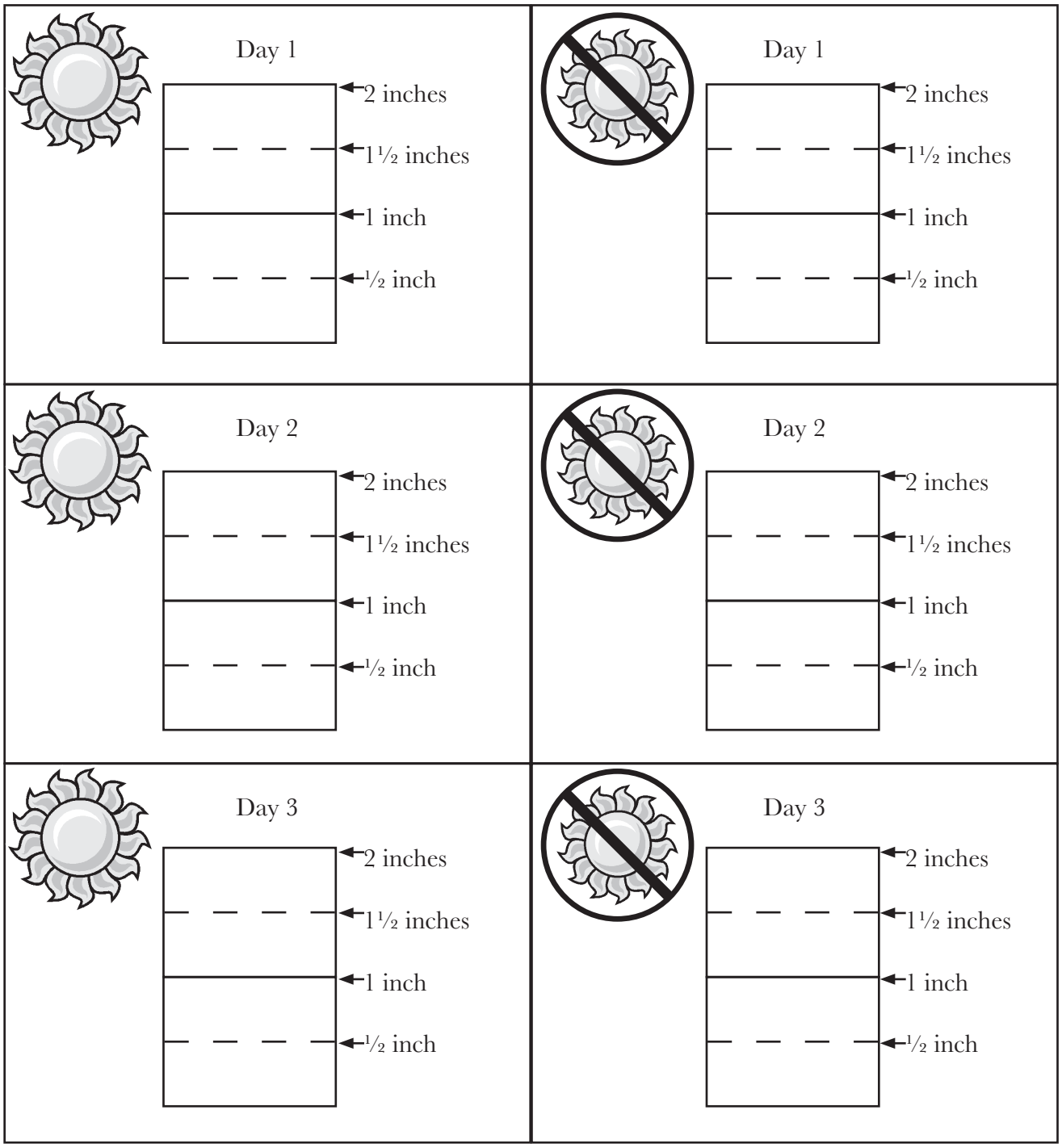


Box 4



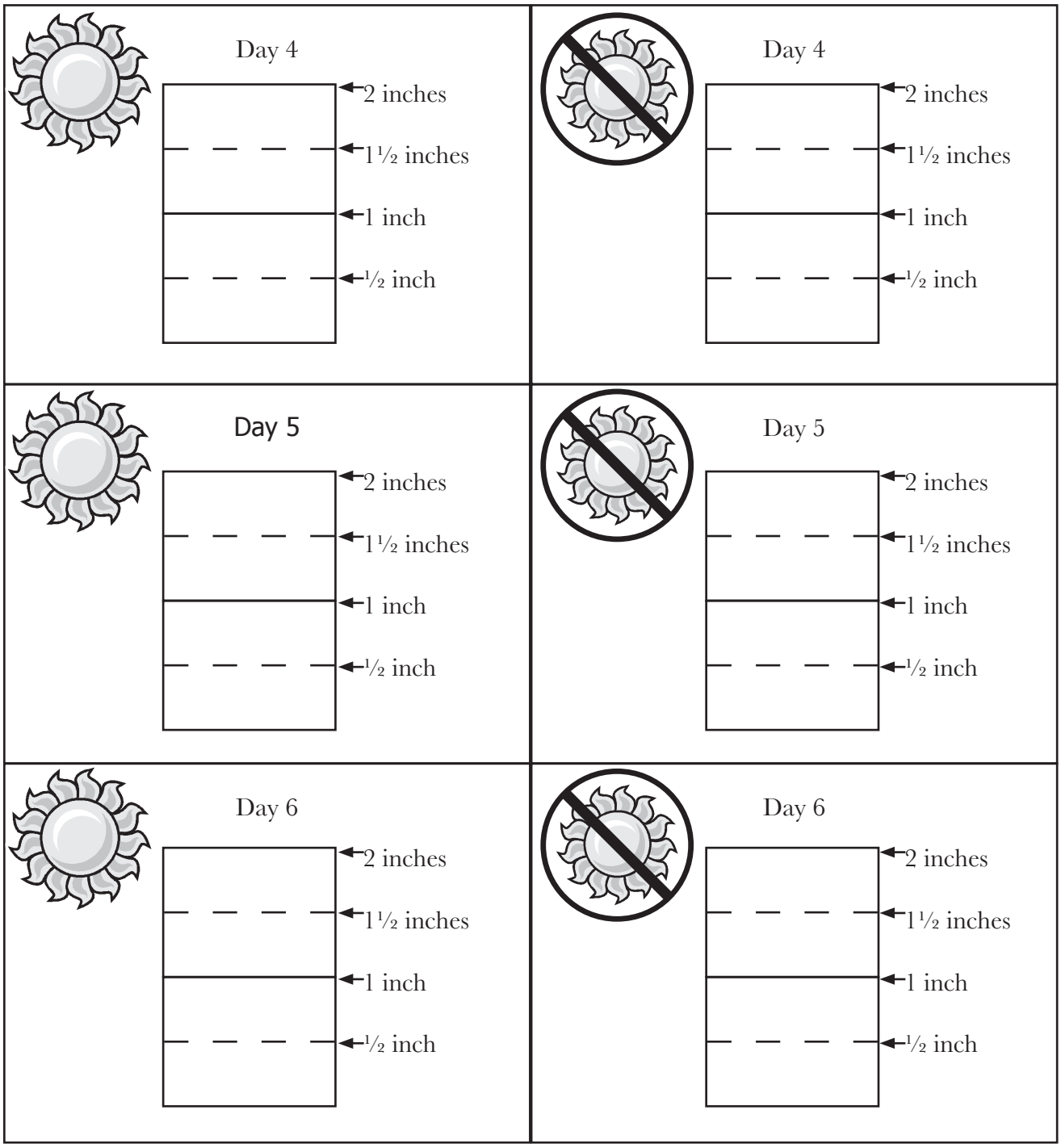
BLM7ii: Observing Ice

Name: _____



BLM7ii: Observing Water

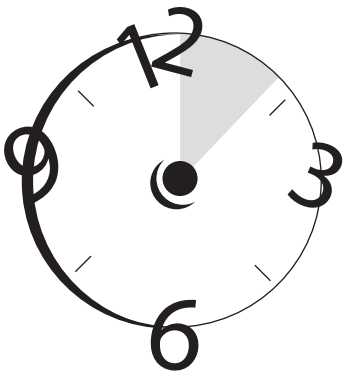
Name: _____



Matter is Made of Different Materials

Core/Connections

Time Allocation: 1 Hour, 30 Minutes
Required Materials and Resources on Page 110



Lesson Overview

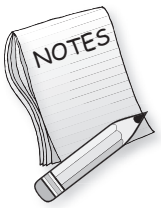
In this module, students will learn about the different kinds of materials that matter is made from. They will be asked to rely on their knowledge of the world to name objects made from wood, metal and plastic. They will also be asked to explore why objects are made from certain materials and how that affects the use of the object. Students will gather data by looking for and cutting out pictures of objects made from a variety of materials. They will record their data by pasting the pictures on paper and then communicating their findings to the class. This module addresses Principle # 9: Matter is made from different materials.

