Fill in the Blanks using the Class Notes.

The purpose is that you understand the concepts.

The \_\_\_\_\_ and \_\_\_\_\_ *are absolutely compatible without the need to compromise.*

Many famous scientists sought to honor God by their endeavors:

Johann \_\_\_\_\_ (1571-1630) – Astronomer … *Awed by the power and wisdom of God, he once said that in his discoveries he was merely “thinking God’s thoughts after Him.*

Blaise \_\_\_\_\_ (1623-1662) – Mathematician (Pressure Law) …*…maintained that “the only perfect knowledge [comes] through Christian revelation”*

Robert \_\_\_\_\_ (1627-1691) – “Father of Chemistry” (atom) *…convinced that the Bible is a divine revelation.*

Sir Isaac \_\_\_\_\_ (1642-1727) … *Einstein once paid tribute to Newton by suggesting that*

*his own work would have been impossible but for the discoveries of Newton. “This most beautiful system of the sun, planets, and comets, could only proceed from the counsel and dominion of an intelligent and powerful Being.”*

Michael \_\_\_\_\_ (1791-1867) – Electromagnetism … d*evoutly believed that God was the maker and sustainer of all things and like Louis Pasteur was inspired in his scientific work by his simple but steadfast belief in the will of God.*

Wernher \_\_\_\_\_ (1912-1977) - NASA Rocket Engineer … “*There is certainly no scientific reason why God cannot retain the same position in our modern world that He held before we began probing His creation with the telescope and cyclotron.”*

\_\_\_\_\_ can similarly be approached in different ways, each yielding a different, valid, and yet \_\_\_\_\_ view of the subject.

Four main branches of Science (based on the hand):

\_\_\_\_\_ (arteries, veins, cells)

\_\_\_\_\_ (composition, structure)

\_\_\_\_\_ (movement)

\_\_\_\_\_ (life form & environment)

Chemistry (focuses on):

* the study of the composition, structure, and properties of \_\_\_\_\_;
* the \_\_\_\_\_ that matter undergoes,
* and the \_\_\_\_\_ changes that accompany these processes.

Is Air real? Reasons to study chemistry:

Chemistry can be useful in explaining the natural world, preparing people for career opportunities, and producing informed citizens based on \_\_\_\_\_ (energy, matter).

\_\_\_\_\_ is the means by which a society provides its members with those things they need and desire.

Modern research in chemistry can lead to technologies that help man produce food and energy, improve human life, and expand our knowledge of the universe.

An Experimental Approach to Science

Alchemists developed the tools and techniques for working with chemicals.

They designed equipment that is still in use today, including beakers, flasks, tongs, funnels, and the mortar and pestle.

Antoine-Laurent Lavoisier

French scientist in the late 1700’s who revolutionized the science of chemistry. He helped to transform it from a science of observation to the science of \_\_\_\_\_ that it is today; *E.g. he designed a balance that could measure mass to the nearest 0.0005 gram.*

He also settled a long-standing debate about how materials burn. He was able to show (\_\_\_\_\_) that oxygen is required for a material to burn. *Because oxygen is invisible, people did not consider it as real.*

Science proceeds by \_\_\_\_\_ and \_\_\_\_\_.

Science is fallible because of fallen man.

What was scientifically thought true in the past is sometimes superseded by later scientific discoveries.

There is no place for arrogance in real science. We must *always* be willing to be proved wrong.

A consistent need in science is the \_\_\_\_\_.

\_\_\_\_\_ IS IMPORTANT BECAUSE … We tend to make poor \_\_\_\_\_. Observations (including hearing) are very crucial to \_\_\_\_\_ data collection and solving of problems

SCIENCE IS IMPORTANT BECAUSE … We often make observations with \_\_\_\_\_. In other words, we have a \_\_\_\_\_ solution BEFORE observing. OR we make the observation FIT INTO OUR already \_\_\_\_\_ mindset.

The Nature of a Scientific Law:
An educated guess, confirmed over and over again by \_\_\_\_\_.

