

SUMMER REVIEW PACKET

Due first day of AP Biology Class 2021 for your first grade

As you already know, 'science' describes two things: a process used to explain observations and answer questions about the natural world, and the body of knowledge resulting from that process. In order to dive right into AP Biology in the fall, you will need to do a little work over the summer: practice your graphing skills and review some basic chemistry.

I. Graphing Skills

A. Install Logger Pro onto your laptop computer

Here are links to download the software from Vernier Software & Technology. Select Windows or Mac depending on your computer and download the free version. Then open and install on your computer.

<https://www.vernier.com/downloads/logger-pro-updates/>

B. Practice

From earlier science classes, you no doubt already:

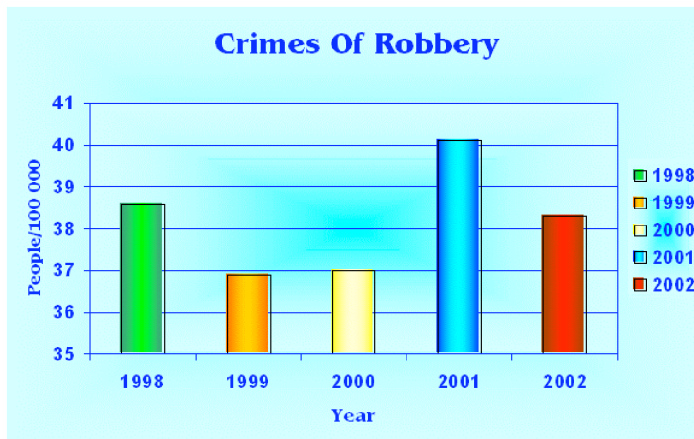
- Know how to convert raw data to frequency (percentage) results
- Can identify independent and dependent variables
- Use those variables to correctly set up tables and graphs
- Know when data is best expressed as a line graph, bar graph, or pie chart

Most graphs contain 5 parts:

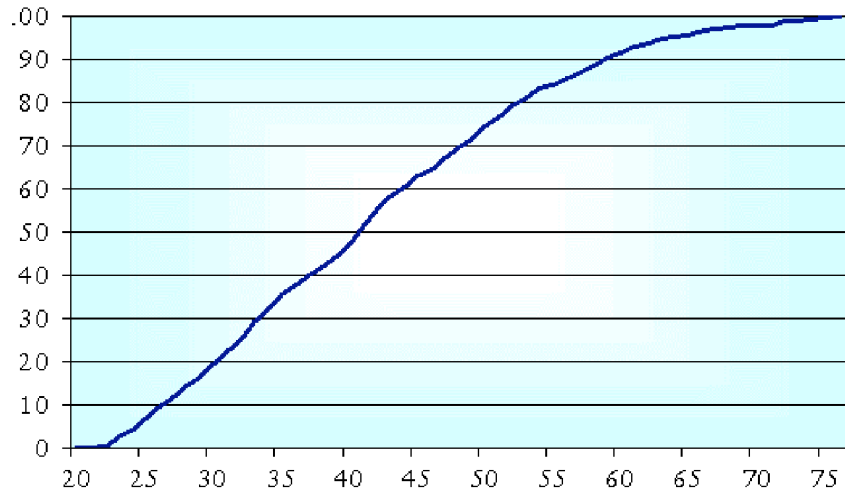
- Title
- Independent variable (x-axis)
- Dependent variable (y-axis)
- Scale for each variable
- Legend or key

The following graph is a fair to good example of a graph. In the chart below, list what has been done well and what needs to be fixed:

Good	Bad



The graph below is a bad graph. What parts are missing?



When is it appropriate to use the following types of graphs?

- Line Graph
- Bar Graph
- Pie Chart

Ready? Let's Graph!

Experiment 1:

Use the following data to create an appropriate graph, and answer the questions. Use Logger Pro for your graph; print and attach to this packet. Practice creating graphs by typing the data below into Logger Pro and making different graphs.

Depth (meters)	Bubbles/minute PLANT A	Bubbles/minute PLANT B
2	29	21
5	36	27
10	45	40
16	32	50
25	20	34
30	10	20

Q1. What is the dependent variable? Why did you pick this answer?

- Q2. What is the independent variable? Why did you pick this answer?
- Q3. What type of graph would be best for this data? Why did you pick this answer?
- Q4. What title would you give this graph?
- Q5. What information would you include in the legend of your graph?
- Q6. What label will you use for the X-axis?
- Q7. What label will you use for the Y-axis?

Experiment 2:

Use the following data to create an appropriate graph, and answer the questions.

Diabetes is a disease affecting insulin producing glands of the pancreas. If there is not enough insulin being produced by these cells, the amount of glucose in the blood will remain high. A blood glucose level above 140 for an extended period of time is not normal. This disease, if not brought under control, can lead to complications and even death.

Time after eating (hours)	Glucose (mg/dL) PERSON A	Glucose (mg/dL) PERSON B
0.5	170	180
1	155	195
1.5	140	230
2	135	245
2.5	140	235
3	135	225
4	130	220

Q10. Which person would you potentially diagnose as a diabetic?

Q11. What evidence do you have to support your answer?

Q12. What if the time period was extended to 6 hours and the patient did not eat again? What would be the expected blood glucose level for Person A?

Person B?

Conclusions are summaries of the effect of the independent variable upon the dependent variable.

Q13. What conclusion can you make about the data and graph for Experiment 1?

