Physical and Chemical Changes and Properties of Matter Worksheet

Classify the following as chemical change (cc), chemical property (cp), physical change (pc), or physical property (pp).

1. PP Heat conductivity
2. cc Silver tarnishing
3. pc sublimation
4. pc magnetizing steel
5. PP length of metal object
6. pc shortening melting
7. cc exploding dynamite
8. cp Combustible
9. pc Water freezing
10. cc Wood burning
11. cp Acid resistance
12. pp Brittleness
13. cc Milk souring
14. cc baking bread

Identify the following as being true or false to the left of the sentence.

_ T _ 15. A change in size or shape is a physical change.
_ T _ 16. A chemical change means a new substance with new properties was formed.
_ F _ 17. An example of a chemical change is when water freezes.
_ T _ 18. When platinum is heated, then cooled to its original state, we say this is a physical change.
_ F _ 19. When milk turns sour, this is a physical change because a change in odor does not indicate a chemical change.
_ T _ 20. When citric acid and baking soda mix, carbon dioxide is produced and the temperature decreases. This must be a chemical change.

Identify each of the following as a physical or chemical change.

21. cc You leave your bicycle out in the rain and it rusts.
22. pc A sugar cube dissolves.
23. cc Scientist break-up water into oxygen and hydrogen gas.
24. cc Burning coal for a barbecue.
25. pc Trimming a bush because it has grown too tall.
Classifying Matter Worksheet

Classify each of the following substances as an element, a compound, a solution (homogenous mixture, or a heterogeneous mixture).

1. Sand - Heterogeneous Mixture
2. Salt - Compound
3. Pure Water - Compound
4. Soil - Heterogeneous Mixture
5. Soda just opened - Homogeneous Mixture
6. Pure air - Heterogeneous Mixture
7. Carbon Dioxide - Compound
8. Gold - Element
9. Brass - Homogeneous Mixture
10. Oxygen - Element
11. Italian Salad Dressing - Heterogeneous Mixture
12. Salt Water - Homogeneous Mixture
13. Raisin Bran - Heterogeneous Mixture
14. Silver - Element
15. Lithium Iodide - Compound
16. Apple Pie - Homogeneous Mixture
17. Kool Aid - Homogeneous Mixture
18. Sugar Water - Homogeneous Mixture
19. Chocolatechip Cookie - Heterogeneous Mixture
20. Gatorade - Homogeneous Mixture
21. Gold - Element
22. tacos - Heterogeneous Mixture
23. Lead - Element
24. Cesar Salad - Heterogeneous Mixture
25. Calcium - Element
26. Whole Milk - Homogeneous Mixture
27. Skim Milk - Homogeneous Mixture
28. hydrogen peroxide - Compound
29. Potassium - Element
30. Sugar - Compound
31. Raisin Bran Cereal with Milk - Heterogeneous Mixture
32. Raisin Bran Cereal without Milk - Heterogeneous Mixture
Physical and Chemical Properties Worksheet

Classify the following properties as either chemical or physical by checking the appropriate column.

<table>
<thead>
<tr>
<th>Property</th>
<th>Physical property</th>
<th>Chemical property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue color</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Density</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Flammability</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Dissolves in water</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Boils at 100 degrees</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Scratches glass</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Sour taste</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Rusting</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Exploding fireworks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melting point</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Reacts with H₂O to form gas</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Reacts with something to form H₂O</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Hardness</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Boiling point</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Luster (shine)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Odor</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
Identify each of the following as an example of a physical property or a chemical property.

1. Silver tarnishes when it comes in contact with hydrogen sulfide in the air.  
   Chemical

2. A banana is yellow.  
   Physical

3. A sheet of copper can be pounded into a bowl.  
   Physical

4. Barium melts at 725 C.  
   Physical

5. Gasoline is flammable.  
   Chemical

6. A diamond is the hardest natural substance.  
   Physical

7. Helium does not react with any other element.  
   Chemical

8. A bar of lead is more easily bent than is a bar of aluminum of the same size.  
   Physical

9. Potassium metal is kept submerged in oil to prevent contact with oxygen or water.  
   Chemical

10. An apple will turn brown is left in oxygen.  
    Chemical

11. Diamond dust can be used to cut or grind most other materials.  
    Physical

12. Acid in tomato sauce can corrode aluminum foil.  
    Chemical

13. Rocks containing carbonates can be identified because they fizz when hydrochloric acid is applied.  
    Chemical

14. A piece of charcoal, which is mostly the substance carbon, glows red, gives off heat, and becomes a gray ash.  
    Chemical
**Physical and Chemical Changes**

**Part A**
Can you recognize the chemical and physical changes that happen all around us? If you change the way something looks, but haven’t made a new substance, a physical change (P) has occurred. If the substance has been changed into another substance, a chemical change (C) has occurred.

