Inquiry Unit Test Form A

1a. Design and conduct an investigation that includes predicting outcomes, using experimental controls, and making inferences. (DOK 3)

1. In an experiment to determine the intensity of indoor light for best plant growth, a student tests three of the same kind of plant, exposing them to indoor light from either one lightbulb, two lightbulbs, or three lightbulbs. What should be the controlled factors in the experiment?

   a. type of plant and amount of light it receives
   b. number of lightbulbs used in each trial
   c. type of dirt and amount of water the plant receives
   d. number of leaves and height of each plant

2. A student conducts an investigation and comes to the conclusion that the boiling point of water, which is 100°C, can change if salt is added to it. What data must the student have collected to support this conclusion?

   a. The temperature of salt water when it boils.
   b. The temperature of the flame used to boil the salt water.
   c. The amount of salt water left after the boiling stops.
   d. The amount of steam produced by boiling salt water.

Read the passage below and answer question 3.

A student adds sugar to a cup of iced tea and a cup of hot tea. She notices that the amount of sugar that dissolves in each cup is different. More sugar dissolves in the hot tea than in the iced tea. She thinks this has something to do with the temperature of the tea. She wants to design an experiment to see if she is correct.

3. Which of these hypotheses would be a good hypothesis for this experiment? (DOK 3, Proficient)
   a. If the amount of sugar dissolved increases, then the temperature of the tea increases.
   b. If the temperature of tea increases, then more sugar will dissolve in the water.
   c. How does the temperature of the tea affect how much sugar will dissolve?
   d. The temperature of the tea affects how much sugar dissolves.

4. Kate was conducting an investigation. She placed four buttons of the same size on a large piece of ice. She used a red button, a black button, a green button, and a white button. She placed the ice in direct sunlight for ten minutes, then checked to see which button had sunk deepest into the ice. In order for this to be a controlled investigation, what else should Kate do?
   a. She should place four buttons of other colors on another piece of ice.
   b. She should repeat the same setup, but put the ice in a dark place for ten minutes.
   c. She should use only two different colored buttons.
   d. She should place the ice in direct sunlight for a longer period of time.

5. Marie sees that the tomato plants on the left side of her garden grow tall but the tomato plants on the right side of her garden are shorter. She notices that the sun shines onto the left side of her garden, but not on the right side of her garden. Marie predicts that if she puts the tomato plants in the shade, then they will grow. She does an experiment where she puts plants in the shade and they do not grow. Should she confirm or reject her hypothesis? (DOK 2, Proficient)
   a. Marie should change her answers to match the hypothesis.
   b. Marie should confirm her hypothesis because the plants did not grow in the shade.
   c. Marie should reject her hypothesis because the plants did not grow in the shade.
   d. Marie should do the experiment over until her hypothesis and her results agree.

6. Jake learned in class that hand sanitizers kill germs. He wants to know whether some hand sanitizers are better at killing germs. He puts hand sanitizers on one group and doesn't put hand sanitizers on another group of germs and measures how many germs are left. What is his independent variable? (DOK 2, Proficient)
   a. hand sanitizer
   b. germs
   c. amount the germs grow
   d. alcohol

7. A student does and experiment to measure how long it takes milk to go bad at different temperatures. He left a container of Daily fresh milk at **0° C, 20 ° C,** and **25° C**. All the milk containers had the same expiration date. What is the dependent variable in the student's experiment? (DOK 2, Proficient)
   a. temperature
   b. milk
   c. expiration date
   d. how long it takes for the milk to go bad

8. Mark usually waters the grass with cold water. One day he accidentally waters the grass with hot water. He notices that this kills some of the grass. He thinks this has something to do with the temperature of the water. He predicts that if he waters the grass with warm water, then it will kill the grass. Mark does the experiment and finds out that all the 7 plants he watered with hot water died, while all the 7 plants he watered with cold water lived. Should he confirm or reject his hypothesis? (DOK 2, Proficient)
   a. He should confirm his hypothesis because half of the plants died.
   b. He should confirm his hypothesis because all the plants watered with hot water died.
   c. He should reject his hypothesis because plants from both groups died.
   d. He should reject his hypothesis because all the plants watered with cold water died.

