Science Explains Changes Around Us

A. Fill in the Blanks

Complete the sentences with the correct scientific term.

1. A change in which no new substance is formed is called a _____ change.
2. The process of iron combining with oxygen and water to form rust is a type of _____.
3. The process of obtaining pure solid crystals from a solution is called _____.
4. A chemical reaction that releases energy in the form of heat is called an _____ reaction.
5. The formation of a solid in a solution during a chemical reaction is called a _____.

B. Match the Following;

Match the example in Column A with the best description in Column B. Write the letter of your answer in the blank.

Column A	Column B
1. _____ Rusting of Iron	A. A physical change where a substance changes from a liquid to a solid.
2. _____ Dissolving sugar in water	B. A chemical change that produces food for plants using light energy.
3. _____ Burning a magnesium ribbon	C. A physical change where a solute disappears into a solvent but can be recovered.
4. _____ Freezing water	D. A chemical change that requires oxygen and water, forming a new substance.
5. _____ Photosynthesis	E. A chemical change that produces a brilliant white light and heat.

C. Practice Problems

Identify the following as a Physical Change or a Chemical Change. Provide a brief reason for your answer.

1. Rusting of an iron nail: Type of Change: _____ Reason:

2. Boiling water to make steam: Type of Change: _____ Reason:

3. Digesting your lunch: Type of Change: _____ Reason:

4. Chopping a carrot into small pieces: Type of Change: _____ Reason:

5. A firework exploding: Type of Change: _____ Reason:

6. Mixing sand and water: Type of Change: _____ Reason:

7. Milk turning sour: Type of Change: _____ Reason:

8. Stretching a rubber band: Type of Change: _____ Reason:

9. Frying an egg: Type of Change: _____ Reason:

10. Dissolving salt in water: Type of Change: _____ Reason:

D. Warm-up Questions

Answer these quick questions to get your brain warmed up!

1. What is the main difference between a physical change and a chemical change?

2. Is melting an ice cube a physical or chemical change?

3. Name one common sign that a chemical change has occurred.

4. Is baking a cake an example of a physical or chemical change?

5. If you tear a piece of paper, have you caused a physical or chemical change?

E. Challenge Questions

Think critically to answer these more difficult questions.

1. A candle is lit and burns for an hour. Describe one physical change and one chemical change that are happening.

2. If you burn a 10-gram log of wood, the remaining ash weighs only 1 gram. Does this mean 9 grams of matter were destroyed? Explain your answer.

3. Are all physical changes easily reversible? Give an example to support your answer.

4. What is galvanization, and how does it relate to preventing a chemical change?

5. When you mix baking soda and vinegar, you see fizzing and bubbling. What type of change is this, and what do the bubbles indicate?

F. Word Problems & Application

Apply your knowledge to these real-world scenarios.

1. The Breakfast Chef: A chef toasts a slice of bread, melts butter on it, and scrambles an egg. Identify one physical change and one chemical change from this process.
2. The Ancient Statue: Acid rain reacts with the limestone (calcium carbonate) of an old statue, causing its surface to crumble and change into a new substance. What type of change is this, and why is it a problem for historical monuments?
3. Instant Cold Pack: A first-aid instant cold pack gets very cold when you squeeze it, mixing the water and ammonium nitrate inside. Is this a physical or chemical change? What is the scientific term for a reaction that absorbs heat from its surroundings?
4. The Green Leaf: A plant uses sunlight, water, and carbon dioxide to create its own food (glucose) and release oxygen. Is photosynthesis a physical or chemical change? Justify your answer.
5. Making Jewelry: A jeweler melts a bar of gold and pours it into a mold to make a ring. Has the gold undergone a physical or chemical change? Explain.

G. True or False

1. Cutting a log of wood into small pieces is a chemical change. _____
2. When an iron gate rusts, its weight increases. _____
3. The formation of bubbles always indicates a chemical change. _____
4. Dissolving sugar in water is an irreversible chemical change. _____
5. Most chemical changes are easily reversible. _____