

Name \_\_\_\_\_

Physical Science Summer Packet: Pre Test

1. Which is an example of a chemical property?

- a. mass
- b. density
- c. ability to rust
- d. color

2. Which is an example of a physical change?

- a. Water freezing
- b. silver tarnishing
- c. wood burning
- d. food being digested

3. The \_\_\_\_\_ of an object is the amount of space it takes up

- a. mass
- b. weight
- c. volume
- d. shape

4. Which is a way to find out an objects density?

- a. Measure its height
- b. use a scale
- c. Use a balance
- d. use water displacement and its mass.

5. An atom is the smallest part of a \_\_\_\_\_ that still has the same properties

- a. element
- b. compound
- c. molecule
- d. mixture.

6. The simplest form of matter are \_\_\_\_\_

- a. molecules
- b. elements
- c. Compounds
- d. electrons.

7. Which is **not** a way in which compounds form?

- a. chemical bonding
- b. transfer of electrons
- c. sharing of electrons
- d. splitting of electrons.

8. Which is not made of plasma?

- a. neon
- b. lightning
- c. air
- d. stars.

9. A solid becomes a liquid at its \_\_\_\_\_?

- a. boiling point
- b. melting point
- c. freezing point
- d. dew point

10. Changes in shape, size and state are :

- a. Chemical changes
- b. Physical changes
- c. molecular changes
- d. permanent changes.

11. When one substance dissolves in another substance, \_\_\_\_\_.

- a. the chemical composition remains the same.
- b. a chemical change occurs.
- c. they cannot be separated.
- d. one substance evaporates.

12. Which is **not true** of a chemical change?

- a. reactants becomes products.
- b. Molecules break down.
- c. Mass does not change.
- d. Properties do not change.

13. A \_\_\_\_\_ is a substance that separates from a liquid during a chemical change.

- a. solution
- b. solute
- c. precipitate
- d. concentration.

14. The atoms of an elements all have the same number of \_\_\_\_\_.

- a. Nucleons
- b. Protons
- c. Neutrons
- d. Molecules.

15. Most elements that have fewer than 95 protons are.

- a. synthetic
- b. unstable
- c. naturally occurring
- d. rare.

16. In a covalent bond, each atom \_\_\_\_\_.

- a. loses an electron
- b. shares an electron
- c. transfers and electron
- d. repels an electron.

17. A \_\_\_\_\_ describes what and how many elements are in a compound.

- a. chemical formula.
- b. chemical bond.
- c. chemical reaction.
- D. chemical reaction.

18. Two or more substances are blended evenly throughout a \_\_\_\_\_.

- a. homogeneous mixtures
- b. solute
- c. heterogeneous mixture
- d. solvent.

19. An acid is a substance that \_\_\_\_\_.

- a. Tastes sweet and feels slick.
- b. Produces hydrogen ions in a water solution.
- c. does not react with metals.
- d. does not react with carbohydrates.

20. Which is **not true** for bases?

- a. tastes bitter.
- b. Do not react with acids.
- c. produces hydroxide ions in water.
- d. feel slick.

21. A neutralization reaction occurs between \_\_\_\_\_.

- a. an acid and a base.
- b. two acids.
- c. two bases
- d. an acid and water.

22. The pH of a solution is its concentration of \_\_\_\_\_.

- a. carbon
- b. hydronium ions
- c. salt
- d. water molecules.

23. Solutions with a pH of less than 7 are \_\_\_\_\_?

- a. alkaline
- b. neutral
- c. Basic
- d. acidic.

