

Science	Inference	Hypothesis
Control Group	Francesco Redi	Alexander Fleming
Eye Safety	Chemical Rules	Heating Rules
Atom	Element	Molecule
Compound	Chemical Formula	Balanced Equation
Chemical Properties	Physical Properties	Subatomic Particles
Chemical Changes	Physical Changes	Conservation of Mass

Name: _____

Start Date: _____

Test Date: _____

Scientific Investigations



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Science Vocabulary

Science	A systematically organized way of learning about or examining the natural world
Physical Science	A branch of natural sciences involving matter or energy
Biology	The study of living and once living organisms
Observation	The first step to carrying out scientific processes. Involves using at least one of the five senses (sight, sound, taste, touch, smell)
Inference	Uses prior knowledge to figure something out or to develop a hypothesis
Hypothesis	A testable statement that relies on information gathered from observations and inferences
Independent Variable	A variable in an experiment that the scientist deliberately changes (manipulated)
Dependent Variable	A variable in an experiment that the scientist observes for change or reaction (responding)
Experimental Group	A group or subject in an experiment that is tested by measuring responses to variables
Control Group	A group or subject in an experiment of which all variables are kept the same so others are measured against it
Theory	A well-supported explanation that is based on repeated experimentation, but is not proven
Atom	The smallest unit of an element
Element	Basic building block of physical matter; cannot be broken down to a simpler structure
Molecule	The smallest unit of a compound
Compound	A chemical substance composed of two or more atoms of elements
Physical Change	A change in the physical properties of a substance, which is usually reversible (freezing a liquid, melting a solid)
Chemical Change	A chemical reaction involving the rearrangement of the atoms of one or more substances, causing a change in chemical properties (forms at least one new substance; moisture causing rust to form on metal)
Conservation of Mass	The principle that states matter cannot be created or destroyed in a closed system, atoms may only be rearranged (balanced chemical equations)

A testable statement that relies on review and repetition	A logical assumption based on prior knowledge	A systematic way of investigating the natural world
Discovered penicillin by using the scientific method	Disproved spontaneous generation using a control group	Group or subject in an experiment that remains the same
<ul style="list-style-type: none"> -Use tongs/mitts -Never heat in a closed container -Unplug all equipment after use 	<ul style="list-style-type: none"> -Never mix chemicals -Never taste, touch or smell an unknown chemical -Be aware of all labels 	<ul style="list-style-type: none"> -Always wear goggles! -If working with chemicals or liquids, wear goggles with splash guards
Smallest unit of a compound	Simplest form of matter	Smallest unit of an element
Equation with equal number of atoms of each element on both sides	Written with symbols of elements and subscripts (CO ₂)	A chemical substance composed of two or more elements
Protons, electrons, neutrons	Melting point, boiling point, density, color	Reactivity (reacting with oxygen or acids)
Mass cannot be created or destroyed	Change in state of matter, size or shape (ice melts)	Creation of a new substance (color/temp change or formation of precipitate or gas)

Unit Review

1. Define science: _____
2. Describe the relationship between observations, inferences and hypotheses: _____
3. From what does an inference develop? _____
4. A hypothesis must always be _____
5. A student believes that eating a full breakfast will help his classmates produce more correct answers on a test. Describe the steps he would need to set up an experiment to test this hypothesis. What is the independent variable? The dependent variable? Which group would be the control group? _____
6. Describe the proper way to heat a substance: _____
7. What should be used to extinguish an electrical fire? _____
8. Define atom: _____
9. Give three examples of an element: _____
10. Define molecule: _____
11. Give three examples of a compound: _____
12. Describe the interactions that hold the atoms in a compound together: _____
13. Give at least two examples of evidence that a physical change occurred between two compounds: _____
14. Give at least two examples of evidence that a chemical change occurred between two compounds: _____
15. What is the difference between products and reactants? _____

Written assignment: The Law of Conservation of Mass states that mass cannot be created or destroyed. Using examples from this unit and at least two outside sources, how can you support this principle?

