

Grade 9 Unit Practice Test

# Science

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Matter and  
Chemical Change

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1. Which of the following rows identifies an element that is common to both combustion and corrosion reactions and identifies whether this element is a reactant or product of the reaction?

Row	Element	Reactant or Product
A.	Oxygen	Reactant
B.	Oxygen	Product
C.	Water	Reactant
D.	Water	Product

Use the following information to answer question 2.

Element	Melting Point (°C)	Boiling Point (°C)	Colour	Conductivity	Malleability
I	962	2 162	Lustrous silver	Good conductor	Very malleable
II	-218	-183	Colourless	Good insulator	Not malleable
III	115	445	Yellow	?	Not malleable
IV	1 064	2 856	Lustrous yellow	?	Very malleable

2. Which of the following statements describes the conductivity of elements III and IV?
- A. Both elements are good insulators.
  - B. Both elements are good conductors.
  - C. Element III is a good conductor and Element IV is a good insulator.
  - D. Element III is a good insulator and Element IV is a good conductor.
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3. What is the chemical name of a molecular substance that is composed of one carbon atom and four chlorine atoms?
- A. Carbon tetrachlorine
  - B. Carbon tetrachloride
  - C. Carbon chlorine
  - D. Carbon chloride

4. Which of the following statements about helium, neon, and argon is true?
- A. They have the same number of protons.
  - B. They have the same number of neutrons.
  - C. They are solids at a temperature of 25 °C.
  - D. They react with other substances in a similar way.
5. Which of the following rows identifies both the elements and number of atoms that are present in one molecule of  $C_6H_{12}O_6$ ?

Row	Elements	Number of Atoms
A.	Carbon, helium, and oxygen	12
B.	Carbon, helium, and oxygen	24
C.	Carbon, hydrogen, and oxygen	12
D.	Carbon, hydrogen, and oxygen	24

6. Which of the following events is an example of a chemical change?
- A. Liquid nitrogen evaporates.
  - B. A candle burns.
  - C. Water boils.
  - D. Ice melts.
7. Which of the following rows matches the type of element with the type of compound that forms when two elements of that type are combined?

Row	Type of Element	Type of Compound
A.	Metallic	Ionic
B.	Metallic	Molecular
C.	Non-metallic	Ionic
D.	Non-metallic	Molecular

8. Which of the following substances is classified as a solution?
- A. Acid rain
  - B. Table salt
  - C. Helium gas
  - D. Baking soda

Use the following information to answer question 9.

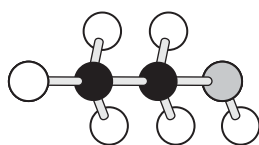
A student tests the reactivity of four metals by placing a piece of each metal into 200 g/L of hydrochloric acid. Each piece has an initial mass of 4.0 g. The student records her observations in the following table.




Metal	Temperature of Solution After Metal Reacts with Hydrochloric Acid (°C)	Mass of Metal After it Reacts with Hydrochloric Acid (g)
1	28	1.8
2	29	3.2
3	42	1.4
4	35	2.0

9. The information in the table shows that the metal that reacts **most readily** with hydrochloric acid is
- A. 1
  - B. 2
  - C. 3
  - D. 4

Use the following information to answer question 10.

**A Model of a Molecule**



Legend	
	Hydrogen
	Carbon
	Oxygen

10. The chemical formula for the unknown molecule shown above is
- A.  $P_2H_5OH$
  - B.  $P_2H_5CH$
  - C.  $C_2H_5OH$
  - D.  $O_2H_5CH$

Use the following information to answer numerical-response question 1.

A student who burns a piece of magnesium that has a mass of 70.2 mg makes the following observations.

- Heat is generated.
- An intense white light is emitted.
- A mass of 130.8 mg of white magnesium oxide ash is produced.

### Numerical Response

1. The mass of oxygen that reacts in the chemical reaction described above is \_\_\_\_\_ mg.

(Record your answer.)

\_\_\_\_\_

Use the following information to answer question 11.

During a laboratory experiment, four students each combined two substances and recorded their observations.

Student	Substance I	Substance II	Observation of Substances I and II Combined
1	White solid	Clear liquid	Clear liquid that remains at room temperature
2	Clear liquid	Blue solid	Blue liquid
3	White solid	Clear liquid	Clear liquid that bubbles
4	Yellow liquid	White solid	White solid that floats on top of the yellow liquid

11. Which student **most likely** produced a new chemical substance?

- A. Student 1
- B. Student 2
- C. Student 3
- D. Student 4

12. Which of the following rows identifies both the elements and the total number of atoms that are present in one molecule of  $\text{CH}_3\text{COOH}(\text{aq})$ ?

Row	Elements	Total Number of Atoms
A.	Carbon, helium, and oxygen	3
B.	Carbon, helium, and oxygen	8
C.	Carbon, hydrogen, and oxygen	3
D.	Carbon, hydrogen, and oxygen	8

13. The number of electrons in one beryllium atom is

- A. 9
- B. 5
- C. 4
- D. 2

14. Which of the following pairs of elements have the **most** properties in common?

- A. Fluorine and oxygen
- B. Fluorine and chlorine
- C. Sodium and neon
- D. Sodium and magnesium

15. Which of the following rows classifies the type of compound formed when sodium and chlorine react together and states whether this compound conducts electricity when dissolved in water?

Row	Type of Compound	Conducts Electricity When Dissolved in Water
A.	Molecular	Yes
B.	Molecular	No
C.	Ionic	Yes
D.	Ionic	No

16. Which of the following statements describes a physical property of a substance?
- A. Hydrochloric acid produces heat when mixed with zinc.
  - B. Phosphorous burns when exposed to air.
  - C. Lithium reacts violently with water.
  - D. Copper conducts electricity.

*Use the following information to answer question 17.*

Rutherford used the solar system as a model to explain the structure of an atom.

17. When this model is compared to an atom, the planets represent the
- A. protons
  - B. nucleus
  - C. neutrons
  - D. electrons

*Use the following information to answer question 18.*

A group of students conducts an experiment to determine the effect of temperature on reaction rates. They perform three separate trials in this experiment. In the first trial, they drop an antacid tablet into a beaker of water at a temperature of 40 °C and record how long it takes the tablet to completely dissolve. In the second and third trials, they use the same type and amount of antacid, but they change the temperature of the water to 25 °C for the second trial and 5 °C for the third trial.

18. The manipulated variable in this experiment is the
- A. type of antacid used
  - B. amount of antacid used
  - C. time it takes for the reaction to occur
  - D. temperature at which the reaction occurs



## Numerical Response

2. For each of the elements given below, indicate whether it is a metal or non-metal using the following code.

1 = Metal

2 = Non-metal

\_\_\_\_\_  
**Aluminum**

\_\_\_\_\_  
**Fluorine**

\_\_\_\_\_  
**Lithium**

\_\_\_\_\_  
**Phosphorus**

(Record all **four digits** of your answer.)

## Science 9 – Practice Test 2019 Matter and Chemical Change Key

Question # in Document	Key
1	A
2	D
3	B
4	D
5	D
6	B
7	D
8	A
9	C
10	C
NR1	60.6
11	C
12	D
13	C
14	B
15	C
16	D
17	D
18	D
NR2	1212