**Biology Unit 1 Study Guide** **Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Part 1- Vocabulary**

|  |  |
| --- | --- |
| 1. \_\_\_\_\_ Being doubtful about the truth of something  2 \_\_\_\_\_ The Study of Life  3 \_\_\_\_\_ The study of Animals  4. \_\_\_\_\_ The study of Plants  5. \_\_\_\_\_ The study of interactions of organisms with their environment  6. \_\_\_\_\_ The study of how organisms change over time  7. \_\_\_\_\_ The study of naming and classifying organisms  8. \_\_\_\_\_ The study of heredity  9. \_\_\_\_\_ Energy use (sum of all chemical reactions)  10. \_\_\_\_\_ Maintaining stable internal conditions  11. \_\_\_\_\_ Using the 5 senses to monitor an experiment  12. \_\_\_\_\_ A logical interpretation based on observations and experience  13. \_\_\_\_\_ A testable statement of what you believe will happen  14. \_\_\_\_\_ Multiple factors that are kept constant in an experiment  15. \_\_\_\_\_ The comparison group  16. \_\_\_\_\_ The variable that is changed/tested  17. \_\_\_\_\_ What is measured  18. \_\_\_\_\_ A statement that links together many well-supported hypotheses  19. \_\_\_\_\_ The now disproven belief that living things could arise from non-living things  20. \_\_\_\_\_ The theory that living things arise only from other living things  21. \_\_\_\_\_ Microscope that uses multiple lenses and a light to examine living organisms.  22. \_\_\_\_\_ Microscope that passes electrons through a prepared specimen produce a computerized image 1000s of times magnified.  23. \_\_\_\_\_ Anything with mass that takes up space.  24. \_\_\_\_\_ Pure substance that can’t be broken down any further  25. \_\_\_\_\_ The center of the atom  26. \_\_\_\_\_ The universal solvent  27. \_\_\_\_\_ Part of solution that gets dissolved  28. \_\_\_\_\_ Part of solution that does the dissolving  29. \_\_\_\_\_ When water molecules hydrogen bond to each other  30. \_\_\_\_\_ Organic compounds that make up all living things  31. \_\_\_\_\_ A protein that speeds up reactions  32. \_\_\_\_\_ Compound that binds to the active site  33. \_\_\_\_\_ The term given to describe how things bind to an active site  34. \_\_\_\_\_ The blueprint of life  35. \_\_\_\_\_ Molecule that can bond in long chain, repeating units  36. \_\_\_\_\_ Process of adding monomers to form long chain of repeating units | 1. Zoology 2. Hypothesis 3. Element 4. Taxonomy 5. Skepticism 6. Botany 7. Nucleic acids 8. Solute 9. Control Group 10. Water 11. Controls/ Constants 12. Independent Variable 13. Electron 14. Monomer 15. Matter 16. Inference 17. Polymerization 18. Evolution 19. Enzyme 20. Cohesion 21. Substrate 22. Lock and key 23. Nucleus 24. Solvent 25. Biology 26. Genetics 27. Compound Light 28. Spontaneous Generation 29. Theory 30. Dependent Variable 31. Hypothesis 32. Metabolism 33. Homeostasis 34. Ecology 35. Observation 36. Macromolecules 37. Biogenesis |

**Part 2- Intro to Science questions**

1. a. List the 8 Characteristics that all living organisms have: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. **Circle the one that means “Maintaining stable, internal conditions”**

c. **Put a box around** the term that means “**energy use/the sum of all chemical reactions in an organism is a life**”

2. The smallest units that can carry on all functions of life are called a) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. These group together to make **tissues.** Groups of tissues work togetherto make b) \_\_\_\_\_\_\_\_, which together compose **organ systems.**