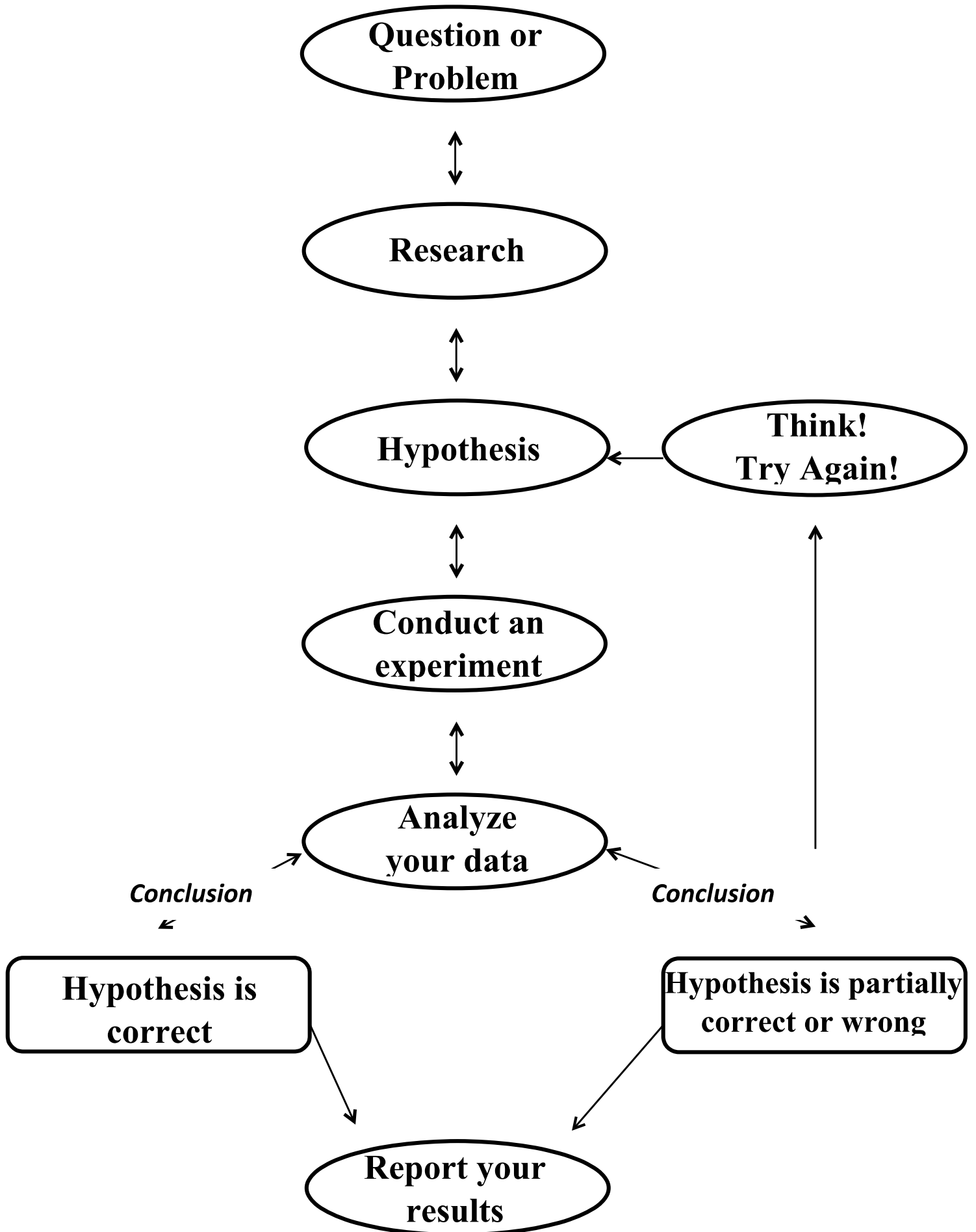
24. Which are not listed in the period table?

- a. atomic radius
- b. atomic numbers
- c. atomic masses
- d. symbols.

25. Most \_\_\_\_\_ are nonmetals.

- a. gases
- b. liquids
- c. plasma
- d. solids.

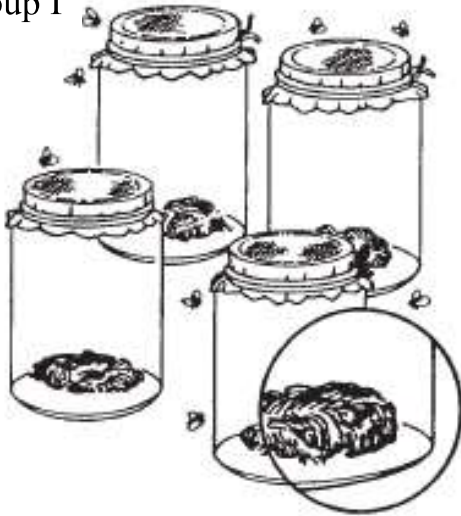
# The Scientific Method Summer Packet



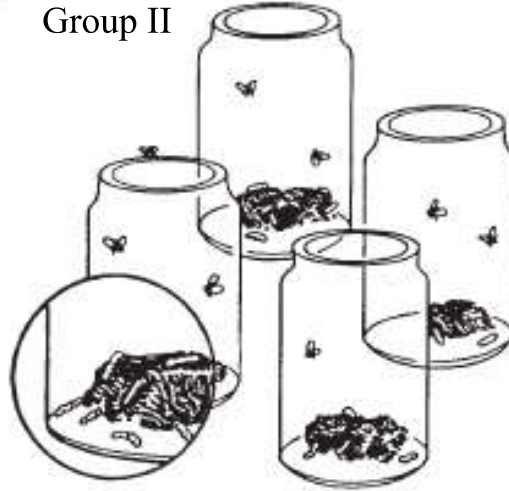
# Introduction to the Scientific Method Worksheets

Long ago, many people believed that living things could come from nonliving things. They thought that worms came from wood and that maggots came from decaying meat. This idea was called spontaneous generation. In 1668, an Italian biologist, Francesco Redi, did experiments to prove that maggots did not come from meat. One of his experiments is shown below.

