Classification of Matter

Section 1  Composition of Matter

**Predict** Read the title of Section 1. List three things that might be discussed in this section.

1. 
2. 
3. 

**Review Vocabulary** Circle the phrase that comes closest to the meaning of the word property as it is used in your book.

- property
  - a piece of land
  - something that is owned
  - a quality or attribute
  - a stage prop

**New Vocabulary** Use the terms on the left to fill in the blanks in the sentences.

- colloid
  - A __________ is an __________ if all the atoms in the substance are the same.

- compound
  - A __________ is a substance in which two or more elements are combined in a fixed proportion.

- element
  - A __________ contains two or more substances blended evenly throughout.

- heterogeneous mixture
  - A __________ is a mixture in which different materials can easily be distinguished.

- homogeneous mixture
  - A __________ is a homogeneous mixture of particles too small to see with a microscope and too small to settle.

- solution
  - The __________ is observed when light passes through a __________, which is a mixture with particles visible under a microscope but not heavy enough to settle.

- Tyndall effect
  - A __________ is a heterogeneous mixture containing a liquid in which you can see particles settle.

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Section 1 Composition of Matter (continued)

Main Idea

Substances
Classify each substance as an element or a compound.
calcium, chalk, hydrogen, salt, water,
carbon, chlorine, mercury, sodium, zinc,
carbon dioxide, copper, oxygen, sugar.

<table>
<thead>
<tr>
<th>Elements</th>
<th>Compounds</th>
</tr>
</thead>
</table>

Details

Mixtures
Organize information about mixtures in the outline below.

I. Mixtures

A. Heterogeneous mixtures
   1. 
   2. 
   3. 
   4. Examples: 

B. Homogeneous mixtures
   1. 
   2. 
   3. 
   4. Examples: 

C. Colloids
   1. 
   2. 
   3. 
   4. 
   5. Examples: 
Section 1 Composition of Matter (continued)

Main Idea

Mixtures
I found this information on page ____________

Details

**Sequence the types of mixtures according to particle size.**

<table>
<thead>
<tr>
<th></th>
<th>colloids</th>
<th>solutions</th>
<th>suspensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Largest particles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smallest particles</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compare and contrast colloids, solutions, and suspensions. Write the characteristics of each in the table.

<table>
<thead>
<tr>
<th></th>
<th>colloids</th>
<th>solutions</th>
<th>suspensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>particles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>appearance</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Predict what an observer who looks directly into a light source through a colloid will see.

SYNTHESIZE IT

Classify each substance as a solution, a colloid, or a suspension. Write each name in one of the boxes below.

- herbed salad dressing
- paint
- pulpy orange juice
- tea
- milk
- perfume
- smoke
- vinegar

<table>
<thead>
<tr>
<th>colloids</th>
<th>suspensions</th>
<th>solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Classification of Matter
Section 2  Properties of Matter

Skim Section 2 of your book. Write three questions that come to mind from reading the headings and the illustration captions.
1. 
2. 
3. 

Review Vocabulary
boiling point

Use the phrase boiling point in a sentence.

New Vocabulary

Read the definitions below, then write the key term for each one in the left column.

a characteristic that can be observed without changing the substance

a change in size, shape, or state of matter

a change of one substance to another

a characteristic that indicates whether a substance can change to another substance

the separation of substances in a mixture using evaporation

the mass of all substances before a chemical change equals the mass of all substances after the change

Academic Vocabulary
identify

Use a dictionary to define the word identify.
Section 2 Properties of Matter (continued)

Main Idea

Physical Properties
I found this information on page ___________.

Physical Change
I found this information on page ___________.

Chemical Properties and Changes, Detecting Chemical Change
I found this information on page ___________.

Details

Distinguish between the materials listed below. Describe a unique physical property for each one that is not true for the other materials in this group.

<table>
<thead>
<tr>
<th>Material</th>
<th>Unique physical property</th>
</tr>
</thead>
<tbody>
<tr>
<td>rubber</td>
<td></td>
</tr>
<tr>
<td>applesauce</td>
<td></td>
</tr>
<tr>
<td>marble</td>
<td></td>
</tr>
<tr>
<td>copper</td>
<td></td>
</tr>
</tbody>
</table>

Describe how freezing could be used to remove sugar from a mixture of sugar and water.

Identify four properties of a substance that will never change.

Organize five kinds of physical changes and five kinds of chemical changes.

<table>
<thead>
<tr>
<th>Chemical</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Section 2  Properties of Matter (continued)

Main Idea

Weathering—Chemical or Physical Change?
I found this information on page …

Details

Identify chemical and physical changes that occur as a car ages.

<table>
<thead>
<tr>
<th>Physical Changes</th>
<th>Chemical Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Conservation of Mass
I found this information on page …

Describe how the law of conservation of mass could be useful for investigating chemical changes.

CONNECT IT

Describe some ways that industry and agriculture use physical properties to separate substances.