3. ***Write “S” for scientific or “NS” for non-scientific beside the following descriptions or examples.***

a) Supernatural\_\_ b) Testable \_\_ c) Measurable\_\_ d) Subjective (Opinion) \_\_\_ e) Falsifiable \_\_\_

f) Open to change \_\_\_g) Observable\_\_ h) The lochness monster does not exist \_\_\_ i) Red looks better than orange \_\_\_

j) The Ford fusion gives off less carbon dioxide than the Honda Accord \_\_\_

4. How many variables can be changed at a time? \_\_\_\_\_

**Scientific Method Table**

|  |  |
| --- | --- |
| ***STEPS*** | ***EXAMPLE*** |
| **1. Observation– \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  a. Data– evidence from observations  i. Pre-experimental ii. Post-experimental = Results  b. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – Logical interpretation based on observations and prior knowledge or experience (If you see smoke, there is….) | ***OBSERVATION: Many people take a vitamin supplement every day.***  ***INFERENCE: Vitamins help people grow so maybe they will also help plants grow*** |
| **2. Identify the Problem/Question** | ***QUESTION:*** *Does vitamin water help plants grow taller than “regular” water”?* |
| **3. Form a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  a Testable statement of what you believe will happen  b. Prediction: Restate in “if…then format” | ***HYPOTHESIS: V****itamin water will* ***cause the plant to grow taller than regular water***  ***PREDICTION: IF*** *I water a plant with vitamin water* ***THEN*** *the plant will grow taller* |
| **4. Design Experiment**  a. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Group: What you keep the same. For comparison  b. **Experimental Group**: Change only what you are testing for (only change 1 variable at a time)  i. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_variables/constants: What you keep the same  ii. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_variable: What **you change**  iii. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_variable: What is affected by the change (WHAT **YOU measure**) | ***CONTROL GROUP: Plant with no vitamin water***  ***EXPERIMENTAL GROUP: Plant with vitamin water***  *i. CONTROLS: Same amount of water, sunlight, temperature, plants, soil…*  *ii. INDEPENDENT: Vitamin water*  *iii. DEPENDENT: Growth of plant****\_*** |
| **5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **- Use graphs and charts to organize experimental Data**  -MEASURED IN **SI** (STANDARD INTERNATIONAL UNITS) units. Base units: LENGTH = meter, Volume = liter, mass = gram  **\_\_\_\_\_\_\_** = 1/100, **\_\_\_\_\_\_**= 1/1000, **\_\_\_\_\_\_** = 1000  A CENTIMETER = **1/100**  OF A METER  a. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Shows change over time; All **quantitative** data (numbers)  b. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: For comparisons; Can include **qualitative** data (i.e. color)  c.Pie chart: Show relationship to a whole (shows %) |  |
| **6. Form Conclusions**   * Relate back to your hypothesis (It supported/did not support…) * Not proven, only disproved or supported | **CONCLUSION:** THE VITAMIN WATER DID NOT MAKE THE PLANT GROW TALLER. The hypothesis that vitamin water would make plants grow taller was **not supported.** |
| **7. Publish results** - So others can test and build-off of your work | Published in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**QUESTION #s 5-13 – *While preparing a sandwich, you notice mold growing on the bread. You wonder why there is mold growing on the bread and also how you can prevent it. You believe that mold will grow slower at lower temperatures. You take two pieces of the same bread and put one in the refrigerator and put the other in a cabinet. You make sure each piece receives no light and is not exposed to moisture. At the end of one week you examine to see which bread appears to have more mold by measuring the distance the mold has spread across the bread. Indicate the.***

5. Observation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Question: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Hypothesis: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. Control group: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. Controlled variables/Constants: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. Experimental group: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11 Independent/Manipulated variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12 Dependent/Responding variables: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13. Was the data quantitative or qualitative? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Explain. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14. ***Sally believes that green light will make plants grow taller than white light. She sets up an experiment to test this idea. She takes two of the same types of plants and puts them in the same room. She gives them each the same amount of water and fertilizer at the same times of day. One plant is placed under a green light while the other is placed under a white light at the same light intensity. After 1 week, she measures the results. Indicate the:***

a) Hypothesis \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) 3 controls/constants \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c) Control group\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d) Experimental group \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e) Independent/manipulated variable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

f) Dependent/responding variable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***15. Assuming the plant with green light grew 3 cm, and one in white light grew 8 cm:***

