Part 1: METRIC BACKGROUND REVIEW

NAME_____HR__

[15min]

⌦Measuring Length

1-What does each unit represent?

a. mm =_____ b. m=_____ c. cm= _____ d. km= _____

2-Convert the following:

a. 1 m= _____ cm b. 1 cm= _____mm c. 1 km= _____m

➲Remember… If you go from Bigger → Smaller, move the decimal to the RIGHT.
If you go from Bigger ← Smaller (smaller to bigger), move the decimal to the LEFT.

Kilo Hecta Deca <u>UNIT-(meter, gram, liter)</u> Deci Centi Milli

➲Each of the units above counts as one decimal point. For example, if you are converting 3,000 mm to meters (the unit), you are going from smaller to bigger, so you will move the decimal to the left 3 spots. 3,000 mm = 3m.

3-Which measurement is larger? (Circle one)

a. 14 mm or 1cm
b. 334 m or 1 km
c. 1 m or 990 cm
d. 145 m or 145 km
e. 3.4 cm or 30 mm
f. 10 km or 1000 cm

➲HINT: If it says "nearest", you need <u>to round</u> your answer so you do not have a decimal point.

4-Use a metric ruler to find each measurement

a. Length of the line in centimeters: _____

b. Length of the line to the <u>nearest</u> cm: _____

c. Height of the rectangle to the <u>nearest</u> millimeter: _____

d. Width of rectangle to <u>nearest</u> mm: _____

5-Find the length of an unsharpened pencil (including eraser) in mm: _____

6 -<u>Circle the BEST</u> metric unit to measure each of the following:

a. The length of an eyelash:	mm	cm	m	km
b. The height of a flagpole:	mm	cm	m	km
c. The length of a strand of spaghetti:	mm	cm	m	km
d. The distance from Olathe to Lawrence:	mm	cm	m	km

⌦Measuring Volume

7- What does each unit represent?

a. mL = _____ b. L= _____

8- Convert the following:

a. 1 mL= _____ L b. 1,500 mL= _____ L c. 2.4 L = _____ mL

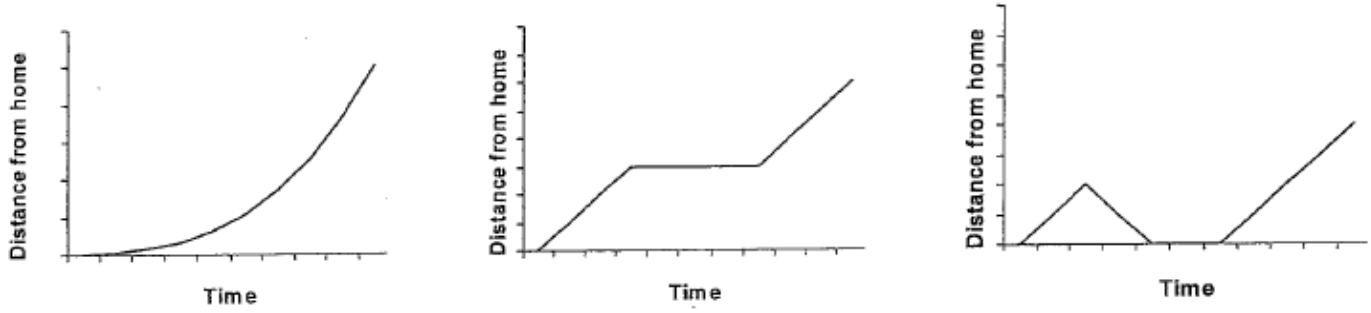
9- What types of instruments can we measure volume with? _____

10- What is a meniscus? _____ DRAW an example

How do you read it? _____

Part 2: INTERPRETING/ANALYZING Graphs and Data NAME_____HR__

⌦Graph 1: Identify the graph that matches each of the following stories. Place the LETTER on the line below each graph [20min]



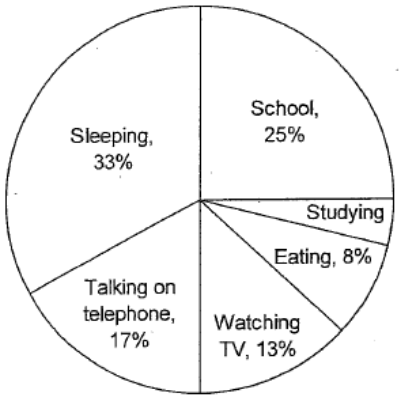
_____ _____ _____

A- I had just left home when I realized I had forgotten my books so I went back to pick them up. Then I realized I went to school.

B- Things went fine until I had a flat tire. I put on my spare tire and continued to school.

C- I started out calmly, but sped up when I realized I was going to be late.

⌦Graph 2: The graph below represents the typical day of a teenager. Answer the following questions.