Guiding Questions

- What kinds of materials is matter made from?
- How does the material an object is made from affect the use of the object? (AID)

BIG IDEA

Matter is Made From Many Different Materials



Content Goals

Universal Theme

Form and Function

Principles and Generalizations

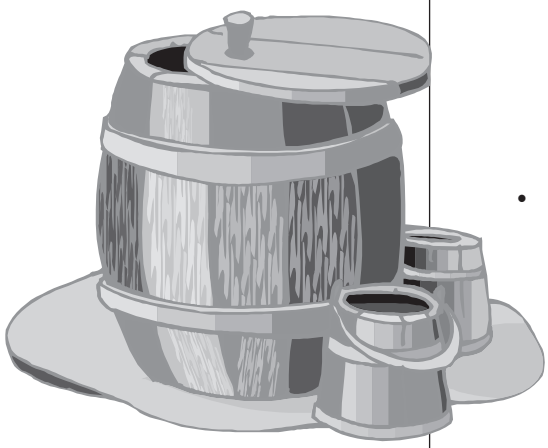
Matter is made from different materials.

Concepts

- Matter
- Material
- Wood
- Metal
- Plastic

Teacher Information

- Matter is anything that takes up space and has mass.
- Material is a property of objects that describes the type of matter that an object is made from.
- Wood is a hard, fibrous, naturally occurring substance. The type of tree from which it is derived classifies it.
- Metals are strong and can be hammered or molded into practically any shape. Whole periods of human civilization - such as the Bronze and Iron ages - are named for metals. These were the first materials to be "engineered," that is, people changed them to fit what they needed to do, rather than just letting their natural properties determine what they could be used for. These days, scientists are using metals in ways no one could have pictured even a few years ago - for example, shaping copper into tiny wires a thousand times skinnier than a strand of your hair!
- Plastics are another material that can be molded into almost any shape. Plastic is the generic name for certain synthetic or semi-synthetic materials that can be molded or extruded into objects or films or filaments or used for making e.g. coatings and adhesives. Plastics vary immensely in heat tolerance, hardness, and resiliency. Combined with this adaptability, the general uniformity of composition and lightness of plastics ensures their use in almost all industrial applications today.



Matter
is Made from Different Materials

Skills

- Observe
- Infer
- Classify
- Gather data
- Record data
- Communicate data

Materials and Resources

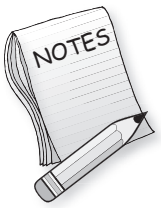
1. **BLM8i: Matter is made from Different Materials**
2. Wooden objects – one or two
3. Metal objects – one or two
4. Plastic objects – one or two
5. Magazines that are appropriate for students to look through and cut out pictures
6. Scissors
7. Glue sticks or paste

Preparation Activities

1. Copy **BLM8i: Matter is made from Different Materials** for each student.
2. Gather at least one wood object, one metal object and one plastic object for display.
3. Collect some appropriate magazines so that each student has a magazine or a section of a magazine that is appropriate for the student to look through and cut out pictures of objects made from various materials.
4. Obtain a pair of scissors for each student.
5. Have available a glue stick or paste for each student.

Introductory Activities (15 minutes)

- Have the whole class gather in a meeting area and sit in a circle on the floor.
- Place a wooden object, a metal object and a plastic object on the floor of the circle for students to see.
- Ask the following questions:
  o Are these objects solids, liquids or gases?
  o How do you know?



- Then say that these objects are the same in one way because they are all solids.
- Next ask: How are these objects different from one another?
- Elicit responses.
- Be prepared to ask questions that will lead students to understand that one of the differences is the material they are made from.
- Write the word *material* on the board and tell students that material means what an object is made from.
- Tell students that we will learn about the different materials from which matter is made.

Pre-assessment

N/A

Teaching and Learning Activities (1 hour)

1. Instruct the class to sit in a whole group arrangement in a meeting area.
2. Hold up a wooden object for students to see.
3. Ask students if the object is a solid, liquid, or gas and why.
4. Ask students if they know what material the object is made from.
5. Elicit responses.
6. Explain that wood is a kind of material that is hard and can be found outside in nature. It can be cut and shaved into many shapes.
7. Ask students why they think wood is a good material to use to make this object.
8. Elicit responses and discuss.

