Packet 1: Introduction to Biology
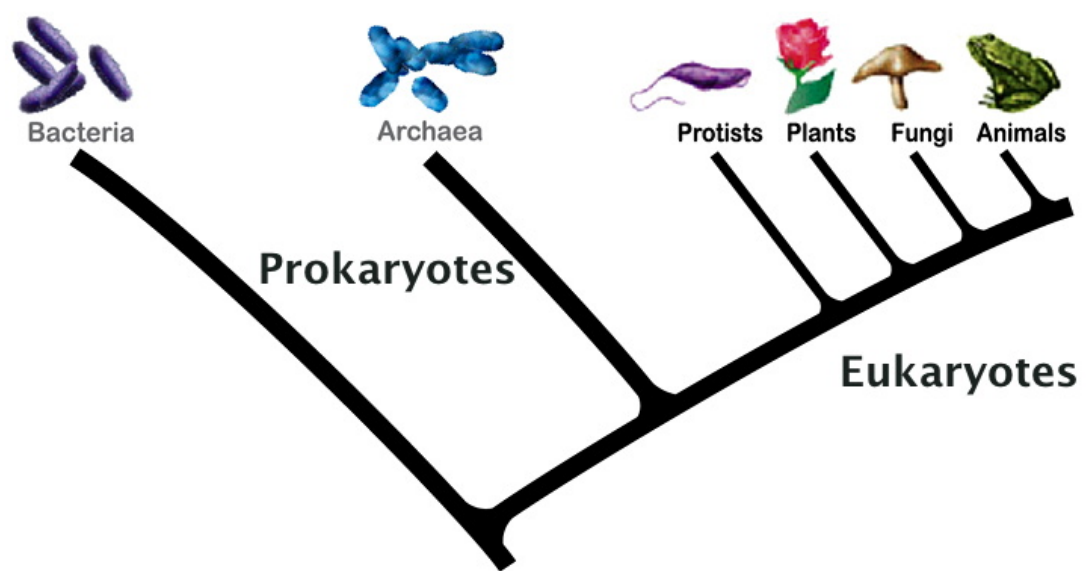
Notes: The Scientific Method

I. **What is Biology?**

- bio = _____   –ology = _____, therefore biology is

_____

- **What are the Characteristics of Life?**

- All living things are classified into one of 6 Kingdoms. These kingdoms are:
    - 2 _____kingdoms - single celled and no nucleus (prokaryote)
    - _____ - single celled with a nucleus (eukaryote)
    - _____ - multicellular and eukaryotic, cell wall, decomposer
    - _____- multicellular, eukaryotic, cell wall, producer
    - _____ - multicellular eukaryotic, consumers

A _____ is a tool used to identify the scientific name of an organism.
Under each picture, write the correct scientific name of the organism

green   green   green

_____   _____   _____

purple   purple   purple

_____   _____   _____

1.	Has green colored body ......go to 2
	Has purple colored body ..... go to 4
2.	Has 4 legs .....go to 3
	Has 8 legs .... *Deerus octagis*
3.	Has a tail .... *Deerus pestis*
	Does not have a tail ..... *Deerus magnus*
4.	Has a pointy hump ...... *Deerus humpis*
	Does not have a pointy hump.....go to 5
5.	Has ears ....*Deerus purplinis*
	Does not have ears ......*Deerus deafus*

Scientific names have two words – _____ and _____. The first word is the genus. The second word identifies the species.

Example: Homo sapiens   - Homo is the genus, sapiens is the species.

The scientific name of a grizzly bear is Ursus arctos.

What genus does the grizzly bear belong to?

_____

In the dichotomous key above, what genus do all of the

organisms belong to? _____

Parts of an Experiment

Part of the experiment	Definition	Identify this in the Seed Lab
_____ or **manipulated variable**	the **ONE** thing you change in the setup	
_____ or **responding variable**	Data or what you measure	
_____ **group**	Group that does not receive treatment. What you compare your results back to.	
_____ **group**	Group(s) that receive the treatment (test groups).	
_____ **variables (constants)**	Things that are kept the same between all the setups	

Additional things to note:
- 2 criteria for a hypothesis are: _____ & _____

   *Ex: **If** a plant is grown under white light, **then** it will grow more rapidly than a plant under green light **because** green light is reflected by plants and not absorbed.*

- 2 types of data:
   - Quantitative data = _____ ; Qualitative data = _____

III.   Steps of the Scientific Method

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

IV.   Notes: Hypothesis, Theory, Law, Observation & Inference what's the difference?

Term	Definition	Example
	An educated guess about what you think will happen.	
	A very well supported explanation of something that has been observed. It tries to explain why something is happening. It can never really be proven, just highly supported by data.	
	A description of something that has been observed. It is known to be true.	
	A statement based on what you see. Does not try to explain.	
	A logical interpretation of what you see based on prior knowledge.	