1b. Distinguish between qualitative and quantitative observations and make inferences based on observations. (DOK 3)

9. What is the main difference between qualitative and quantitative data? (DOK 2, Basic)
   a. qualitative data is descriptive and quantitative data contains numbers
   b. qualitative data contains numbers and quantitative data is descriptive
   c. qualitative data cannot be used in experiments
   d. qualitative data is less scientific than quantitative data

10. Which of the following would be qualitative data? (DOK 2, Basic)
    a. the length of a penny
    b. the weight of a penny
    c. the color of a penny
    d. the area of the penny

11. Which of the observations is quantitative? (DOK 2, Basic)
    a. Has a body temperature of 90.5°
    b. Has many offspring each year
    c. Hunts in large packs
    d. Has tan fur

12. A scientist discovers a new animal in the wild. He observes that the animal has eight sharp teeth that show as the animal snarls. It has small ears and very thick, white fur. The animal can run quickly to catch its prey. The scientist concludes that these are adaptations the animal has developed to survive more easily.
    Which of the scientist's observations is quantitative? (DOK 3, Proficient)
    a. Small ears
    b. Thick fur
    c. Eight teeth
    d. Run quickly

Use the information below to answer questions 13 and 14.
As part of an investigation, students in a science class placed the same type and amount of bacteria in each of five test tubes. Different chemicals were added to four of the test tubes. After two days, the test tubes were checked for the presence (cloudy) or absence (clear) of bacteria. The table below shows the results of the investigation.

Test Tube Number	Appearance of Liquid at Start	Bacteria Present	Chemical Added	Appearance of Liquid after Two Days	Bacteria Present
1	Cloudy	Yes	Alcohol	Clear	No
2	Cloudy	Yes	Bleach	Clear	No
3	Cloudy	Yes	Soap solution	Clear	No
4	Cloudy	Yes	Mouthwash	Clear	No
5	Cloudy	Yes	None	Cloudy	Yes

13. A group of students are discussing what types of observations was made during this experiment. Jason says the appearance at the start and after two days are both quantitative observations. Maria says the appearance at the start and after two days are both qualitative observations. Kayla says the appearance of the liquid at the start is quantitative and the appearance after two days is qualitative. Which student is correct? (Proficient, DOK 3)
    a. Jason is correct because both types of observations include numbers.
    b. Maria is correct because both types of observations are descriptions.
    c. Jason is correct because both types of observation are descriptions.
    d. Maria is correct because both types of observations include numbers.

14. Based on this data, what would be a logical inference? (Proficient, DOK 3)
    a. Bleach better at killing the bacteria than the soap solution.
    b. The liquid is clear at the end of the experiment because the bacteria has been killed.
    c. All of the test tubes had bacteria at the beginning of the experiment.
    d. Test tube 5 had no chemicals added to it during the experiment.

15. Students in Ms. Kincaid's class tested to see if the size of the coin affected how many drops of water the coin could hold. One group made the following observations about the coins: The penny is the only coin that isn't silver, the quarter held 56 drops, four coins were tested, and the dime only held 15 drops of water.

    Which of these observations is an example of qualitative data? (DOK 3, Proficient)
    a. The penny is the only coin that isn't silver
    b. The quarter held 56 drops
    c. Four coins were tested
    d. The dime only held 15 drops of water

16. Johnny is working on his homework in his living room and notices that the time is now 5:15. From the couch he can hear water running in the kitchen sink followed by the clanging of pots and pans. What is a logical explanation for these observations? (Proficient, DOK 2)
    a. Someone is washing dishes.
    b. Someone is rearranging the kitchen cabinets.
    c. Someone is cleaning the refrigerator.
    d. Someone is cooking supper.

1c. Use simple tools and resources to gather and compare information (using standard, metric, and non-standard units of measurement). (DOK 1)

17. Scientists around the globe use the metric system in their experiments. Why do all the scientists use the same system for measurement? (Basic, DOK 1)
    a. They all use the same system because it is against the rules to use another system.
    b. They all use the same system because it is more fun than the other systems.
    c. They all use the same system because it is the only system of measurement.
    d. They all use the same system because it is the easiest method to convert.