Unit Organizer



Pre-Check

- | | | | |
|----------|----------|----------|-----------|
| 1. _____ | 4. _____ | 7. _____ | 10. _____ |
| 2. _____ | 5. _____ | 8. _____ | 11. _____ |
| 3. _____ | 6. _____ | 9. _____ | 12. _____ |

Post-Check

- | | | | |
|----------|----------|----------|-----------|
| 1. _____ | 4. _____ | 7. _____ | 10. _____ |
| 2. _____ | 5. _____ | 8. _____ | 11. _____ |
| 3. _____ | 6. _____ | 9. _____ | 12. _____ |

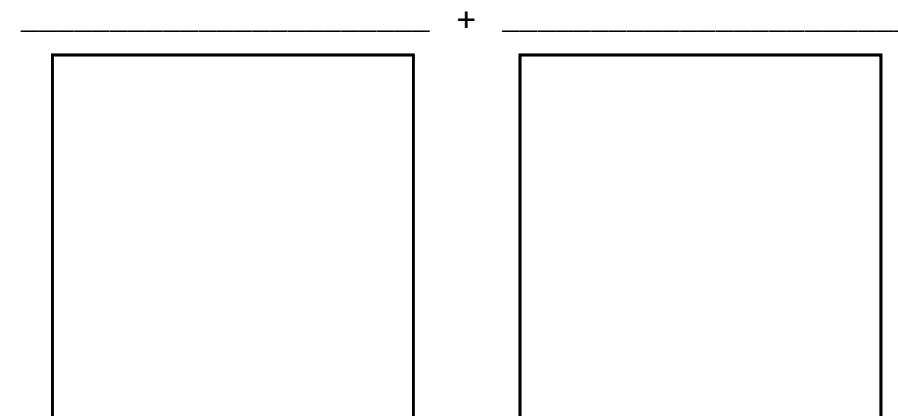
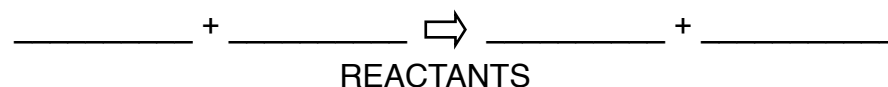
Bell Ringers

- Which of the following best describes _____?
Answer: _____
- Which of the following best describes the _____ between _____ and _____?
Answer: _____
- A _____ statement that arises from _____ is most likely which of the following?
Answer: _____
- Which of the following is an _____ of an _____?
Answer: _____
- Which best describes a _____?
Answer: _____
- _____ is a field of science that specifically studies which topic?
Answer: _____
- _____ changed the world when he discovered _____. How did this impact our modern world?
Answer: _____
- _____ performed an experiment by placing _____ in two environments. Why did he need to have two separate groups present in the _____?
Answer: _____
- Which is not a _____ practice in the _____?
Answer: _____
- What is the _____ thing you must do if an _____ occurs in the _____?
Answer: _____

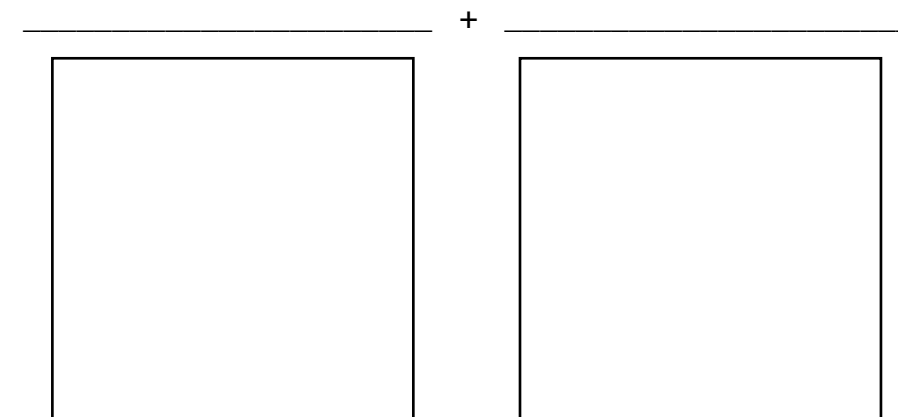
Conservation of Mass

- Conservation of mass:** Atoms in the _____ are rearranged to form the _____
- No _____ is created or destroyed!
 - Observable in a _____ system only
 - (When _____ are not released to atmosphere)
 - _____ of the products = _____ of the reactants

-Sample chemical reaction: _____



Products



Properties of Matter

-Matter: _____

-The fundamental unit of matter is an _____

-Atoms are made of 3 types of _____

Particle	Charge	Location	Mass

-Charge: _____

-The charge of the _____ is _____ and _____
the charge of the _____

-Neutral-has _____ numbers of _____ and _____

-Atomic # - _____

-Mass # - _____

Element: _____

-Over _____ represented on the periodic table

-About _____ found in _____ things.