V.   Notes: Organizing Data

Line & Bar Graphs – shows the relationship between two variables

○ **Independent variable** –placed on the **_____** (horizontal axis).

○ **Dependent variable** – always placed on the **_____** (vertical axis).

○ **_____** – used to compare two or more sets of data, multiple lines.

○ **_____** – tells what the graph is about and should be a concise statement.

○ **_____** – the scale on both the x and y-axis usually begin with zero

(some exceptions include time/dates).

▪ Values must increase by equal spacing and the same numeric intervals.

▪ Do the X and Y axes have to have the same scale (i.e. jump by the same interval)? _____

Line Graph

1. Use the line graph in **Figure 2** to answer questions A through F below. **Make sure to put in your units after your numbers!!!!**

   A.   Which plant grew the tallest? _____

   B.   How many plants grew to be at least 6 cm tall? _____

   C.   Which plant grew the fastest in the first five days? _____

   D.   What is the dependent variable? _____

   E.   After 10 days, how much had plant 3 grown? _____

   F.   How long did it take for plant 1 to grow 6 cm? _____

   G.   Why is it a benefit to put multiple lines on one graph? _____

Growth of Plants

Plant 1 ————
Plant 2 ----------
Plant 3 ——————
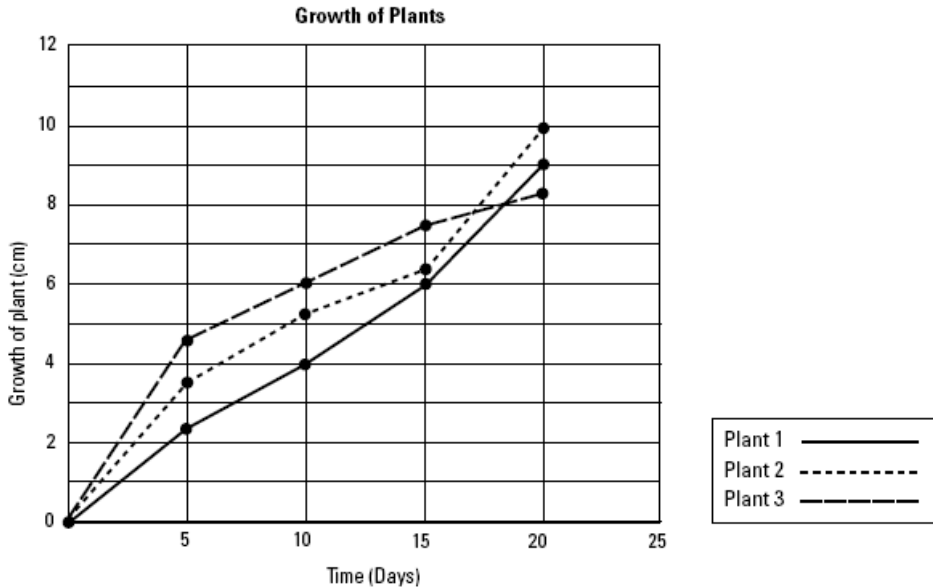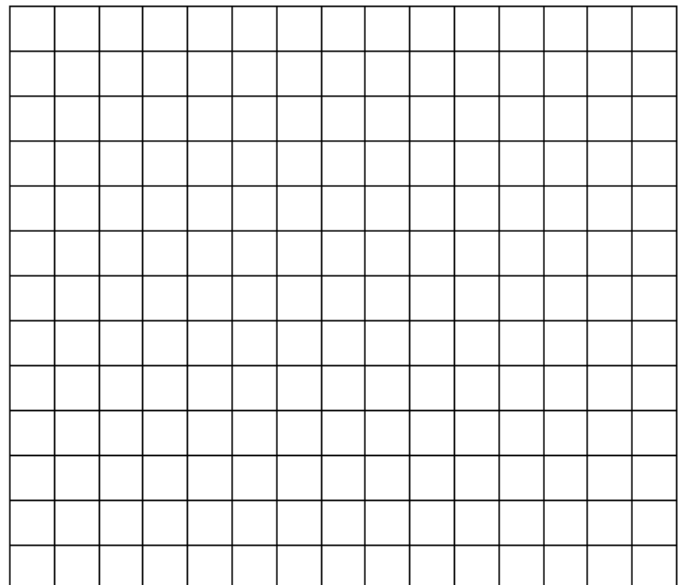
Growth of plant (cm)

Time (Days)

Figure 2

2. Use the information recorded in **Data Table 1** to construct a **LINE** graph on the grid provided below. You should label each axis, mark an appropriate scale on each axis, plot the data, connect the points, and give your graph a title.

Temperature (°C)	Breathing rate (per 5 minute)	
	Guppies	Goldfish
10	15	8
15	25	13