Group I



Group II



Redi placed pieces of meat in several jars. He divided the jars into two groups. He covered the first group of jars with fine cloth. He left the second group of jars uncovered. Redi observed the jars for several days. He saw flies on the cloth of the covered jars, and he saw flies laying eggs on the meat in the uncovered jars. Maggots appeared only on the meat in the group of jars left uncovered.

## Questions

- Which is not a step in the scientific method?
  - Problem or question.
  - Research.
  - Ask other people for their opinion.
  - Arrive at a conclusion.
- What was the problem in Redi's experiment?
  - How do maggots appear in meats?
  - How do worms appear in wood?
  - Is spontaneous generation a valid explanation for maggots in meats?
  - All of the above are examples of problems.
- What do you think his hypothesis was?
  - Maggots grow through spontaneous generation.
  - Maggots come from eggs laid by flies.
  - Maggots find their way into woods and meats.
  - The problem cannot be solved.
- How did he test his hypothesis?
  - He placed food in two jars, covering one jar and leaving the other uncovered.
  - He placed food in two jars and left both jars uncovered.
  - He placed food in two jars and covered both jars.
  - He put food in one jar and no food in a second jar.

5. What was the variable in his experiment?
- Covering both jars.
  - Covering one jar and leaving the other uncovered.
  - Leaving both jars uncovered.
  - There was no variable in this experiment.

6. What do you think Redi's conclusion was?
- Living things come from other living things.
  - Living things are created through spontaneous generation.
  - He did not have enough data to arrive at a conclusion.

### Can You Spot the Scientific Method?

Each sentence below describes a step of the scientific method. Match each sentence with a step of the scientific method listed below.

\_\_\_ 7. Stephen predicted that seeds would start to grow faster if an electric current traveled through the soil in which they were planted.

\_\_\_ 8. Susan said, "If I fertilize my geranium plants, they will blossom."

\_\_\_ 9. Jonathan's data showed that household cockroaches moved away from raw cucumber slices.

\_\_\_ 10. Rene grew bacteria from the mouth on special plates in the laboratory. She placed drops of different mouthwashes on bacteria on each plate.

\_\_\_ 11. Kathy used a survey to determine how many of her classmates were left-handed and how many were right-handed.

\_\_\_ 12. Jose saw bats catching insects after dark. He asked, "How do bats find the insects in the dark?"

\_\_\_ 13. Justin wondered if dyes could be taken out of plant leaves, flowers, and stems.

\_\_\_ 14. Alice soaked six different kinds of seeds in water for 24 hours. Then she planted the seeds in soil at a depth of 1 cm. She used the same amount of water, light, and heat for each kind of seed.

\_\_\_ 15. Bob read about growing plants in water. He wanted to know how plants could grow without soil.

\_\_\_ 16. Kevin said, "If I grow five seedlings in red light, I think the plants will grow faster than the five plants grown in white light."

\_\_\_ 17. Angela's experiment proved that earthworms move away from light.

\_\_\_ 18. Scott said, "If acid rain affects plants in a particular lake, it might affect small animals, such as crayfish, that live in the same water."

\_\_\_ 19. Michael fed different diets to three groups of guinea pigs. His experiment showed that guinea pigs need vitamin C and protein in their diets.

\_\_\_ 20. Kim's experiment showed that chicken eggshells were stronger when she gave the hen feed, to which extra calcium had been added.

A. Recognize a problem

B. Form a hypothesis

C. Test the hypothesis with an experiment

D. Draw conclusions

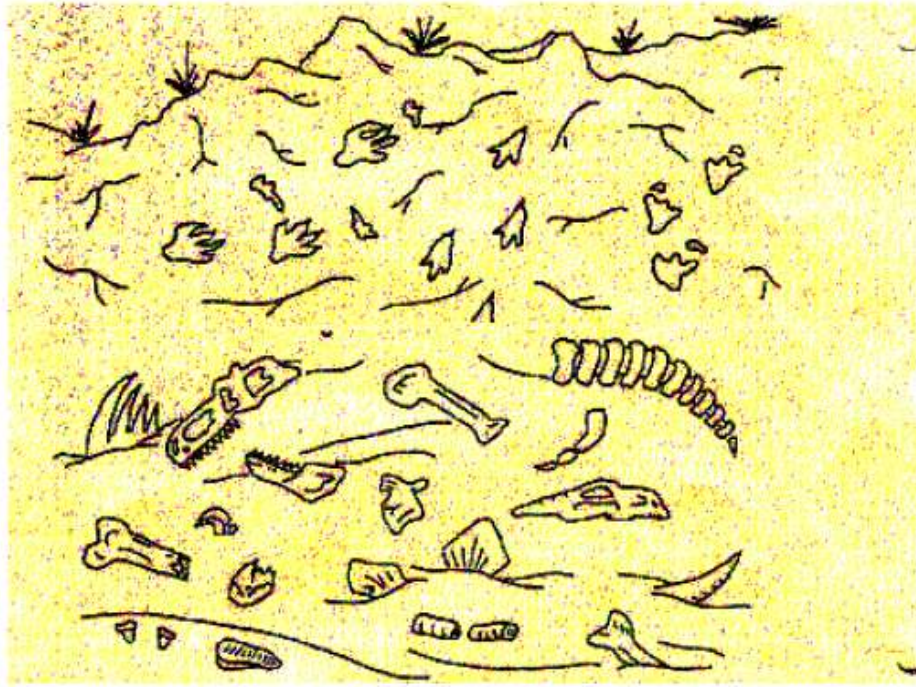
A time machine has been invented that travels into the past and takes pictures, sending them to the present. You are asked to look at one of the pictures and interpret what you see.