9. Then ask students to name other objects that are made from wood.
10. Elicit responses.

11. Next hold up a metal object and ask students if the object is a solid, liquid or gas and why.

12. Ask students what kind of material the object is made from. (AID)

13. Elicit responses.

14. Explain that metal is a strong material and that it can be hammered or molded into almost any shape when it is heated.

15. Ask students why they think metal is a good material to use to make this object.

16. Elicit responses and discuss.

17. Then ask students to name other objects that are made from metal.

18. Elicit responses.

19. Next hold up a plastic object and ask students if the object is a solid, liquid or gas and why.

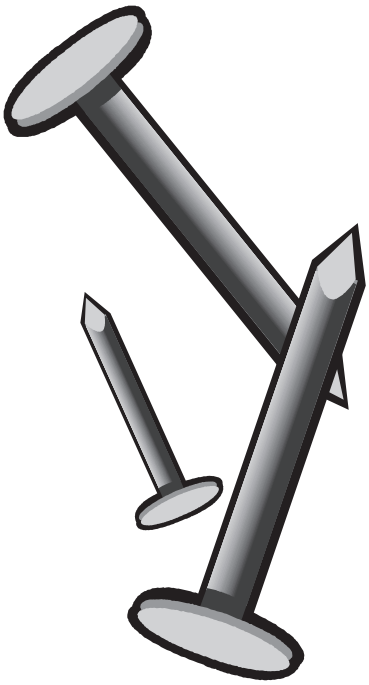
20. Ask students what kind of material the object is made from.

21. Elicit responses.

22. Explain that plastic is another material that can be molded into almost any shape.

23. Ask students why they think plastic is a good material to use to make this object.

24. Elicit responses and discuss.



25. Then ask students to name other objects that are made from plastic.

26. Elicit responses.

27. Ask students if they can name other materials from which objects are made. (i.e., cloth, bricks, glass, stones, leather, rubber)

28. Explain to students that they are going look through magazines to find pictures of objects that are made from different materials such as wood, metal, plastic, cloth, etc.

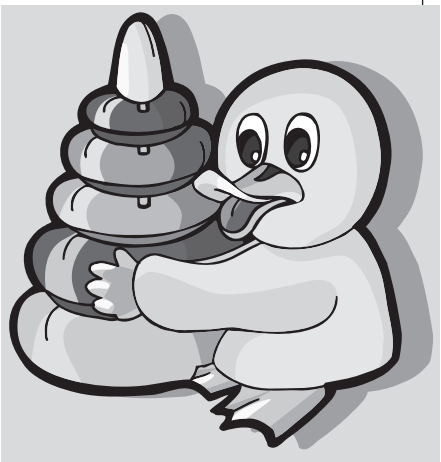
29. Hold up a copy of **BLM8i: Matter is made from Different Materials** and read the heading to the class.

30. Explain that after they cut out their pictures from magazines, they can paste them on their copy of this activity sheet.

31. Pass out or have students pass out magazines, scissors and a copy of **BLM8i: Matter is made from Different Materials** to each student.

32. After students have completed the activity, have them take their papers that they pasted pictures on and gather in a meeting area and sit in a circle.

33. Invite students to share two of the pictures of objects that they pasted on **BLM8i: Matter is made from Different Materials**, telling the class what material the objects are made from.



Products and Assignments
BLM8i: Matter is made from Different Materials

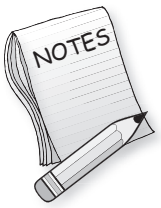
Extension Activities
N/A

Post Assessment
N/A

Debriefing and Reflection Opportunities (15 minutes)

Following the teaching and learning activities, gather the class as a group and ask students the following questions and discuss their responses:

- Why is fabric (cloth) better for clothing than wood or metal?
- Why aren't cars or trucks made from paper?
- Why is paper better for making books than metal?
- Would it be easy to run in sneakers that were made of wood or metal? Why not?
- How does the material an object is made from help the object to work properly? (AID)



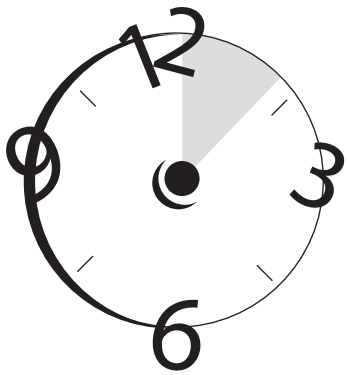
BLM8i: Matter is made from Different Materials

Name: _____

Post Assessment

Core

Time Allocation: 1 Hour
Required Materials and Resources on Page 110



Lesson Overview

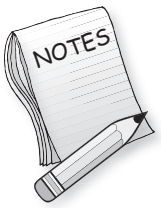
Students take the post assessment for the entire class today.