a) Construct a bar graph of your results

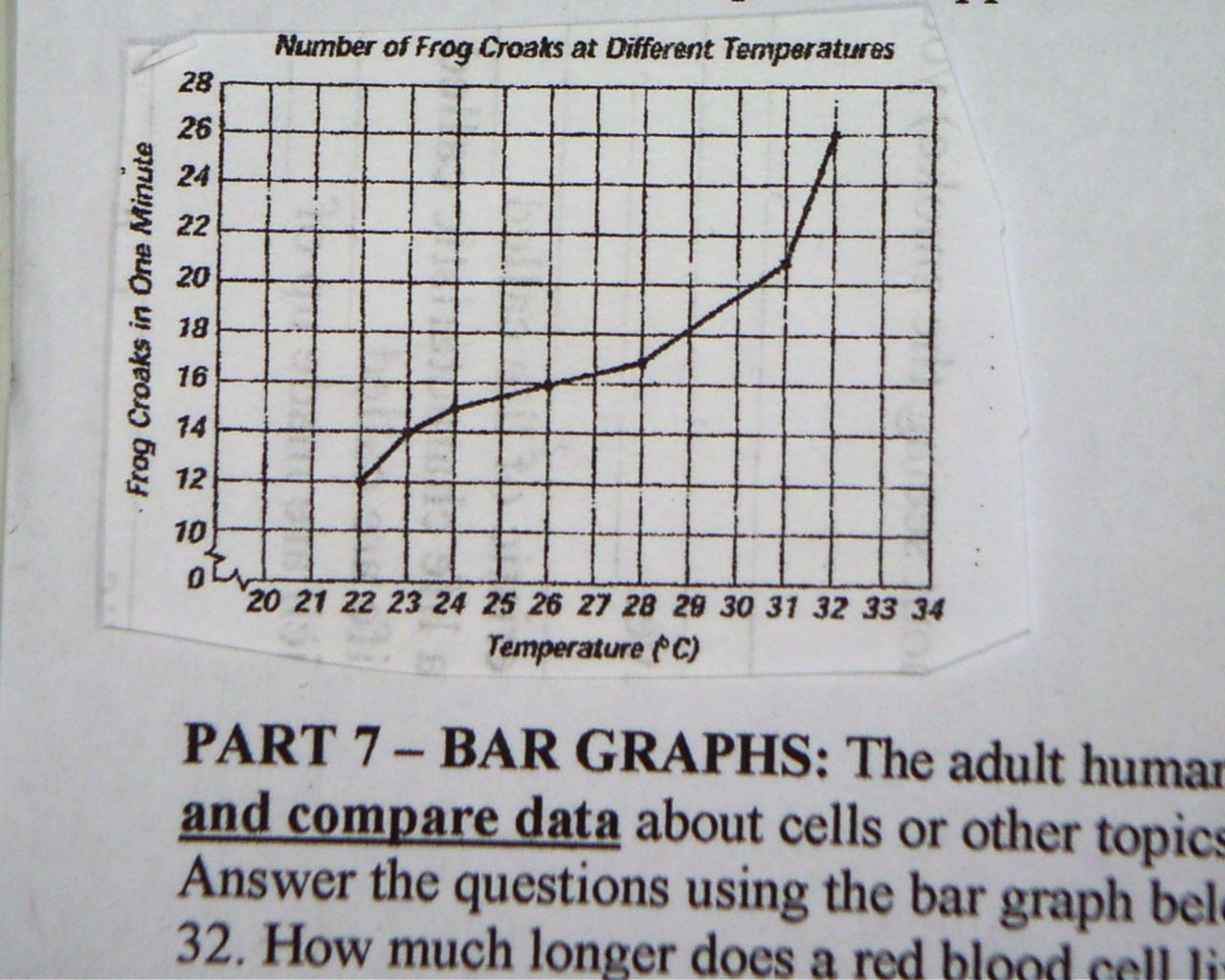
b) State your conclusions. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**16. *Redi attempted to disprove spontaneous generation (that life arose from non-life) by placing pieces of meat in two jars. He covered one jar with a mesh and did not cover the other one. He used the same type and amount of meat, the same type of jar, and put both jars in the same location for the same amount of time. Indicate the****:*

a) Control group: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ b) Independent variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c)Dependent variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ d)Controlled variables/constants:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