Q14. What evidence did you use to support your conclusion (use data in your justification)?

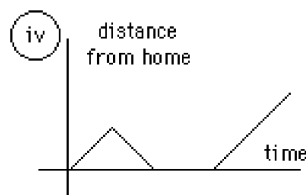
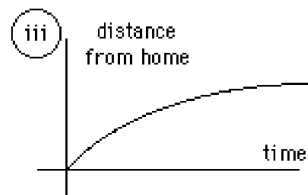
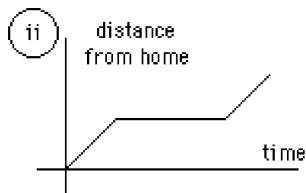
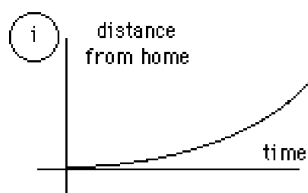
Q15. What conclusions can you make about the data and graph for Experiment 2?

Q16. What evidence did you use to support your conclusion?

Q17. What other type of graph could you have created for Experiment 1? For Experiment 2?

C. Interpreting Graphs

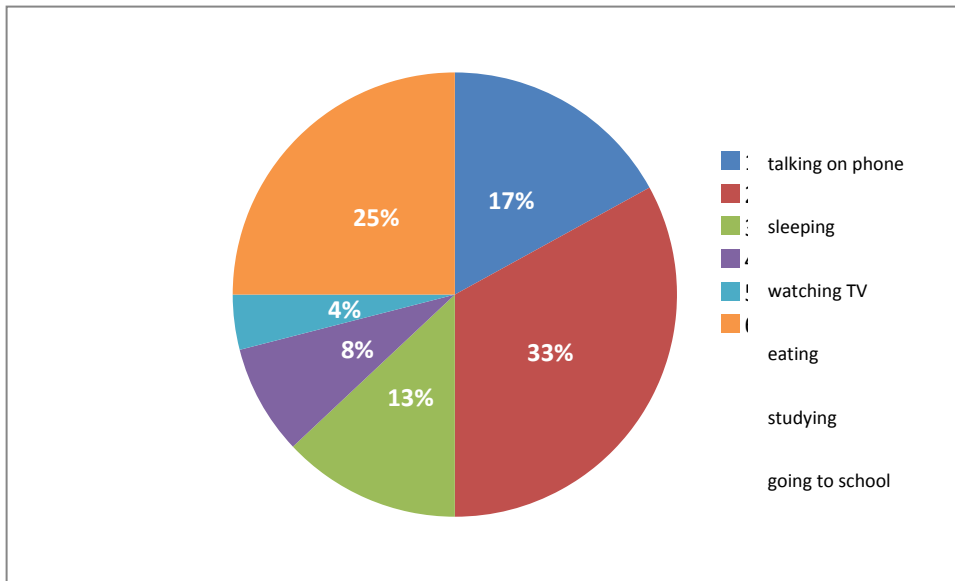
In addition to being able to draw graphs based on data collected, you will also need to interpret data given to you in graph form. Answer the following questions based on the graphs presented. NOTE: Most of these are NOT examples of great graphs; they are for interpretation practice only.



Identify the graph that matches each of the following scenarios:

1. I had just left home when I realized I had forgotten my books, so I went back to pick them up.
2. Things went fine until I realized that I had a flat tire.
3. I started out calmly, but sped up when I realized I was going to be late.

The graph below represents the typical day of a teenager. Answer these questions:



Answer these questions about the graph on the right:

4. What percent of the day is spent watching TV?

5. How many hours are spent sleeping?

6. What activity takes up the least amount of time?

7. What activity takes up a quarter of the day?

8. What two activities take up 50% of the day?

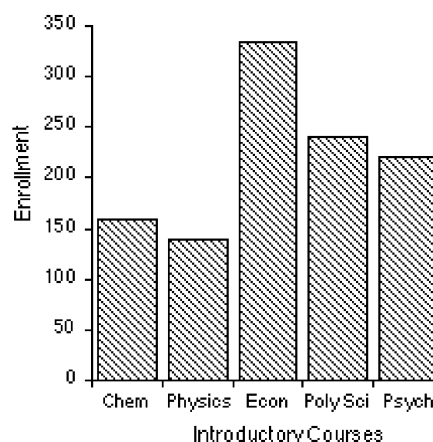
9. What two activities take up 25% of the day?

0 5 10 15 20 25

Hours

10. How many total miles did the car travel?

The bar graph at the right represents the declared majors of freshmen enrolling at the university. Answer the following questions:



14. What is the total freshmen enrollment of the college?

II. Review Basic Chemistry

Chemistry is the foundation for understanding research these days is molecular.

Use academic resources and create notes on

A. Atoms, and How They Form Bonds

- Atom vs. Molecule
- Valence vs. Oxidation number
- Covalent vs. Ionic Bonds
- Atom vs. Ion vs. Isotope
- Carbon!

B. The Nature of Water Molecules

- Electronegativity
- Polar Covalent vs. Non-polar Covalent
- Hydrogen Bonding
- Hydrophilic vs. Hydrophobic Molecules
- Cohesion, Adhesion, and Surface Tension

C. Solutions

- Solute vs. Solvent
- Acid vs. Base
- H^+ vs. OH^-

15. What percent of the students are majoring in physics?
16. How many students are majoring in economics?
17. How many more students major in political science vs. psychology?