Guiding Questions

- What do I know about solid matter?
- What do I know about liquid matter?
- What do I know about gaseous matter?

BIG IDEA

What Did I Learn About Matter?



Universal Themes

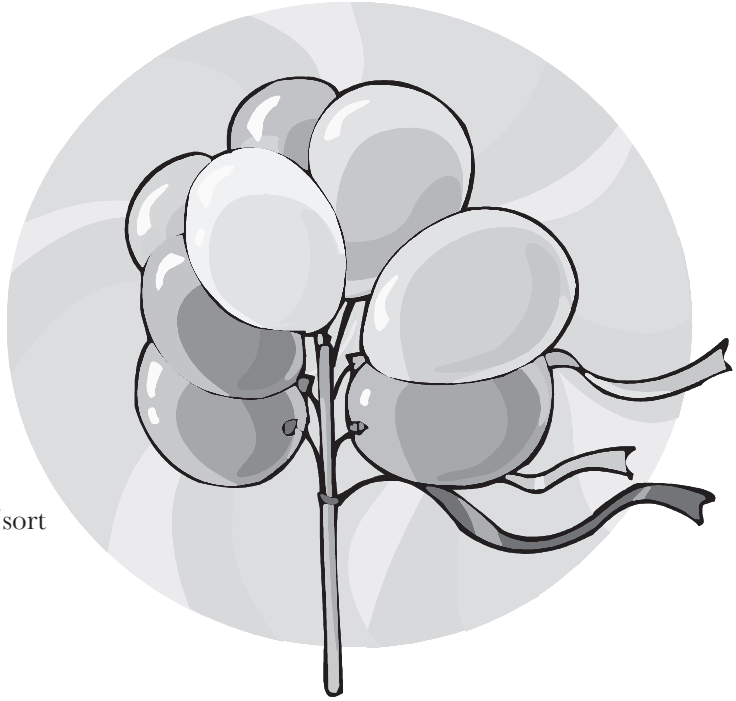
- Evidence, Models, and Explanation

Principles and Generalizations

- Matter is anything that takes up space and has mass.
- All matter has properties.
- Matter can be categorized by its properties.
- Matter occurs in three commonly recognized states: solid, liquid and gas.
- Changes in states of matter generally result from changes in temperature.
- Matter is made from different materials.

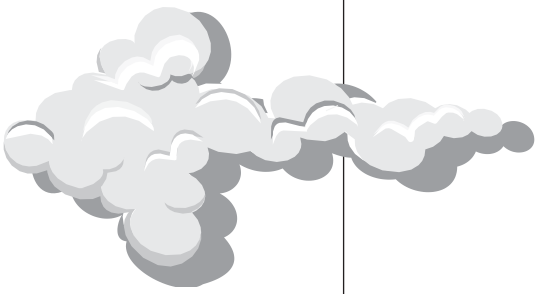
Concepts

- Senses
- Evidence
- Matter
- Space
- Mass
- Properties
- Color
- Shape
- Size
- Texture
- Weight
- Categorize/sort
- Compare
- Contrast
- Same
- Different
- Solid
- Liquid
- Gas
- Measurement
- Matter
- Material



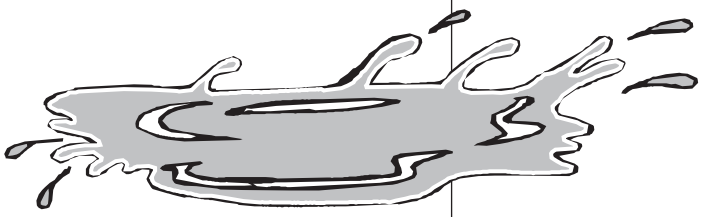
Post Assessment

- Wood
- Metal
- Plastic

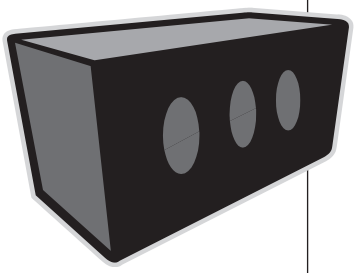


Teacher Information
N/A

Skills
- Identify characteristics
- Compare and contrast
- Categorize/sort
- Draw conclusions
- Apply conclusions to drawings