1. **P** An ice cube is placed in the sun. Later there is a puddle of water. Later still the puddle is gone.
2. **C** Two chemical are mixed together and a gas is produce.
3. **C** A bicycle changes color as it rusts.
4. **P** A solid is crushed to a powder.
5. **C** Two substances are mixed and light is produced.
6. **C** A piece of ice melts and reacts with sodium.
7. **P** Mixing salt and pepper.
8. **P** Chocolate syrup is dissolved in milk.
9. **C** A marshmallow is toasted over a campfire.
10. **P** A marshmallow is cut in half.
### Part B
Read each scenario. Decide whether a physical or chemical change has occurred and give evidence for your decision. The first one has been done for you to use as an example.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Physical or Chemical Change?</th>
<th>Evidence...</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Umm! A student removes a loaf of bread hot from the oven. The student cuts a slice off the loaf and spreads butter on it.</td>
<td>Physical</td>
<td>No change in substances. No unexpected color change, temperature change or gas given off.</td>
</tr>
<tr>
<td>2. Your friend decides to toast a piece of bread, but leaves it in the toaster too long. The bread is black and the kitchen if full of smoke.</td>
<td>Chemical</td>
<td>Substance changes, color change, taste change.</td>
</tr>
<tr>
<td>3. You forgot to dry the bread knife when you washed it and reddish brown spots appeared on it.</td>
<td>Chemical</td>
<td>Rust is a chemical change, iron to iron oxide.</td>
</tr>
<tr>
<td>4. You blow dry your wet hair.</td>
<td>Physical</td>
<td>Water evaporates</td>
</tr>
<tr>
<td>5. In baking biscuits and other quick breads, the baking powder reacts to release carbon dioxide bubbles. The carbon dioxide bubbles cause the dough to rise.</td>
<td>Chemical</td>
<td>Gas formation means chemical change, new substance formed</td>
</tr>
<tr>
<td>6. You take out your best silver spoons and notice that they are very dull and have some black spots.</td>
<td>Chemical</td>
<td>Black spots are tarnish (silver version of rust), new substance formed</td>
</tr>
<tr>
<td>7. A straight piece of wire is coiled to form a spring.</td>
<td>Physical</td>
<td>No new substance, only a new shape.</td>
</tr>
<tr>
<td>8. Food color is dropped into water to give it color.</td>
<td>Physical</td>
<td>No new substance.</td>
</tr>
<tr>
<td>9. Chewing food to break it down into smaller particles represents a ______ change, but the changing of starch into sugars by enzymes in the digestive system represents a ______ change.</td>
<td>Physical, Chemical</td>
<td></td>
</tr>
<tr>
<td>10. In a fireworks show, the fireworks explode giving off heat and light.</td>
<td>Chemical</td>
<td></td>
</tr>
</tbody>
</table>

### Part C: True (T) or False (F)

1. **F** Changing the size and shapes of pieces of wood would be a chemical change.
2. **F** In a physical change, the makeup of matter is changed.
3. **T** Evaporation occurs when liquid water changes into a gas.
4. **T** Evaporation is a physical change.
5. **F** Burning wood is a physical change.
6. **F** Combining hydrogen and oxygen to make water is a physical change.
7. **T** Breaking up concrete is a physical change.
8. **F** Sand being washed out to sea from the beach is a chemical change.
9. **F** When ice cream melts, a chemical change occurs.
10. **F** Acid rain damaging a marble statue is a physical change.
Worksheet #2: Physical/Chemical Properties/Changes

I. Fill in the Blanks

Physical ___ properties can be observed without chemically changing matter. Chemical ___ properties describe how a substance interacts with other substances. Solids ___ have definite shapes and definite volumes. Liquids ___ have indefinite shapes and definite volumes. Gases ___ have indefinite shapes and indefinite volumes.

