Lesson 1 - What are the Properties of Matter?

Who
This lesson is designed for fifth graders ranging in age from nine to eleven.

What
This lesson is part of the Physical Science Unit of Instruction and based on California State Standards.

How Long
This lesson will take place during two 75 minutes sessions.

Description
In this lesson the learners will:

- Know what the properties of matter are;
- know what makes up matter; and
- know properties change during a chemical reaction.

California State Content Standards Covered in this Lesson

**5PS1.a** Students know that during chemical reactions the atoms in the reactants rearrange to form products with different properties.

**5IE6.f** Select appropriate tools (e.g., thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations.

**5IE6.h** Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion.

**5PS1.0** Elements and their combinations account for all the varied types of matter in the world. As a basis for understanding this concept:

**5PS1.h** Students know living organisms and most materials are composed of just a few elements.

National Educational Technology Standards for Learners

1. Basic Operations and Concepts – Students a. demonstrate a sound understanding of the nature and operation of technology systems.

3. Technology Productivity Tools – Students a. use technology to enhance learning, increase productivity, and promote creativity. b. use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.
Instructional Objectives

• Students identify the few elements that make up most kinds of matter.

• Students compare the physical and chemical properties of different kinds of matter.

Instructional Procedures

Lesson Set
This unit will be introduced with up warm up activity that will activate prior knowledge. The question “What makes up everything around us?” will be written on the Interwrite board when the students return to the classroom after lunch. They will talk in their small groups for a few minutes and each group will come up with a short answer. They will then be asked to describe objects in the classroom. They will be encouraged to use adjectives that successfully describe various objects.

The students will receive a handout with the list of goals written in the form of questions for this unit.

The students will take part in a directed inquiry that will answer the question “How can properties change during a chemical reaction?”

Directed Inquiry:
Students will:
1. Put 100 ml. of cold water and a thermometer in a cup. Put 100 ml. of warm water and a thermometer in another cup.

2. After 1 minute record temperature.

3. Add 2 fizzy antacid tablets to each cup.

4. Observe and record any changes.

After the directed inquiry, students will discuss in their small groups the way temperature affected the speed of the reactions and draw or infer a conclusion.

Techniques and Activities

Students will buddy read with their shoulder partner pages 9 through 11 in the Science text book. They will discuss the pictures of icicles and a fire.

The class will review whole group the physical and chemical properties of objects
shown in the two pictures. We will discuss the fact that a melting icicle appears to change form. Students will be encouraged to recognize that ice and liquid water are the same substance, but wood and ash are not.

**Ask:** If water is boiled in a kettle, water vapor is formed. Is this a physical or a chemical change? *It is a physical change.*

Students will complete the worksheet (from Scott Foresman and reproduced at the end of this lesson) as they read through Lesson One.

**Lesson Closure**
Students will write a concluding paragraph that summarizes the main ideas in Lesson 1. Remind students that elements are identified by their properties and include specific supporting details when writing their concluding paragraph.

**Adaptations for Special Learners**
Have students preview the title and headings on the pages. Display how to make a skeleton outline for the section. Write the lesson titles as major divisions and subheadings at the next level.

Model how to fill in the main idea and details under each heading.

After students have completed each lesson, review it as a class to make sure they have included all vocabulary definitions and key concepts.

**Supplemental Activities**
Students will create two slides using Pixie software. The first will be on physical properties and the second on chemical properties. Each slide will contain a summary paragraph and illustration. At the end of this unit the slides will be turned into a movie.

**Assessment**

**Formal Evaluation**
- Lesson One Quiz *(from Scott Foresman and reproduced at the end of this lesson)*
- Written Concluding Paragraph
- Pixie slides

**Informal Evaluation**
- Artifacts created on the Extra tab
- Observation of how well students read with shoulder buddy

**Learner Products**
- Pixie Slides
- Extra Artifacts
What are properties of matter?
Describe matter by defining the following and give examples of each.

Physical property
Definition:
Examples:

Chemical Property
Definition:
Examples:

Element
Definition:
Examples:

Notes for Home: Your child defined and gave examples of the physical and chemical properties of matter. Have your child identify physical properties of an item you hold up. Challenge your child to name at least 6 properties.
Reviewing Terms: Matching
Match each definition with the correct term. Write the letter on the line
next to the definition.

1. properties that describe how substances react to form new substances
   a. chemical properties

2. properties that can be seen without changing the material
   b. elements

3. basic kinds of matter
   c. physical properties

Reviewing Concepts: Sentence Completion
Complete each sentence with the correct word or phrase.

4. Metals such as aluminum and copper are _____ (pure, mixed)

5. The ____ of an object changes when the pull of gravity changes. (mass, weight)

6. Use a ____ when measuring the mass of an object. (balance, spring scale)

7. Whether a substance is magnetic is a _____. (physical property, chemical property)

8. The ability of a material to burn is a ____. (physical property, chemical property)

Applying Concepts
9. Write one physical and one chemical property of iron. Explain why understanding these properties is important. (2 points)

   _______________________________________________________________
   _______________________________________________________________
   _______________________________________________________________
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   b. elements  
   c. physical properties

2. properties that can be seen without changing the material
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   b. elements  
   c. physical properties

3. basic kinds of matter

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Applying Concepts
9. Write one physical and one chemical property of iron. Explain why understanding these properties is important. (2 points)
   physical property: dense, durable; chemical property: will rust in presence of oxygen and water; Sample answer: Knowing the properties of iron is important because iron is used to make buildings and cars.