- \_\_\_ 1. The volcano is erupting.
- \_\_\_ 2. The camptosaurus is going to eat the stegosaurus.
- \_\_\_ 3. The stegosaurus will run into the water to escape.
- \_\_\_ 4. The camptosaurus is leaving tracks in the ground.
- \_\_\_ 5. The ground where the camptosaurus is walking is wet.
- \_\_\_ 6. There are plants growing in the water.
- \_\_\_ 7. The camptosaurus is going into the water to eat the plants.
- \_\_\_ 8. There is a tree growing next to the river.
- \_\_\_ 9. The tree looks like a palm tree.
- \_\_\_ 10. The climate is warm.
- \_\_\_ 11. The stegosaurus is eating the plant.
- \_\_\_ 12. The stegosaurus is an herbivore.
- \_\_\_ 13. There are bones from a dead animal by the shore.
- \_\_\_ 14. The camptosaurus killed the animal.
- \_\_\_ 15. Some more bones are in the water.
- \_\_\_ 16. The camptosaurus can't swim and will drown.
- \_\_\_ 17. Lava is coming down the sides of the volcano.
- \_\_\_ 18. The camptosaurus has sharp teeth for eating meat.

A. Observation

B. Inference

Suppose you are a paleontologist and you have just discovered a layer of rock with many fossils in it, both petrified bones and tracks.



Decide whether the following statements are observations or inferences.

19. \_\_\_\_ There are tracks from three different animals in the rock.

A. Observation

20. \_\_\_\_ One animal was chasing another animal.

B. Inference

21. \_\_\_\_ Two different animals died in this spot.

22. \_\_\_\_ When the animals walked here the ground was wet.

23. \_\_\_\_ One of the animals that died here had bony plates.

24. \_\_\_\_ One of the animals that died here had sharp teeth.

25. \_\_\_\_ The animal that had sharp teeth ate meat.

## Qualitative Observations vs. Quantitative Observations Worksheet

All of the observations in this worksheet were qualitative; that is, you observed a quality about an object (it smelled good, it was green, etc.). Another type of observation is quantitative, meaning that it can be described or measured in concrete numerical terms.



- The following observations are quantitative: There are 30 students in my class. I weigh 98 pounds. I ate a pound of potatoes.

Determine which of the following statements are quantitative and which are qualitative.

\_\_\_\_ 1. The cup had a mass of 454 grams.

\_\_\_\_ 2. The temperature outside is 250° C.

\_\_\_\_ 3. It is warm outside.

\_\_\_\_ 4. The tree is 30 feet tall.

\_\_\_\_ 5. The building has 25 stories.

\_\_\_\_ 6. The building is taller than the tree.

\_\_\_\_ 7. The sidewalk is long.

\_\_\_\_ 8. The sidewalk is 100 meters long.

\_\_\_\_ 9. The race was over quickly.

\_\_\_\_ 10. The race was over in 10 minutes.

A. Qualitative

B. Quantitative

## Key Vocabulary

**Analyze** – Examine data collected in an experiment to determine what it means.

**Conclude** – Reach a decision based on the analysis of data.

**Data** – Information collected during an experiment.

**Experiment** – A test that is done to determine if a hypothesis is correct or not.

**Hypothesis** – Your proposed answer to the question or solution to the problem.

**Inference (Infer)** – Coming to a conclusion based on your existing knowledge. (Example – seeing a student wearing a sports team jersey and concluding the student likes that team.)

**Observe** – Watch something carefully.

**Qualitative data** – Data dealing with descriptions; data is observed (colors, textures, smells, tastes, appearance, beauty, etc.).

**Quantitative data** – Data which can be measured (length, height, area, volume, weight, speed, time, temperature, etc.).

**Results** – Outcome of an experiment.

**Tentative** – Basic results that may or may not be accurate; basic results.

**Variable** – Something that can be changed.