18. What is the measure of the line drawn below to the nearest centimeter? (Proficient, DOK 1)

    a. 15 cm   c. 17cm
    b. 16cm   d. 18 cm

19. What instrument is used to measure liquid volume? (Basic, DOK 1)
    a. Triple beam balance   c. Erlenmeyer flask
    b. Beaker   d. Graduated cylinder

20. What instrument is used to measure length? (Basic, DOK 1)
    a. Graduated cylinder   c. Metric ruler
    b. Triple beam balance   d. Thermometer

21. Ms. Kincaid's class is doing an experiment with how the amount of light affects plants. Students put three plants in the sunlight, three plants in the shade, and three plants in the dark. They make sure the plants get the same amount of water throughout the experiment. After two weeks they measure plants to see how tall they grew.

What pieces of lab equipment are being used in this lab experiment? (Proficient, DOK 1)

a. The balance and the graduated cylinder
b. The graduated cylinder and the beaker

c. The ruler and the graduated cylinder
d. The balance and the ruler

22. Ms. Kincaid's class is studying weather. Students are expected to measure temperature and amount of precipitation. What pieces of lab equipment are going to be used in this unit? (Proficient, DOK 1)

a. The thermometer and the balance
b. The balance and the graduated cylinder

c. The graduated cylinder and the ruler
d. The thermometer and the ruler

23. Four tools and a small rock sample are shown below. Density is found by dividing the mass by the volume. Which two tools could be used to determine the density of the rock sample? (Basic, DOK 1)

Balance   Meterstick

Graduated cylinder   Thermometer   Small rock sample
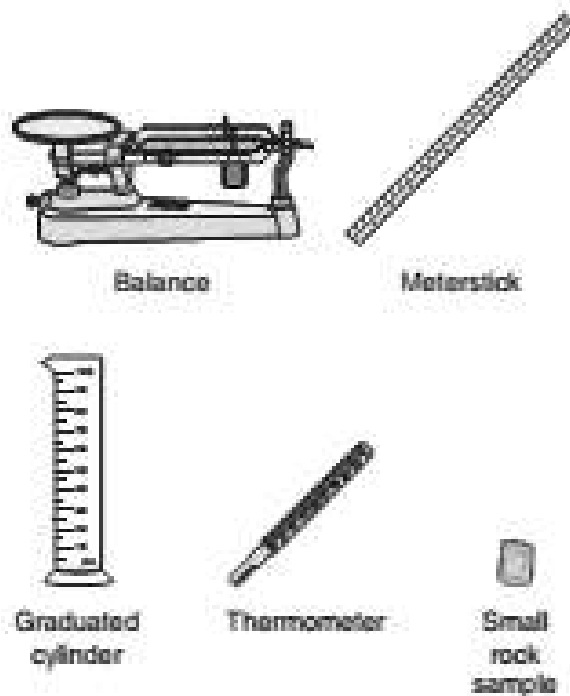
a. balance and graduated cylinder
b. balance and thermometer

c. graduated cylinder and thermometer
d. meter stick and thermometer

24. A student pours equal amounts of oil and water into a graduated cylinder and observed the two layers separated because of the different densities. The oil floated on top of the water because the oil had a lower density. How much oil and water were added to the graduated cylinder? (Proficient, DOK 3)
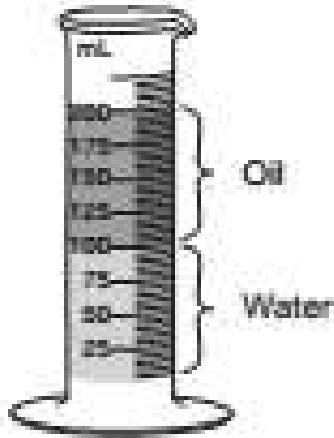
a. 75 ml of each
b. 80 ml of each
c. 100 ml of each
d. 125 ml of each

25. Samuel and Lane are conducting an experiment to determine if the mass of a car affects how far the car will travel. What two tools should be used for this experiment?
    a. Thermometer and ruler
    b. Meter stick and ruler
    c. Meter stick and balance
    d. Balance and graduated cylinder