Give the proper order of the Scientific Method: O\_\_\_\_, H\_\_\_\_, E\_\_\_\_, T\_\_\_\_, L\_\_\_\_

**Scientific Method**

\_\_\_\_\_ (using senses) includes \_\_\_\_\_ and collecting \_\_\_\_\_.

This leads to proposed solutions (\_\_\_\_\_). We want to know the answer to our questions.

This leads to \_\_\_\_\_ (testing our proposed solution). 1 John 4:1

When experimentation (testing) can be repeated again and again and we recognize a \_\_\_\_\_, our rationale minds want an \_\_\_\_\_ (\_\_\_\_\_).

When events in \_\_\_\_\_ are repeated without any exception, a scientific \_\_\_\_\_ is formulated.

\_\_\_\_\_: possible solution based on accurate observation.

Experiment: “controlled” \_\_\_\_\_ of the hypothesis.

\_\_\_\_\_: repeatable pattern, giving explanation of observations.

Scientific \_\_\_\_\_: concise \_\_\_\_\_ of observations and experiments found in nature that have not yet been refuted.

Disproving poor “science”

Spontaneous generation of microscopic organisms

Jean Baptiste Lamarck (1744-1829) … FALSELY believed that as creatures strive for greater perfection and move up the evolutionary “ladder,” new organisms arise, by spontaneous generation, to fill the vacated places on the lower rungs.

Disproof of the \_\_\_\_\_ ideas of spontaneous generation (life coming from non-living material) is no longer controversial among professional biologists.

YET, Evolutionists still claim that life arises in simple form from nonlife by way of a long and complicated series of chemical steps.

This is NOT good science.

~~Spontaneous generation of microscopic organisms~~

John Needham (1713-1781) believed a “Life force,” able to trigger spontaneous generation, existed in molecules of all inorganic matter. Boiling broth too long killed the life force.

Sealing the flask prevented air from reaching the broth, which was also needed for the life force to work to spontaneously create life.

*By 1860, the debate was so heated that the Paris Academy of Sciences offered a prize for any experiments that would prove or disprove spontaneous generation.*

In 1864, Louis Pasteur won the prize for his experiment which \_\_\_\_\_ spontaneous generation of microscopic organisms.

1864 - used broth in swan-necked flasks and flasks with cotton balls in the ends.

Air was able to enter flasks, but microorganisms were filtered out. *Some of his flasks on display today, in France, are still sterile.*

**Information Overload**

How do we process so much information? How do we collect, organize, and analyze observations and data?

Scientist use reports, tables, charts, and \_\_\_\_\_.

An \_\_\_\_\_ variable is the variable that is \_\_\_\_\_ changed or controlled in a scientific experiment. It is used to test the effects on the dependent variable.

A \_\_\_\_\_ variable is the variable being \_\_\_\_\_ and \_\_\_\_\_ in a scientific experiment. Its value depends on the value of the independent variable, and it will change as the independent variable’s value changes.

The independent variable is graphed on the \_\_\_ axis.

The dependent variable is graphed on the \_\_\_ axis.

Every valid experiment needs a “\_\_\_\_\_”. What does that mean?

In a valid experiment only \_\_\_\_\_ variable can be tested at a time in order to isolate or compare the results.

An experiment where all aspects involved in the experiment are treated exactly the same except for \_\_\_\_\_ deviation, is an example of a controlled experiment.

*The control is the* \_\_\_\_\_ *Variable in which all factors remain the same except what is being tested for.*

\_\_\_\_\_ and Communication

Science progresses when scientists collaborate. \_\_\_\_\_ insight and expertise increases the \_\_\_\_\_ of observations and conclusions, and the ability to solve scientific problems.

Scientists publish their research results in scientific \_\_\_\_\_ where they are reviewed by experts in the author’s field.

Iron sharpens iron (Proverbs 27:17).

“AGES”

Solving word problems involves analysis, calculation, and evaluation:

A 🡪 What is the problem “\_\_\_\_\_” for?

G 🡪 What is “\_\_\_\_\_” in the problem?

E 🡪 What “\_\_\_\_\_” is best to use?

S 🡪 \_\_\_\_\_ the problem and ask, Does your answer make “\_\_\_\_\_”?