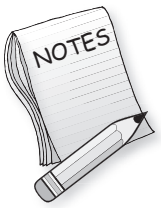


Materials and Resources
1. **BLM Post Assessment: Part 1**
2. **BLM Post Assessment: Part 2**
3. Pictures of matter
4. Crayons
5. Scissors
6. Glue sticks or paste



Preparation Activities
1. Copy **BLM Post Assessment: Part 1** for each student.
2. Copy **BLM Post Assessment: Part 2** for each student.
3. Prepare a sheet of pictures of matter and then copy it for each student. The sheet should have eleven or twelve images that represent solid matter, liquid matter, and gaseous matter. Some suggested images are as follows: a carton of juice, a container of milk, a glass of water, a kitten or puppy, a shirt, a piece of fruit, a ball, a candle (unlit), smoke from a fire, balloons, and a steaming pot.

Introductory Activities (2 minutes)
Explain to students that the activity they will be doing today will be used by you as a tool to measure what they have learned in this unit. Emphasize that they should make their best effort.



Pre-assessment

N/A

Teaching and Learning Activities – Part 1 (28 minutes)

1. Distribute a copy of **BLM Post Assessment**: the prepared sheet with pictures of matter, and **BLM Post Assessment: Part 1** to each student along with a pair of scissors.

2. Explain to students that they are to do the following:
   - Cut out each picture of matter.
   - Sort the pictures into three groups of matter.
   - Paste each group into a box on **BLM Post Assessment: Part 1**.
   - Write the name of the group of matter in each box.
   - Ask you teacher for help in spelling the words.

3. Collect and review their work.

Teaching and Learning Activities – Part 2: (30 minutes)

1. Distribute a copy of **BLM Post Assessment: Part 2** to each student.

2. Have students take out their crayons.

3. Read the directions in each box on **BLM Post Assessment: Part 2** for students.

4. Have students complete the task.

5. Collect and review their work.

Products and Assignments

Students' post assessment results

Extension Activities

N/A

Post Assessment

Post Assessment

BLM Post Assessment: Part 1 & BLM Post Assessment: Part 2

Debriefing and Reflection Opportunities

N/A

BLM Post Assessment: Part 1

Name: _____

BLM Post Assessment: Part 2

Name: _____

Box 1: Draw a picture that shows how you could use solid matter.
Box 2: Draw a picture that shows how you could use liquid matter.
Box 3: Draw a picture that shows how you could use gas matter.

Rubric for Post Assessment Part 1

3 The student was able to accurately sort the pictures of objects into three groups of matter, solids, liquids and gases. The student labeled each group with the appropriate label.

2 The student was able to sort the pictures of objects into three groups of matter, solids, liquids and gases, with one or two mistakes. The student labeled each group with the appropriate label.

1 The student was able to sort the pictures of objects into groups, but not all groups corresponded to solids, liquids and gases. The student made mistakes with labels.

0 The student was unable to complete the task.

Rubric for Post Assessment Part 11

3 The student was able to accurately demonstrate an understanding of the uses of the three common states of matter, solids, liquids and gases.

2 The student was able to accurately demonstrate an understanding of the uses of two of the three common states of matter, solids, liquids and gases.

1 The student was able to accurately demonstrate an understanding of the uses of one of the three common states of matter, solids, liquids and gases.

0 The student was unable to demonstrate an understanding of the uses the three common states of matter, solids, liquids and gases.

“Curriculum Map”

