Grade 5 **Standard 1** **Unit Test 1**
Matter

Multiple Choice

1. A house made of toy blocks is weighed. It is taken apart and each block weighed separately. If the weight of all the blocks is added, what will it total?

A. A little less than the weight of the house.
B. The same as the house.
C. A little more than the weight of the house.
D. It would depend on how large the house was.

2. Water in a flask is weighed and then boiled. What will happen to the weight of the flask?

A. It will increase as the water boils.
B. It will decrease as the water boils away.
C. It will stay the same.
D. It is unpredictable.

3. 5 grams of orange drink mix are added to 100 grams of water. What would you expect the new solution to weight?

A. 95 grams
B. 100 grams
C. 105 grams
D. 500 grams

4. Which of the following is a common chemical change that is important to people?

A. Melting ice
B. Dissolving sugar
C. Sharpening pencils
D. Cooking food

5. What evidence shows that ice has a physical change when left out in a room?

A. It reacts with oxygen in the air.
B. It changes to water.
C. It is hard and white.
D. It is cold to the touch.

The following data were collected by testing four substances. Each was tested to see if it floated in water, burned when lighted with a flame, or melt when heated. Use this data to answer the next two questions.

Substance	Floated in water	Burned when lighted	Melted when heated
A	Yes	Yes	No
B	No	No	No
C	Yes	Yes	No
D	No	No	Yes

6. Which substance had a physical change?

A. A
B. B
C. C
D. D

7. Which tests a chemical property?

A. Floating in water
B. Burning when lighted
C. Melting when tested

8. Bread placed in a toaster turns brown then black if left too long. What kind of a change is this?

A. Physical change
B. Chemical change
C. No change
D. Can't be determined

9. A student watches an ice cube melt into a puddle of water. Has a chemical reaction taken place?

A. Yes, a gas has been given off.
B. Yes, the color has changed.
C. No, water does not react chemically.
D. No, no new substances have formed.

A student made observations as he watched a white candle burn. Use his data to answer the next two questions.

Time	Observations
0 minute	Candle is lit, black smoke rises, flame starts
1 minute	Flame glows red and orange
2 minutes	Wax drips down sides
3 minutes	Candle is shorter than when it started
4 minutes	Hot gases are rising

10. Which of the observations would show that a burning candle is a chemical reaction?

A. Black smoke is given off; hot gases are rising.
B. The wax starts to melt.
C. The candle is white and made of wax and a wick.
D. Time passes one minute at a time.

11. Which of the observations would show that a burning candle has physical changes?

A. Black smoke is given off; hot gases are rising.
B. The wax starts to melt.
C. The flame glows red and orange.
D. Time passes one minute at a time.

12. How might reactions with burning be important in your daily life?

A. Food is grown by burning.
B. Modern medicines depend on burning.
C. Most clean water is created by burning.
D. Burning fuel supplies heat for home.

Constructed Response

1. Fifty (50) grams of vinegar and 2 grams of baking soda are misted together. A bubbling reaction takes place. The mixture is weighed again and now weighs 49 grams. How do you explain the missing weight?

2. A student measures the weight of an ice cube and then lets it melt. What would you expect the weight of the water produced to be? Why?

3. What does a physical property tell you about a substance?

4. You are cooking in your kitchen and think you have made a chemical reaction by adding two substances together. How will you tell a chemical reaction has occurred?

Answers to Standard 1 Unit Test 1:

Multiple Choice

1. B
2. B
3. C
4. D
5. B
6. D
7. B
8. B
9. D
10. A
11. B
12. D

Constructed Response

1. The gas that escaped from the mixture contained the missing weight.

2. The weight would be the same as the ice cube. The particles of ice have changed form but none of them have gone anywhere.

3. What it looks like, how it acts.

4. When two or more substances come together to form something new. Heat, light, or gas is given Off.

Multiple Choice

1. Sarah and Jake were each given a ball of clay of the same weight. Both students used all their clay to make an object. Sarah rolled hers into a ball; Jake made a long, skinny rope. What do you expect the weight of the clay figures to be now?

   A. Sarah's weighs more because it is round.
   B. Jake's weighs more because it is long.
   C. There is no way of knowing.
   D. The figures would be equal.

2. Stuart measures 10 grams of water and pours it into a container and seals it with a lid. He then freezes it. A day later he takes the container out of the freezer and notices the ice is larger than before. When he takes the ice out of the container, what would he expect it to weigh?