-Represented by _____ (-C = _____)

-Living organisms are full of _____

- _____ - _____ - _____ - _____ - _____

Compound: _____

-When combined in a _____, elements change

-Example: NaCl – _____

-Separately: -Na = _____ -Cl = _____

-Represented by _____

-Symbols of _____

-Followed by _____ in which they occur

1. Define inference: _____

2. Define hypothesis: _____

3. Describe proper lab attire: _____

4. What is the smallest unit of an element? _____

5. Give three examples of compounds you may see on a daily basis: _____

Bell Ringers

11. A _____ atom can be described as which of the following?

Answer: _____

12. _____ are composed of three _____.

Which best describes their _____?

Answer: _____

13. Which is the best example of an _____ found in living

_____?

Answer: _____

14. Which best describes a _____?

Answer: _____

15. _____ and _____ combine to form

_____ (table salt). Which of the following best describes sodium chloride?

Answer: _____

16. A _____ change may _____ when

Answer: _____

17. A _____ change may _____ when

Answer: _____

18. How can someone _____ if a _____ equation is _____?

Answer: _____

19. Which _____ explains the law of _____ of _____?

Answer: _____

20. A chemical reaction occurs in which the _____ outweigh the _____.

How is this _____?

Answer: _____

What is Science?

- Science is _____
- Science begins by _____
 - _____ the _____
- Science is used to make important _____ and _____
- Science _____ to _____
 - It shows our _____ on _____
- The future of our world depends on _____
- As scientific knowledge progresses, so does each of the following:
 - _____
 - _____
 - _____
- Scientific knowledge is NOT _____
- it is reliant on _____ and can be subject to _____
- Observations: _____
 - Made by using _____
 - Observations gather _____, _____, and _____
- Inferences: _____
 - Use _____
- Experimentation: _____
- Hypothesis: _____
- Purpose: _____
 - May develop from _____
 - Use _____ and are _____
- Independent variable: _____
- Dependent variable: _____
- Every experiment must have a _____ group
 - Used to _____ the _____ group
- Describe Francesco Redi's experiment:

Describe Alexander Fleming's discovery:

Intro to the Lab

Understanding lab safety rules is one of the most important aspects of science. This list includes very important rules for the science lab, but you must always be sure to follow all rules and guidelines given by your teacher.

- #1 Rule: Notify _____ if ANY accident occurs
- #2 No _____ or _____ in the lab
- #3 Know the location of all _____ and how to use it
- #4 Read and understand all _____ or _____
- #5 _____ properly after each lab and store all _____

LAB ATTIRE: Come to labs _____ with the appropriate _____
- _____ shoes, no _____ clothing, _____ tied back

EYE SAFETY: _____ are required at all times
- _____ when working with any _____
-If anything contacts your eyes, go directly to the _____
-Flush with water for _____

HAND AND SKIN SAFETY: Be mindful of _____ substances
-Keep all _____ pointed away from yourself and others
-If you break _____, notify _____ immediately
-NEVER clean up _____ yourself
-If your skin gets _____, notify _____ immediately
-Wear _____ if instructed by your teacher
-Wash your hands after _____

HEATING SAFETY: Do not look into a container as you _____ it
-Do not point a heated _____ at anyone
-Do not leave a _____ source unattended
-Use _____ to handle heated substances
-Do not put _____ under _____
-Use the _____ to put out an electrical fire

CHEMICAL SAFETY: Read labels and store _____ properly
-Never touch, taste or smell _____ unless approved by the teacher
-Consider all chemicals _____
-Do not _____ chemicals!

I, _____, have read and understood all lab safety rules as instructed by _____ (teacher name). I have had the opportunity to ask questions pertaining to lab safety guidelines and I understand all consequences that may result from failing to follow them.

Student Signature

Date

Parent Signature

Date

LearnEd Notebooks is not responsible for any event that may occur in the lab or throughout this course. All instruction must be done by a certified science teacher in accordance with policies set forth by the school district by whom he or she is employed.