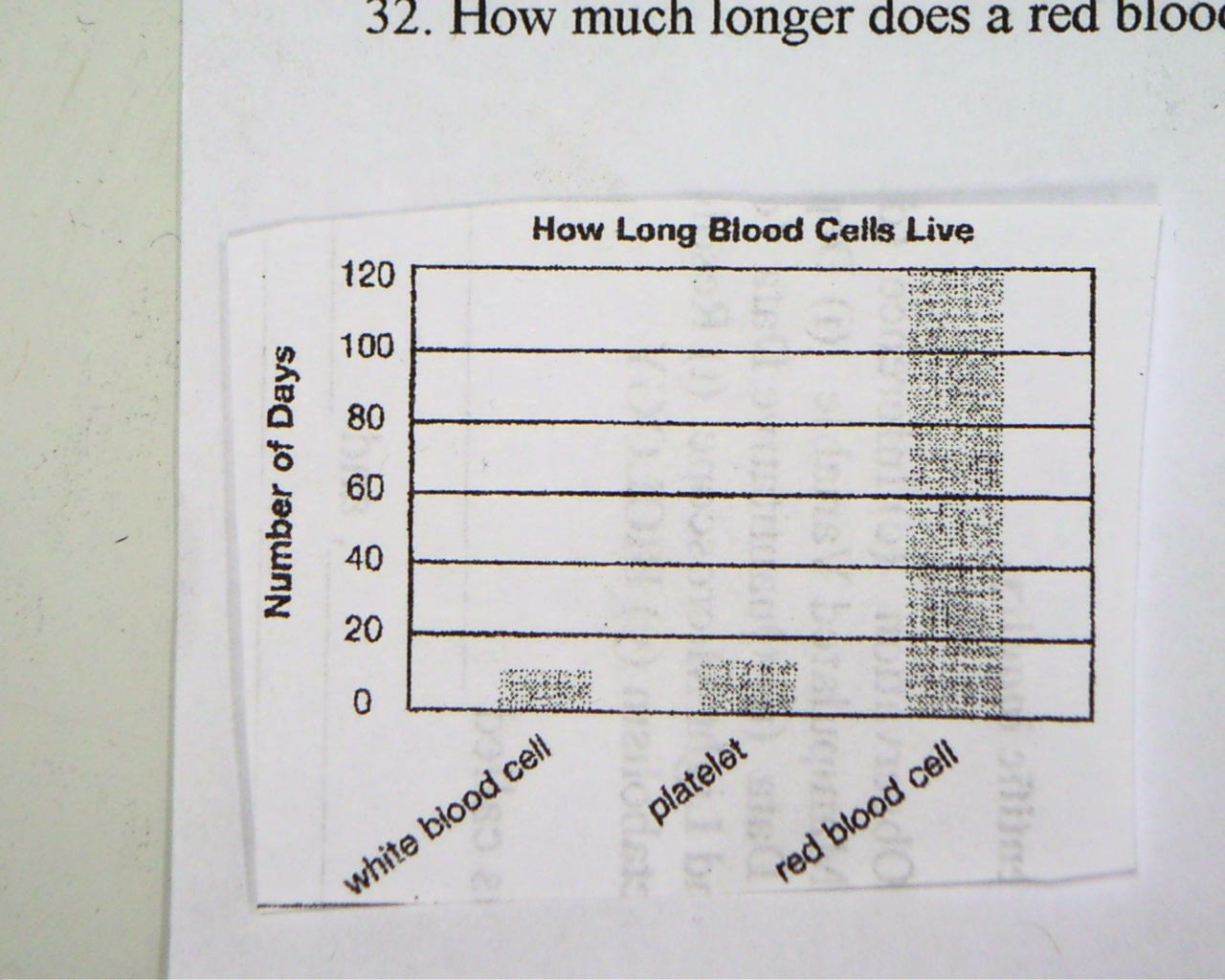
17. Give the SI units for the following: Mass = \_\_\_\_\_\_\_\_\_\_\_, Length = \_\_\_\_\_\_\_\_\_\_, Volume = \_\_\_\_\_\_\_\_\_.