Author: MaryAnn Iadarola
Curriculum Map: The World of Matter
Grade Level: 1

Major Principles and Generalizations	Time Allocation and Parallel	Minor Principles and Generalizations	Concepts	Skills	Themes	Guiding Questions
Pre-assessment	CORE 1 hour	• Matter is anything that takes up space and has mass. • All matter has properties. • Matter can be categorized by its properties. • Matter occurs in three commonly recognized states: solid, liquid, and gas. • Changes in states of matter generally result from changes in temperature. • Matter is made from different materials.	• Senses • Evidence • Matter • Space • Mass • Properties • Color • Shape • Size • Texture • Weight • Categorize/sort • Compare • Contrast • Same • Different • Solid • Liquid • Gas • Measurement • Matter • Material • Wood • Metal • Plastic	• Identify characteristics • Compare and contrast • Categorize/sort • Draw conclusions • Apply conclusions to drawings	• Evidence, Models and Explanation	• What do I know about solid matter? • What do I know about liquid matter? • What do I know about gaseous matter?
1. The world of science is explored and investigated by scientists.	CORE/ PRACTICE/AID 1 hour, 30 minutes	• Children can be scientists	• Science • Scientist • Senses • Evidence	• Observe • Gather evidence • Infer • Communicate data • Draw in a representational way	• Evidence, Models and Explanation	• What is science? • What does a scientist do? • How can children be scientists? • Would you like to be a scientist?

Major Principles and Generalizations	Time Allocation and Parallel	Minor Principles and Generalizations	Concepts	Skills	Themes	Guiding Questions
2. The word *matter* has more than one meaning.	PRACTICE/ CONNECTIONS/ AID 1 hour	• Words that sound the same often have different meanings.	• Matter • Space • Mass	• Listen • Infer • Measure • Record data	• Evidence, Models and Explanation	• What does the word *matter* mean?
3. Matter is anything that takes up space and has mass.	CORE 2 hours	• Living and non-living objects are made up of matter.	• Matter • Living and non-living objects • Space • Mass	• Infer • Observe • Draw in a representational way	• Evidence, Models and Explanation	• What is matter? • Where can matter be found? • What are objects made of?
4. All matter has properties.	CORE 3 hours, 10 minutes	• Properties can be used to describe matter.	• Matter • Properties • Color • Shape • Size • Texture • Weight	• Observe • Infer • Gather data • Record data • Communicate data	• Systems, Order and Organization	• What are the properties of matter? • How can the properties of matter be described?
5. Matter can be categorized by its properties.	CORE/ CONNECTIONS/ AID 1 hour, 30 minutes	• Categorizing creates an order that makes understanding easier.	• Categorize/sort • Compare • Contrast • Same • Different	• Categorize/sort • Observe • Compare • Contrast • Infer	• Systems, Order and Organization	• What does it mean to categorize (sort) matter? • How can matter be categorized (sorted)? • How does categorizing (sorting) matter make understanding easier?

Major Principles and Generalizations	Time Allocation and Parallel	Minor Principles and Generalizations	Concepts	Skills	Themes	Guiding Questions
6. Matter occurs in three commonly recognized states: solid, liquid and gas.	CORE/ CONNECTIONS 2 hours, 30 minutes	• Each state of matter has unique characteristics. • Matter can be measured.	• States of Matter • Solid • Liquid • Gas • Measurement • Shape • Size (Volume)	• Observe • Predict • Measure data • Gather data • Record data • Communicate data • Categorize • Infer	• Systems, Order and Organization	• What are the characteristics of solid matter? • What are the characteristics of liquid matter? • What are the characteristics of gas matter?
7. Changes in states of matter generally result from changes in temperature.	CORE/ CONNECTIONS 2 hours, 35 minutes		• Temperature • Heat • States of Matter • Solids • Liquids • Gases • Ice • Freezing • Melting • Evaporation	• Read a thermometer • Observe • Measure • Record data • Analyze data • Communicate data • Draw conclusions	• Constancy, Change and Measurement • Energy	• Can matter change from one state to another? • What causes matter to change state?
8. Matter is made from different materials.	CORE 1 hour, 30 minutes		• Matter • Material • Wood • Metal • Plastic	• Observe • Infer • Classify • Gather data • Record data • Communicate data	• Form and Function	• What kinds of materials is matter made from? • How does the material an object is made from affect the use of the object? (AID)
Post Assessment	CORE 1 hour	• Matter is anything that takes up space and has mass. • All matter has properties. • Matter can be categorized by its properties. • Matter occurs in three commonly recognized states: solid, liquid, and gas. • Changes in states of matter generally result from changes in temperature. • Matter is made from different materials	• Senses • Evidence • Matter • Space • Mass • Properties • Color • Shape • Size • Texture • Weight • Categorize/sort • Compare • Contrast • Same • Different • Solid • Liquid • Gas • Measurement • Matter • Material • Wood • Metal • Plastic	• Identify characteristics • Compare and contrast • Categorize/sort • Draw conclusions • Apply conclusions to drawings	• Evidence, Models, and Explanation	• What do I know about solid matter? • What do I know about liquid matter? • What do I know about gaseous matter?

