Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Semester 1 Final Review Sheet

Unit 1

1. If a scientist performs a controlled experiment several times, and discovers that the data does not support their original prediction, is it okay to revise the original prediction based on the data and retested? Explain.
2. What must be true of any explanation a scientist develops?
3. Scientists conduct many types of scientific investigations. No matter the type, they include multiple trials. This is done to increase the what of the data collected?

Construct a Hypothesis

Ask a Question

Analyze your data and draw a conclusion

Test your hypothesis by doing an experiment

Which step above represents where a scientist takes accurate measurements?

1. Dan measured the air temperature at his house every three hours for 9 hours. He organized his finding using a bar graph. What is the difference between the coldest and the warmest temperatures during this time?
2. 15°
3. 20°
4. 25°
5. 45°
6. Renee rolls a steel ball down a ramp. She conducts multiple trials by releasing the ball from varying heights on the ramp. For each trial, she measures and records the release height of the ball and the distance the ball travels away from the ramp before falling to the ground. Draw a diagram to show this experiment. Be sure to label everything. What are the independent and dependent variables?
7. Sue conducts an experiment comparing foam drink cups to metal drink cups. She predicts that the foam cups insulate cold drinks better. She fills cups made from each of these materials with equal amounts of cold water. She then records the temperature of the water in each cup every 10 minutes until the water reaches room temperature. What condition in the experiment must be the same for this experiment to be valid?

Unit 2

1. A sodium atom has 2 electrons in its inner energy level, 8 electrons in its next energy level, and 1 electron in its outermost energy level. How many electrons are able to participate in chemical reactions?
2. Reactant A and reactant B undergo a chemical reaction to form product C. What type of substance is reactant B?

+

A B C

1. Amanda adds 10 g of baking soda to 100 g of vinegar. The mixture begins to bubble. When the bubbling stops, Amanda finds the mass of the resulting mixture to be 105 g. Why has the mass changed?
2. What do the elements in the table have in common?

|  |  |  |
| --- | --- | --- |
|  | Element 1 | Element 2 |
| Atomic number | 10 | 9 |
| Mass number | 20 | 19 |

1. Elements in the same group have chemical properties similar to each other. What else do these elements have in common?
2. How are elements in the periodic table arranged?
3. How are elements in the periodic table organized?
4. If a scientist were asked to identify a chemical compound that was found at a scene of a crime, what properties would be most helpful in identifying the unknown compound?
5. A magnet was placed near a pile that contained both iron and sulfur. The magnet was moved gradually closer to the pile. As it neared the pile, the magnet started attracting small pieces of iron from the pile. Is the pile a solution, suspension, compound or heterogeneous mixture?
6. The fuel butane (C4H10) reacts with oxygen (O2) to form water (H20) and carbon dioxide (CO2). Describe the number of carbon atoms before and after the reaction.
7. A substance contains an arrangement of different types of atoms joined together by chemical bonds. What type(s) of classes of substances could this describe?
8. Name some processes that are examples of physical change.
9. A ferrofluid is a liquid that hardens like a solid in the presence of a magnetic field. Based on this information, what are some properties that could make ferrofluids useful in engineering applications?
10. At room temperature, oxygen and hydrogen are both gases. Does this mean that all combinations of oxygen and hydrogen will also be gases at room temperature? Explain.
11. Which type of change does the diagram show?

Unit 5

1. Coal is a nonrenewable natural resource. Why is coal considered nonrenewable?
2. When coal is burned, sulfur is released into the air, where it reacts with oxygen to produce sulfur dioxide and sulfur trioxide. How do the chemical properties between the products and reactants compare?
3. Smog is a pollutant that can cause serious health problems. Smog is most often seen over large cities. What is the main ingredient of smog?
4. What are a couple ways that you could work toward improving your area’s water quality?

Unit 6

1. Stacey’s teacher shows the class photographs of four different animals. She asks the class to write down the physical characteristics of each animal. Using this information, how could the students determine which animals are more closely related than the rest?
2. The table below shows characteristics of three breeds of sheep.

|  |  |  |  |
| --- | --- | --- | --- |
| **Characteristic** | **Hampshire Sheep** | **Dorset Sheep** | **Columbia Sheep** |
| Quality of lamb | Poor | Good | Good |
| Tolerance to heat | Good | Poor | Poor |

Which two breeds should a selective breeding program pair together to result in sheep that are tolerant of heat and have good-quality lamb?

1. What did Charles Darwin observe about the finches on the Galapagos Islands?
2. Changes within an area’s climate may cause environmental changes, such as when a lush, grassy area becomes arid and desert-like. What will best help a species survive such changes?
3. When Charles Darwin observed finches on the Galapagos Islands, he noted differences in the shapes of the birds’ beaks. He observed that finches that ate insects had longer, narrower beaks than finches that crushed and ate seeds. Crushing seeds requires a larger, powerful beak. Based on this information, draw the beak of a finch that would most likely have an advantage for survival in an environment where seeds are the main source of food.
4. The diagram below illustrates changes over time in a population of wolves in the wild.

Mutation creates variation

Unfavorable mutations selected

against

Reproduction & mutation

occur

Favorable mutation more

Likely to survive

…and reproduce

What process is illustrated in the diagram?