18.What is the magnification of a compound, light microscope if the ocular lens is 10X and objective lens is 30 X? \_\_\_\_

**Part 3 – Graphs -** LINE GRAPHS – A science class studying frogs counted the number of times the frogs croaked at different temperatures. The results are shown in the data table on the right. A line graph was used to plot the data, since it **displays how one set of data changes in response to another** set. Examine the line graph below to answer the following:

19. What is the dependent variable on the line graph? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Independent variable? \_\_\_\_\_\_\_\_\_\_\_

20. At what temperature do the frogs croak the most? \_\_\_ Least? \_\_\_\_



21. What would you expect to happen if the temperature continued to increase? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The adult human body is made up of trillions of cells. You can **use bar graphs to organize and compare data** about cells or other topics. The bar graph to the left shows how long different kinds of blood cells live. Answer the questions using the bar graph below.

22. How much longer does a red blood cell live than a platelet? \_\_\_\_\_

23. Which blood cell lives the least amount of time? \_\_\_\_\_

**Part 4- Chemistry Questions**

24. What is formed when 2 or more elements chemically combine? \_\_\_\_\_\_\_\_\_\_\_\_\_Write an example\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

25. In a saltwater solution, water represents the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and salt represents the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

26. What do the following formulas represent? CO2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ C6H12O6 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ H2O\_\_\_\_\_\_\_

27. A water molecule is slightly charged on either end and is therefore called a/an \_\_\_\_\_\_\_\_\_\_\_ molecule.

28. What type of bond does this characteristic (from # 4) lead to? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

29. When 2 like substances (i.e. water to water) form this bond with each other it is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

30. When 2 unlike substances form this bond with each other it is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

31. On the pH scale, \_\_\_ is neutral. A substance with a pH below 7 is a/an\_\_\_\_\_ while above 7 is a/an \_\_\_\_\_\_.

32. A substance with a pH of 3 is \_\_\_ more acidic than a pH of 6.

33. What element is known as the “backbone” of life? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

34. What other elements are found in organic compounds? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

35. Identify the building blocks (monomers) of:

a) Carbohydrates (sugars) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ b) Lipids (fats)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c) Proteins \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ d) Nucleic Acids \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

36. Identify the organic compound that the following are examples of:

a) DNA and RNA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ b) Enzymes\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ c) Waxes and Steroids \_\_\_\_\_\_\_\_\_\_\_

d) Glucose, Sucrose, Starch, Cellulose \_\_\_\_\_\_\_\_\_\_\_ e) Hemoglobin, Keratin\_\_\_\_\_\_\_\_\_\_ e) Fats and Oils \_\_\_\_\_\_\_\_\_\_

37. Identify the organic compound that matches the functions below:

a) Carries hereditary information \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ b) Catalysts\_\_\_\_\_\_\_\_\_\_\_ c) Energy reserves \_\_\_\_\_\_\_\_\_\_\_\_\_

d) “Building blocks” of cells \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ e) Composes the cell membrane \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

38. Identify the primary organic compound in the foods listed below:

a) Candy \_\_\_\_\_\_\_\_\_\_\_\_\_\_ b) Bread \_\_\_\_\_\_\_\_\_\_\_\_\_\_ c) Meat \_\_\_\_\_\_\_\_\_ e) Cooking oil \_\_\_\_\_\_\_\_\_\_\_\_\_

39. Which food (from # 6) would be best for: a) Building muscle \_\_\_\_\_\_\_ b) Quick energy \_\_\_\_\_\_\_\_\_

40. In the reaction C6H12O6 + 6O2 🡪 6CO2 + 6H2O + 36 ATP. Identify the: a) Reactants: \_\_\_\_\_\_\_ b) Products \_\_\_\_\_\_\_\_\_

c) Is this an endergonic or exergonic reaction (Hint ATP (energy) is being formed/released)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

41. A substance that speeds up reactions by lowering activation energy is called a/an\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. In a living organism, this substance is called a/an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It is an example of what organic compound? \_\_\_\_\_\_\_

42. The model which describes how these substances (from # 8) work is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ model.

43. How many times can an enzyme be used? \_\_\_\_\_\_\_\_\_\_\_\_\_ How many substrates can it work with? \_\_\_\_\_\_\_\_\_

44. If temperature or pH changes too much, what happens to the enzyme? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

45. List 3 examples of enzymes. Underline the suffix. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_