A-What percent of the day is spent studying? _____%

B-How many hours are spent sleeping? _____hrs

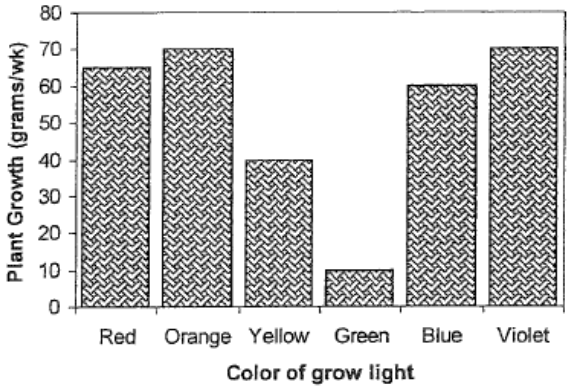
C-What activity takes up the least amount of time? _____

D-What activity takes up a quarter of the day? _____

E-What two activities take up 50% of the day? _____&_____

F-What two activities take up 25% of the day? _____&_____

⌦Graph 3: Answer the following questions using the graph below.



A- Identify the dependent variable on this graph:

B- What two colors of light create the highest plant growth?

C- What is the plant growth in green light?

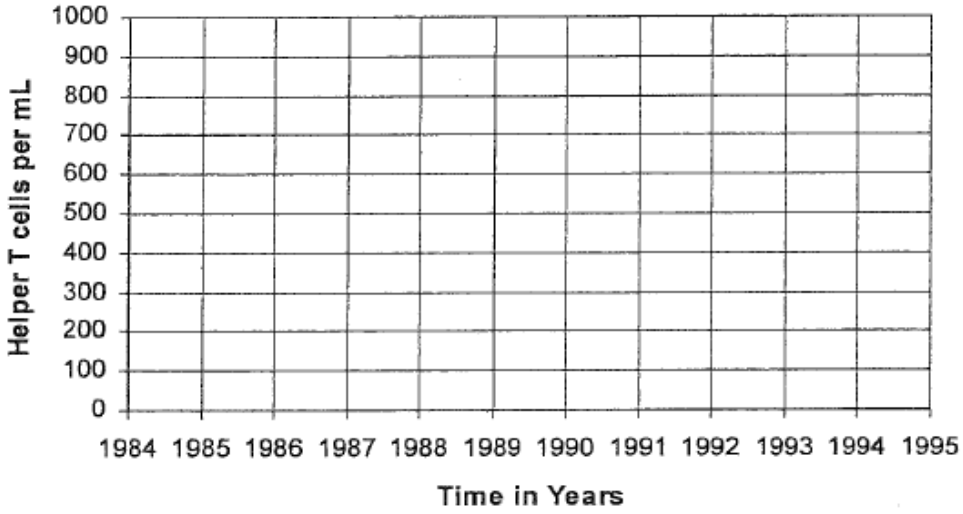
⌦Graph 4: CONSTRUCT

- Use the data in the following table/paragraph to make an *appropriate type of graph*

-The graph illustrates the depletion of helper T cells during the progression of an HIV infection.

-LABEL the X & Y axis and INCLUDE a title.

Year of T-cell count	T_H cells per mL
1985	980
1986	940
1987	860
1988	700
1989	480
1990	340
1991	260
1992	180
1993	160
1994	120

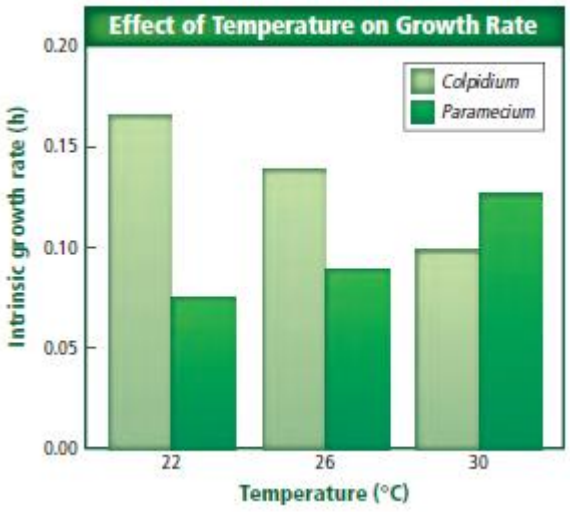


⌦Graph 5: DATA ANALYSIS

Based on Real Data

ANALYZE the DATA: Does temperature affect growth rates of protozoans? Researchers studied the effect of temperature on the growth rated of protozoans. They hypothesized that increasing temperature would increase the growth rate of the protozoans.

-The graph shows the effect of temperature on the growth rate of Colpidium and Paramecium.



1-DESCRIBE the differences in population growth for the two species.

Colpidium

-_____

Paramecium

-_____

2-EVALUATE: What could be the next step in the researcher's investigation?

-_____

Part 3: SCIENTIFIC METHOD REVIEW

NAME_____HR__

[15min]

☒ **multiple choice:** Please identify the choice that best completes the statement or answers the question.

