**Unit 5, Lesson 5 & 6 Quiz**

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

**\_\_\_\_ 1.** Mr. Simmons is a scientist who wants to dissolve copper metal in a solution of acid. He has three different forms of copper: copper powder, copper beads, and copper wire, as shown in the pictures.



Which of the following lists the forms of copper in order of how quickly they would dissolve in the acid solution from **fastest** to **slowest**?

|  |  |
| --- | --- |
| **A** | beads, powder, wire |
| **B** | beads, wire, powder |
| **C** | powder, beads, wire |
| **D** | powder, wire, beads |

**\_\_\_\_** **2.** Lily is studying how quickly sugar dissolves in warm and cold water. First, she dissolves a 4 g sample of raw sugar, as shown in the following figure, in both warm and cold water. Then, she dissolves a 4 g sample of white sugar, as shown in the following figure, in both warm and cold water.



In which of the following solutions would the sugar dissolve the **slowest**?

|  |  |
| --- | --- |
| **A** | raw sugar, cold water |
| **B** | raw sugar, warm water |
| **C** | white sugar, cold water |
| **D** | white sugar, warm water |

**\_\_\_\_** **3.** Levi has a sample of raw sugar made up of large particles and a sample of white sugar made up of much smaller particles.



Levi added 1 tsp of raw sugar and 1 tsp of white sugar to two identical cups of hot water. What did Levi **most likely** observe?

|  |  |
| --- | --- |
| **A** | The white sugar and the raw sugar dissolved at the same rate. |
| **B** | The white sugar dissolved slowly, and the raw sugar dissolved quickly. |
| **C** | The white sugar dissolved quickly, and the raw sugar dissolved slowly. |
| **D** | The white sugar dissolved quickly, and the raw sugar did not dissolve at all. |

**\_\_\_\_** **4.** Caydence is studying how the rate of stirring affects the time it takes for salt to dissolve. He added 1 g of salt to each of four beakers filled with water, stirred the water at different speeds, and recorded how long it took for all the salt to dissolve each time. Caydence results are shown in the following table.

|  |  |
| --- | --- |
| **Stirring** | **Time (sec)** |
| No stirring | 25 |
| Slow stirring | 18 |
| Medium stirring | 10 |
| Fast stirring | 6 |

Which conclusion could Caydence draw based on his results?

|  |  |
| --- | --- |
| **A** | Salt will not dissolve in water unless the water is stirred. |
| **B** | Stirring a solution of water increases the rate at which a salt dissolves. |
| **C** | Stirring a solution of water decreases the rate at which a salt dissolves. |
| **D** | Stirring a solution of water has no effect on the rate at which a salt dissolves. |

**\_\_\_\_** **5.** Carson is studying factors that change how fast a material dissolves in water. Carson adds 1 g of sugar to 1 cup of water. She records how long the sugar takes to dissolve. Carson repeats the experiment using four samples. The conditions for each sample are shown in the table below.

|  |  |  |
| --- | --- | --- |
| **Sample** | **Temperature of water (°C)** | **Stirring speed** |
| 1 | 25 | slow |
| 2 | 25 | medium |
| 3 | 50 | slow |
| 4 | 50 | medium |

Which sample would have the **fastest** dissolving speed?

|  |  |
| --- | --- |
| **A** | sample 1 |
| **B** | sample 2 |
| **C** | sample 3 |
| **D** | sample 4 |

**\_\_\_\_ 6.** An atom is made up of particles called protons, electrons, and neutrons. Each type of particle differs in its charge and its location in the atom. Which of the following pictures shows the correct charge and location of each type of particle?

|  |  |
| --- | --- |
| **A** |  |
| **B** |  |
| **C** |  |
| **D** |  |

**\_\_\_\_** **7.** Dalvin is drawing atoms. He uses a circle with a + sign to show a proton. He uses a circle with no label to show a neutron. He uses a smaller circle with a – sign to show an electron. Which of the following drawings of atoms shows a different element from the other three?

|  |  |
| --- | --- |
| **A** |  |
| **B** |  |
| **C** |  |
| **D** |  |

**\_\_\_\_** **8.** Laney made the following model of a group of atoms that are bonded together in a single particle.



What is **true** of the particle?

