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## EARTH SCIENCE – UNIT 1 – CHAPTER 1 NOTES

### THE NATURE OF SCIENCE

#### 1.1 Sciences

Science = “having knowledge”

Technology = “the use of scientific discoveries for practical purposes”

Major sciences = Earth science, biology, chemistry, physics

All the major sciences are inter-related

#### 1.1 The Four Branches of Earth Science

Geology = the study of Earth, its matter, and the processes that form and change Earth

EX: volcanoes, earthquakes, maps, fossils, landforms, rocks, minerals, Earth’s history

Meteorology = the study of weather and the forces and processes that cause it

EX: storm patterns, climates, atmosphere, weather

Astronomy = the study of objects in space, including stars, planets, and comets

EX: stars, planets, comets, moon phases, seasons

Oceanography = the study of Earth’s oceans

EX: ocean water, currents, tides, waves

#### 1.1 The Scientific Method

scientific method = a series of problem-solving procedures used by scientists

1. Determine the problem. (What do you want to find out?)
2. Gather information. (Research background knowledge about your problem.)
3. Make a hypothesis. (Write down an educated prediction to the problem.)
4. Test your hypothesis. (Perform an experiment. Follow a procedure to see if your hypothesis is correct.)
5. Analyze the results. (Present data using tables, charts, graphs, etc. Interpret the data by trying to find out what the data means)
6. Draw conclusions. (Explain the results of the experiment. State whether or not your hypothesis was correct.)

Variable = a changeable factor in an experiment

An experiment can only test 1 variable at a time. (NO EXCEPTIONS!)

Constants = all the parts of the experiment that stay the same among the different groups

Control Group = a standard for comparison in an experiment

This is the part of the experiment that does not change

Experimental Group = the part of the experiment that is changed by the variable

Theory = an explanation backed by results obtained from repeated tests or experiments

Scientific Law = a rule of nature that describes the behavior of something.

Can be observed, but not proven!

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### 1.1 Problem-Solving Strategies

trial-and-error  
identify a problem  
eliminate possibilities  
make predictions  
organize information (tables, charts, etc...)  
recognize patterns  
make a model  
use a drawing  
use critical thinking skills  
analyze a situation  
evaluate all possibilities  
determine what information is important  
share ideas with others

### 1.2 Limits of Science

ethics  
bias  
being objective

### 1.2 Measurements

Length = the distance between two points (meter ... ruler)  
Mass = the amount of matter in an object (gram ... balance)  
Weight = a measure of the gravitational force on an object (Newton ... balance)  
Area = the amount of surface included within a set of boundaries (meters squared ... ruler)  
Volume = the amount of space an object occupies (liter ... graduated cylinder or beaker)  
Density = the amount of matter that occupies a particular space (grams per milliliter ... balance and graduated cylinder or beaker)  
Temperature = a measure of how hot or cold something is (a measure of how quickly the molecules are moving around) (degrees ... thermometer)

### 1.2 SI Prefixes

K – H – D – B – D – C – M  
King – Henry- Died – Before – Drinking – Chocolate - Milk  
Kilo – Hecto – Deca – Base – Deci – Centi – Milli

### 1.2 The Four Safety Rules in Earth Science

Read the directions.  
Follow the directions.  
Ask the teacher for help.  
ALWAYS USE COMMON SENSE!