Phase changes are ___ Physical ___ changes. Freezing ___ point is the temperature at which a liquid turns to a solid. It is also equal to the melting ___ point which is the temperature at which a solid ___ turns to a liquid. Boiling ___ point is the temperature at which a liquid turns to a gas, and condensing ___ point is the temperature at which a gas turns to a liquid. Occasionally, a solid turns directly into a gas without turning into a liquid first. This is called ___ sublimation ___.

II. Label these properties as chemical (C) or physical (P). Be certain to know the definition of each of these properties.

<table>
<thead>
<tr>
<th>combustibility</th>
<th>C</th>
<th>density</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>malleability</td>
<td>P</td>
<td>tendency to corrode</td>
<td>C</td>
</tr>
<tr>
<td>weight</td>
<td>P</td>
<td>volume</td>
<td>P</td>
</tr>
<tr>
<td>failure to react</td>
<td>C</td>
<td>melting point</td>
<td>P</td>
</tr>
<tr>
<td>ductility</td>
<td>P</td>
<td>odor</td>
<td>P</td>
</tr>
<tr>
<td>texture</td>
<td>P</td>
<td>flammability</td>
<td>C</td>
</tr>
</tbody>
</table>

III. Label these changes as chemical (C) or physical (P).

| digestion of food | C | explosions          | C |
| getting a haircut | P | lighting a candle   | C |
| evaporation       | P | tarnishing silver   | C |
| ice cube melting  | P | formation of acid rain | P |
| crushing rocks    | P | dissolving salt in water | P |
**WORKSHEET ON CHEMICAL VS PHYSICAL PROPERTIES AND CHANGES**

Keep this in your binder as a study guide! You will have a quiz on this next class!

**Background:** Keeping the difference between physical and chemical properties as well as changes can be a challenge! This worksheet will help you do this. First, use the book to define the following terms.

<table>
<thead>
<tr>
<th>VOCABULARY WORD</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Property</td>
<td>Description using senses or measurement</td>
</tr>
<tr>
<td>Physical Change</td>
<td>Change in which the identity of the substance does NOT change</td>
</tr>
<tr>
<td>Chemical Property</td>
<td>Description of possible interactions</td>
</tr>
<tr>
<td>Chemical Change</td>
<td>Change in which a new substance is formed</td>
</tr>
</tbody>
</table>

**Part One:** Physical or Chemical Property? Fill in the chart using the vocabulary words or phrases provided.

Vocabulary words

<table>
<thead>
<tr>
<th>Boiling point</th>
<th>Ability to rust</th>
<th>Melting point</th>
<th>Brittleness</th>
<th>Reactivity with vinegar</th>
</tr>
</thead>
<tbody>
<tr>
<td>elasticity</td>
<td>Flammability</td>
<td>Density</td>
<td>Transparency</td>
<td>ductility</td>
</tr>
</tbody>
</table>

Each word is used once. Define the word when done!

**Chemical Property**

<table>
<thead>
<tr>
<th>Flammability</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to rust</td>
<td>The ability to burn</td>
</tr>
<tr>
<td>Reactivity with vinegar</td>
<td>Reacts with oxygen to produce rust</td>
</tr>
</tbody>
</table>

**Physical Property**

<table>
<thead>
<tr>
<th>Transparency</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>Measure of temperature at which liquid becomes gas</td>
</tr>
<tr>
<td>Elasticity</td>
<td>Measure of how stretchy substance is</td>
</tr>
<tr>
<td>Melting Point</td>
<td>Measure of temperature at which solid becomes liquid</td>
</tr>
<tr>
<td>Density</td>
<td>Measure of how much stuff is in a given space</td>
</tr>
<tr>
<td>Brittleness</td>
<td>Measure of how easily something breaks</td>
</tr>
<tr>
<td>Ductility</td>
<td>Measure of how easily something can be made into wire</td>
</tr>
</tbody>
</table>

**Part Two:** Physical or Chemical Change? Indicate with a 'P' or a 'C' which type of change is taking place.

1. P glass breaking
2. P hammering wood together
3. C a rusting bicycle
4. P melting butter
5. P separate sand from gravel
6. C bleaching your hair
7. C frying an egg
8. P squeeze oranges for juice
9. P melting ice
10. P mixing salt and water
11. P mixing oil and water
12. P water evaporating
13. P cutting grass
14. C burning leaves
15. C fireworks exploding
16. P cutting your hair
17. P crushing a can
18. P boiling water