   A. 10 grams
   B. 11 grams
   C. 20 grams
   D. Impossible to know

3. Which of the following is NOT a physical property matter?

   A. State (solid, liquid, gas)
   B. Hardness
   C. Shape
   D. Flammability

4. Five (5) grams of salt are dissolved in 100 ml of water to form a saltwater solution. If the solution is left to sit until the water has evaporated away, how much salt would you expect to be left in the container?

   A. 2.5 grams
   B. 5 grams
   C. 105 grams
   D. 500 grams

A student wished to cool off a can of soda pop quickly. She put it in the freezer but then forgot it. When she went back the next day, the can was ripped open and the soda was all over the freezer. Use this information to answer the next two questions.

5. The student decided that a physical change had occurred when the pop expanded. What evidence supports her conclusion?

   A. The can was stuck to the freezer.
   B. No new substances had formed.
   C. The pop had changed from brown to blue.
   D. Both the pop and can were very cold.

6. The student wondered if all substances would do the same thing as the soda. How could he/she design an experiment to find out?

   A. Pour the same amount of 4 different liquids into ice cube trays. Wait one day and measure sizes.
   B. Put 1 can of soda in the freezer and 1 can in the refrigerator. Wait two days.
   C. Put 4 cans of soda in the freezer and leave overnight.
   D. Place 1 open can of soda and 1 unopened can of soda in the freezer and wait one day.

7. Baking soda and vinegar are mixed in a bottle. A balloon placed over the top fills and expands with gas. How do you know a chemical reaction has taken place?

   A. A solid and a liquid have been mixed together.
   B. A new substance has formed.
   C. The balloon has stretched and changed shape.
   D. The bottle has not changed.

8. A pair of scissors left outdoors has rusted. What evidence shows that a chemical reaction has taken place?

   A. They are hard to use.
   B. The sun was warmed them.
   C. They are dirty.
   D. A new substance has formed.

9. How are fireworks examples of chemical reactions?

   A. They are made of chemicals.
   B. Heat and light are given off.
   C. It is easy to reverse the explosion.
   D. They are only used for special occasions.

10. Five (5) grams of baking soda and 20 grams of vinegar are added together. A bubbling reaction starts. When it is over, the solution weighs 24 grams. Why has the weight changed?

    A. A gas has formed and left the mixture.
    B. The vinegar has evaporated.
    C. The new solution was lighter.
    D. Baking soda is lighter when dissolved in vinegar.

Constructed Response

1. Describe the physical changes that happen to an ice cube as it melts.

2. Identify two chemical changes that you observe daily.

3. What is a chemical reaction? What is one way you know it has occurred?

4. Tell why burning a piece of wood is a chemical reaction.

Answers to Standard 1 Unit Test 2:

Multiple Choice

1. D
2. A
3. D
4. B
5. B
6. A
7. B
8. D
9. B
10. A

Constructed Response

1. The ice cube looks square and is a hard solid. It will melt into a clear liquid, water. The water will evaporate into a gas that is invisible.
2. Cooking food, burning fuel, digesting food, rusting, etc.
3. When two or more substances come together to form something new. It cannot be reversed or undone easily or energy is required or released.
4. The wood combines with air (oxygen in air) to form new substances such as ash and smoke. Energy is given off. The new substances cannot be put back together to form wood.

Grade 5 **Standard 1** **Performance Test 1**

Plop, Plop, Fizz, Fizz

Description: Students will perform a chemical reaction and weight the reactants and the products to show that weight doesn't change in a chemical reaction.

Materials Needed: 2-liter pop bottle (clear plastic), balance, water, Alka-Seltzer tablets (or any effervescent stomach aid) balloon. Baking soda and vinegar could also be used.

Prior to Assessment: Students should understand that a chemical reaction involves the formation of a new substance that may be a gas. They should also know that the weight of substances does not change in a chemical reaction. It would also be helpful for them to know, that within certain limits, their balances will not read the same object precisely the same each time it is weighed.

Time Needed: 50 minutes

Procedure

1. 100 ml of water should be added to the bottle.
2. The bottle (with water), the balloon, and the Alka-Seltzer tablet should we weighed together on the balance.
3. The Alka-Seltzer tablet should be placed in the balloon. If the tablet has to be broken, all the pieces should be placed in the balloon.
4. Attach the balloon around the top of the bottle so it covers it and seals tightly.
5. Raise the balloon and allow the Alka-Seltzer to drop down into the bottle.
6. After the reaction is over, weigh again.
7. Students should record their data and answer the following questions:
   a. Did the weight change? Why or Why not?
   Answer: No, the material did not escape and no new material was added.

   b. What new substances were formed?
   Answer: A gas and a solution of water and Alka-Seltzer.