|  |  |
| --- | --- |
| **A** | It is made up of only two atoms. |
| **B** | It is made up of only nine atoms. |
| **C** | It is made up of only two different elements. |
| **D** | It is made up of only nine different elements. |

**\_\_\_\_ 9.** A typical atom has no charge even though it is made up of particles that have a charge. The equal numbers of opposite charges cancel each other out. An ion, on the other hand, is an atom that has a charge. Some ions have a positive charge. Some ions have a negative charge. Which describes an ion with a negative charge?

|  |  |
| --- | --- |
| **A** | It has more electrons than protons. |
| **B** | It has more neutrons than protons. |
| **C** | It has more protons than electrons. |
| **D** | It has more protons than neutrons. |

**\_\_\_\_ 10.** A particle of matter can have a positive charge, which is shown by a plus (+) sign. It can also have a negative charge, which is shown by a minus (–) sign. Some particles have no charge, which means they are neutral. Neutral particles are often shown with a zero (0). Which particle in an atom can be shown by a minus sign?

|  |  |
| --- | --- |
| **A** | electron |
| **B** | neutron |
| **C** | nucleus |
| **D** | proton |

**\_\_\_\_** **11.** Tanner knows that a certain substance is made of two different types of atoms. These atoms differ in the number of protons that they have. What kind of substance must it be?

|  |  |
| --- | --- |
| **A** | compound |
| **B** | element |
| **C** | metal |
| **D** | oxygen |

**\_\_\_\_ 12.** Water and carbon dioxide are compounds. Oxygen and carbon are elements. What is **true** of compounds?

|  |  |
| --- | --- |
| **A** | They are made up of only one type of atom. |
| **B** | Their atoms contain protons but not electrons. |
| **C** | Their atoms contain protons but not neutrons. |
| **D** | They are made up of more than one type of atom. |

**\_\_\_\_** **13.** Kate wants to make a model of a compound using colored marbles. She has three different colors of marbles, each representing a different element. Which describes a model of a compound Kate could make using these marbles?

|  |  |
| --- | --- |
| **A** | a single black marble |
| **B** | three red marbles connected together |
| **C** | two white marbles connected together |
| **D** | two white marbles connected to one red ball |

**\_\_\_\_** **14.** Elena’s science class is studying what makes up matter. Elena drew a diagram of the smallest particle that matter can be broken down into.



What did Elena’s diagram show?

|  |  |
| --- | --- |
| **A** | atom |
| **B** | compound |
| **C** | mixture |
| **D** | molecule |

**\_\_\_\_** **15.** Sophie knows that every element is made up of atoms. Sophie observes samples of several elements on her desk. Which of the following statements is **true**?

|  |  |
| --- | --- |
| **A** | She would be able to see the atoms of all elements. |
| **B** | She would be able to see the atoms of solid elements. |
| **C** | She would be able to see the atoms for large elements. |
| **D** | She would not be able to see the atoms of any elements. |

**Short Answer**

**1.** The following diagram shows three different forms of the metal called copper.



Which form of copper would dissolve the **fastest** in a solution of acid and why?

**2.** Alexa dissolved 1 tbsp of salt in 1 cup of cold water. She then dissolved 1 tbsp of salt in 1 cup of hot water. How would the temperature of the water affect the dissolving rate?

**Unit 5, Lesson 5 & 6 Quiz**

**Answer Section**

**MULTIPLE CHOICE**

**1.** D

**2.** A

**3.** C

**4.** B

**5.** D

**6.** B

**7.** A

**8.** B

**9.** A

**10.** A

**11.** A

**12.** D

**13.** D

**14.** A

**15.** D

**SHORT ANSWER**

**1.** Sample answer:

The copper powder would dissolve the fastest in a solution of acid because the particles are much smaller. The smaller the particles, the faster a substance dissolves.

Students’ answers should include:

• The copper powder has the smallest particle size/is the finest/has the finest particles.

• Smaller particles dissolve faster.

**2.** Sample answer:

The salt would dissolve at a slower rate in the cold water and at a faster rate in the hot water.

Students’ answers may vary, but should include:

• The higher the temperature of the water, the faster the salt dissolves.

• The lower the temperature of the water, the slower the salt dissolves.

• The salt would dissolve faster in the hot water than in the cold water.

• As temperature increases, the dissolving rate increases.

• The higher the temperature of the water, the faster the dissolving rate.