Name: Date: Period:

Physical vs. Chemical Changes

Read and discuss the information on physical and chemical changes with your group. After everyone has read the information we will rotate through the stations and you will decide whether a physical or chemical change is displayed at that station.

**Physical Change**:

1) **Atoms do not rearrange** (switch partners).

2) Only physical properties change. Chemical properties do not change.

3) Physical changes are generally **easy to reverse**.

4) **No energy is produced** by the substance.

Example: An ice cube (H20) melts in the sun and turns into water (H20).

This is a physical change because we still have H2O just in a different state—now it is liquid rather than solid.

**Common examples of physical changes are: melting, freezing, condensing, breaking, crushing, cutting, and bending.**

**Chemical Change**:

1) **Atoms are rearranged** into different molecules. There will be a new chemical formula.

2) Both **physical and chemical properties** are **changed**.

3) Changes are **not reversible** without another reaction.

4) **Energy** is often **produced** (fire or heat, for example).

Here are two examples:

1. Two hydrogen atoms (H) and one oxygen atom (O) combine to make a water molecule (H2O).
2. One sodium atom (Na) and one chlorine atom (Cl) combine to make a molecule of table salt (NaCl).

In both examples above, the identity of the substance is altered not just its state.

**Common examples of chemical changes are: digestion, respiration, photosynthesis, burning, and decomposition.**

**Station 1**

1. Add a small amount of baking soda to a clear plastic cup.
2. Slowly add a small amount of vinegar to the cup and observe what happens
3. Record what happens in your data table.
4. Clean up your station; pour all wastes into the waste container.

**Station 2**

1. Use dropper to cover the bottom of a petri dish with milk
2. Place 1 drop of each food coloring in the middle of the milk. The drops should not touch each other, but they should be dropped in a circular pattern (see diagram).
3. Dip a cotton swab in dishwashing detergent liquid
4. Touch the coated swab to the milk in the center of the plate.
5. Don’t stir the milk; it is not necessary.
6. Record what happens in your data table.
7. Clean up your station; pour all wastes into the waste container.

**Station 3**

1. Take a piece of yellow paper and put it in front of you.
2. Dip a cotton swap in household ammonia.
3. Use the cotton swap to draw a ☺.
4. Record what happens in your data table.
5. You may keep your yellow paper, but throw away the cotton swab.

**Station 4**

1. Take a magnet and touch the side of the test tube containing sulfur powder (yellow) and iron filings and move it along the outside of the test tube.
2. Record what happens in your data table.
3. Leave the test tube and sulfur for other groups to use.

**Station 5**

1. Take a small amount of white powder (sodium polyacrylate) and place it into a small cup.
2. Use a dropper to slowly add water to the cup. Observe what begins to occur.
3. Continue to add water to the cup.
4. Use your finger to touch what is inside the cup. (Don’t worry --- it is non-toxic)
5. Record what happens in your data table.
6. Clean up your station; pour all wastes into the waste container.

**Station 6**

1. Take three small beakers and put them in numerical order.
2. Fill beaker #1 about ¼ full of ammonia.
3. Put 1 drop of phenolthalein to beaker #2.
4. Fill beaker #3 about ½ full of vinegar. Make sure that this beaker has twice as much as beaker #1.
5. Take beaker #1 and pour it into beaker #2. Observe what occurs.
6. Take beaker #2 and pour it into beaker #3.
7. Record your observations in your data table.
8. Clean up your station; pour all wastes into the waste container.

Name: Date: Period:

**Data Table Chemical vs. Physical Changes**

|  |  |  |  |
| --- | --- | --- | --- |
| **Station #** | **What did you do at this station?** | **Describe what happened after you performed the task at this station.** | **Was this a chemical or physical change? Explain.** |
| **1** |  |  |  |
| **2** |  |  |  |
| **3** |  |  |  |
| **4** |  |  |  |
| **5** |  |  |  |
| **6** |  |  |  |

Identify each of the following as a Physical or Chemical Change.

Put a **P** next to **Physical Changes** Put a **C** next to **Chemical Changes**

1. A piece of wood burns to form ash. \_\_\_\_\_\_\_\_\_

2. Water evaporates into steam. \_\_\_\_\_\_\_\_\_

3. A piece of cork is cut in half. \_\_\_\_\_\_\_\_\_

4. A bicycle chain rusts. \_\_\_\_\_\_\_\_\_

5. Food is digested in the stomach. \_\_\_\_\_\_\_\_\_

6. Water is absorbed by a paper towel. \_\_\_\_\_\_\_\_\_

7. Hydrochloric acid bubbles when it reacts with zinc. \_\_\_\_\_\_\_\_\_

8. A piece of an apple rots on the ground. \_\_\_\_\_\_\_\_\_

9. A tire is inflated with air. \_\_\_\_\_\_\_\_\_

10. A plant turns sunlight, CO2, and water into sugar and oxygen. \_\_\_\_\_\_\_\_\_

11. Sugar dissolves in water. \_\_\_\_\_\_\_\_\_

12. Eggs turn into an omelet. \_\_\_\_\_\_\_\_\_

13. Milk sours. \_\_\_\_\_\_\_\_\_

14. A popsicle melts. \_\_\_\_\_\_\_\_\_

15. Turning brownie mix into brownies. \_\_\_\_\_\_\_\_\_

Choose 2 of the above examples and explain why you chose chemical or physical. Please

choose one of each type of change. Back up your explanation.

Physical change explanation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Chemical change explanation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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