“Materials and Resources”

Lesson	Primary Materials	Additional Materials (Supplied by Teacher)
Pre-assessment	Crayons (30 boxes)	Ten to twelve objects in a variety of shapes, colors, sizes, textures, and weights
1	Easel, chart paper, opaque lunch bags: one for every two students or adult socks can be used, drawing paper 9" x 12" for each student, pencils or crayons	A variety of objects, i.e., small balls (hard and soft), block, cotton ball, bottle cap, small piece of sponge, pen, coin, toy, car, toy animal, etc. Have enough different objects to place one in each sock or bag.
2	Easel, chart paper, marker, pan-balances for the AID extension activity, gram weights for the AID extension activity, graph paper (1") for the AID extension activity, crayons	A book (any book will do), a toy, pictures that show the different meanings of words that have more than one meaning (i.e., fly, bill)
3	Easel, chart paper, marker, drawing paper 9" x 12" for each student, crayons, scissors, tape, construction paper 9" x 12" for each child	A book, a glass or plastic bottle of water, an air-filled balloon
4	Yellow pencil, marker, plastic bags (5 for each group of two students), opaque bags (1 for each group of four students doing the extension activity), a crayon, a pair of scissors, pan balances (one for each group of four students), white construction paper 12" x 18" (four pieces for each student)	Properties of Matter word chart, one playground ball, one tennis ball, one marble, one rock, five or six objects of various colors (i.e., blocks, balloons, buttons, marbles, shells, plastic spoons, corks, feathers, rocks, rubber bands, coarse sandpaper, etc.) for each group of two students, five or six objects of various sizes for each group of two students, five or six objects of various shapes for each group of two students, five or six objects of various textures for each group of two students (Include a block, cotton, sandpaper, a rough rock, a smooth rock, and other textures), objects of various weights for each group of four students
5	White construction paper 12" x 18" for each pair of students, scissors, plastic bags (one for each pair of students), color tiles (or if tiles are not available, cut out paper squares that are the same size from red, yellow, blue, and green, construction paper), yellow, green, red, and blue construction paper if tiles are not available, pattern blocks (AID extension activity)	Properties of Matter word chart, objects of various colors, sizes, shapes, textures and weights (i.e., blocks, balloons, buttons, marbles, shells, plastic spoons, corks, feathers, rough and smooth rocks, rubber bands, coarse sandpaper, cotton, etc. – about 15 assorted items per pair of students)

Lesson	Primary Materials	Additional Materials (Supplied by Teacher)
6	White construction paper 12" x 18" – 2 pieces for each pair of students, plastic bags, one of each pair of students, materials for plastic bags (one set for each pair of students) – one crayon, one 5 x 5 centimeter piece of cloth, one centimeter ruler or several small paper clips, depending on whether students are using standard or non-standard units of measurement, clear plastic containers, one liter size for each pair of students, stapler, chart paper, marker, crayons, pencils for each student, o, lined composition paper, magnifiers (AID extension activity), 9 oz. or larger plastic cups, one-cup measure for each pair of students, paper towels, balloons of various sizes and shapes (one for each pair of students), string (8" piece for each pair of students), lunch size paper bags (one for each pair of students), 9 x 12" blue construction paper (1 piece for each pair of students), two magnifiers	Cotton balls (AID extension activity), one cup with a spoonful of sugar (AID extension activity), one cup with a spoonful of granular instant coffee (AID extension activity), toothpicks
7	Chart paper, marker, tape, a few sheets of yellow, blue and red construction paper	Solid objects, glass of water, balloon filled with air
8	Student thermometers (one for each pair of students), clear plastic cups (one for each pair of students + two for demonstration), paper towels, rulers (2" with markings of inch and half inch only – one for each pair of students), chart paper, marker, resource books on water such as the following: Berger, Melvin. (1995). *Amazing water.* Newbridge Educational Publishing. (ISBN#1567841295) Marzollo, Jean. (1996). *I am water*. Cartwheel. (ISBN#0590265873)	Ice cubes and some crushed ice, water
9	Wooden objects (one or two), metal objects (one or two), plastic objects (one or two), magazines that are appropriate for students to look through and cut out pictures, scissors (one pair for each student), glue sticks or paste (for each student),	
Post-assessment	Crayons for each student, scissors for each student, Glue sticks or paste for each student	