8. The balloon should be taken off and the gas allowed to escape. The bottle should be weighed again. Students should answer these questions:
   c. Did the weight change? Why or why not?
   Answer: Yes, the gas escaped and it had weight.

Scoring Guide:

1. Student follows directions ……. 3 pts.
2. Student records data ……..... 3 pts.
3. Student correctly answers questions …….. 6 pts.

Grade 5 **Standard 1** **Performance Test 2**

Testing for Physical Properties

Activity Description: Students will test a substance and find its physical properties. They will share their information with the class.

Materials Needed: Substances (number and amount depend on whether students work in groups or individually) examples: water, wood, plastic, metals, salt, soap, wax, fabric, cornstarch, baking soda, glass, clay.
Test materials: magnets, batteries, wires, light bulbs, hand lens, water, spoons, heat source (candle, alcohol burner, hot plate) goggles, aluminum foil, tongs, aprons.

Prior to Assessment: Students should be familiar with the following: what a physical property is and what some of the properties are. Properties such as flexibility, color, density (relative weight for its size) should not be overlooked. Liquids can be tested for pourability, stickiness, or transparency. Students may need help understanding electrical conductivity. A typical test with a light bulb in a circuit should be demonstrated. Safety with your heat source should be discussed and how to test using the heat should be explained. If this test is too difficult in your situation, skip it.

Time Needed: Two to three 45-minute periods.

Procedure:

1. Students are assigned a substance and should (on paper) describe five physical properties they can test (or observe) with their substance.
2. Stations may be set up around the room where students can test their substances. The heating station may need special attention from the teacher. A small amount of the substance can be placed on a piece of aluminum foil and placed over the heat. Tongs should be available to handle it. Goggles and aprons should be worn around heat in case of spattering.
3. Students should write down all their findings. Emphasize that a substance that did not respond in the test, still reacted.
4. Students can prepare a short presentation to "introduce" their substance. They should describe it and its physical properties completely.

Scoring Guide:

1. Student describes five properties to test on their substance …….. 5 pts.
2. Student records data from each test performed ……. 5 pts.
3. Presentation is complete and substance is fully described as to its physical properties ……... 5 pts.

Grade 5 **Standard 1** **Performance Test 3**

Chemical Change Log

Activity Description: Students will keep a log of the chemical changes they see or use during a single day.

Materials Needed: Logbook

Prior to Assessment: Students should know the definition of a chemical change. They should have had experience identifying them.

Time Needed: 1 day, 40 minutes of class time

Procedure:

1. If students do not have a logbook, suggest where they should keep the log in a notebook or journal, etc.
2. Each observation should have a description of the event, and should describe the substance before and after the change.
3. Students should be given the following Scoring Guide to help them understand what is expected.

Scoring Guide:

1. Each observation is clearly described …….. 10 pts.
2. The substances are described before and after ……. 10 pts.
3. At least 10 observations are recorded …….. 10 pts.

Grade 5 **Standard 1** **Performance Test 4**

Chemical or Physical?

Activity Description: Students will watch a series of demonstrations and determine whether a chemical change has occurred. They will explain their reasoning.

Materials Needed: baking soda and vinegar, bromothymol blue or other acid/base indicator, acidic and basic solutions (acidic=vinegar, soda pop, lemon juice, basic=soaps, window cleaner), clear glass containers, flour, sand, match, paper, wax, heat source.

Prior to Assessment: Students should have had hands-on experience with physical and chemical reactions. They should have a good understanding of the difference between physical changes and chemical reactions.

Time needed: 45 minutes

Procedure:

1. Students need a paper folded in half the long way. The two resulting columns should be labeled: "Physical change/Chemical reaction" and "Why"?
2. As the teacher demonstrates the following changes, the students should record whether they think a physical change or a chemical reaction has occurred and why they think so. The reactions listed are examples; others may be used if materials are more accessible.

    a. Mix 2 tsps. baking soda with 50 ml of vinegar.
    b. Mix equal amounts of flour and sand in a clear glass container.
    c. Add an acid or based to Bromothymol Blue. (water that red cabbage has been boiled in also makes an excellent acid or base indicator).
    d. Burn a piece of paper (have a dish with water ready to catch the remains!)
    e. Melt some wax in a clear glass container.

Scoring guide:

Student receives 2 points for each correct answer and one correct reason given.

a. Chemical reaction - a new substance, the gas if formed; energy is given off, not easily reversible.
b. Physical change – no new substance is formed, easily reversible, no energy exchange
c. Chemical reaction – a new substance (the colored material) is formed.
d. Chemical reaction – two new substances, the gas and the black paper remains are formed; energy is given off, not easily reversible.
e. Physical change – no new substance is formed, easily reversible.