1. A condition that can change or differ during an experiment is called a(n)
   a. unknown
   b. control
   c. observation
   d. variable

2. Measurements of a plant's growth over a two-week period represent
   a. inferences
   b. data
   c. variables
   d. hypotheses

3. In science, a hypothesis is useful only if
   a. it is proven correct
   b. the explanation is already known
   c. it can be proven incorrect
   d. it can be tested

4. Which of the following might be a valid hypothesis for why a plant appears to be dying?
   a. The plant is not being watered enough
   b. The plant is being watered too much
   c. The plant is receiving too much sunlight
   d. all of the above

5. You suggest that the presence of water could accelerate the growth of bread mold. This is a(an)
   a. conclusion
   b. experiment
   c. hypothesis
   d. analysis

6. A controlled experiment allows the scientist to isolate and test
   a. a conclusion
   b. several variable
   c. a mass of information
   d. a single variable

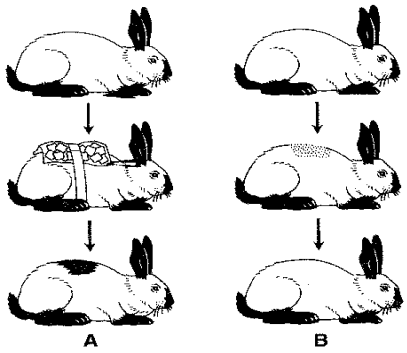
7. Which of the following is an example of data that could be collected?
   a. You record the air temperature every day for a week.
   b. You propose that a cold front is approaching.
   c. You hypothesize that the temperature will increase tomorrow.
   d. You conclude that the season is changing.

8. Tasha is testing the effect of blue-colored light on the growth of tomato plans. Which is the independent variable in this experiment?
   a. light color
   b. light intensity
   c. amount of light
   d. temperature of light

9. A researcher is interested in the effects of nitrate and phosphate on plant growth. He sets up an experiment in which groups of five plants are given 1, 2, and 3 grams of nitrate and 1, 2, and 3 grams of phosphate in all combinations over a period of one month. He makes sure that all the plants receive the same amount of water and sunlight. The researcher measures plant height and weight at the end of the experiment. What is missing in this experiment design?
   a. a control
   b. an independent variable
   c. a dependent variable
   d. a constant

10. Which of the following correctly sequences the steps of the scientific method?
    a. Hypothesis; Experiment; Theory; Problem/Question; Observations; Conclusion
    b. Theory; Hypothesis; Experiment; Observations; Problem/Question; Conclusion
    c. Observations; Problem/Question; Hypothesis; Experiment; Conclusion; Theory
    d. Theory; Problem/Question; Hypothesis; Experiment; Observations; Conclusion

⌦**short answer**: use the information in the figure below to answer the questions.
-A scientist conducted an experiment to determine the effect of environment on the color of fur of a Himalayan rabbit.
-The Himalayan rabbit typically has a white coat except for its colder nose, feet, tail, and ears, which are black.
-The scientist shaved an area of hair on the back of each rabbit, then placed an ice pack over the shaved area on one rabbit (A).



11- IDENTIFY which rabbit is the control?

12- IDENTIFY the independent variable in this experiment?

13- IDENTIFY the dependent variable in this experiment?

14- DEVELOP a HYPOTHESIS: Before completing the experiment, the scientist made a hypothesis.
- What is the hypothesis she is testing? (IF…THEN…)

15- EXPLAIN why Rabbit B essential to the experiment?

16- IDENTIFY- Are the observations in the experiment quantitative or qualitative data?

17- ANALYZE- Based on your observations, conclude what effect temperature has on Himalayan rabbits.

⌦**scientific method scenerio**
Read the passage below then answer the questions using information within the passage

A horticulturist (plant scientist) complains to the city that a nearby residence is ruining his flowers because of the detergent being used to wash their cars. The soap runs into a stream that goes near his flower beds. As an inquiring scientist, you want to find out whether soap can affect flower growth. Design an experiment to determine the effect of the soapy water on the growth of plants.

18-IDENTIFY the independent variable in this experiment?
a. dirty cars
b. soap in water
c. flower color
d. flower growth

19-IDENTIFY the control group?
a. plants with soapy water
b. plants without soap in water

Part 4: ACT PRACTICE

NAME_____HR__

[15min]

➲This is a research summary type set of questions. This means that there is a description of two to five experiments provide and you will be asked to determine what the experiments mean and conclusion that can be drawn from them.

The clearing of rain forests results in *forest fragmentation* (the breakup of large forest tracts into small patches). Researchers predicted that fragmentation would result in a decrease in animal populations and *above ground tree biomass* (AGTB) in the resulting fragments. Four studies were completed to test this prediction.

⌦Study 1

The researchers monitored the AGTB of twenty-five 100m x 100m forest plots near areas that had recently been cleared of vegetation. The distance from the center of each plot to the nearest clearing was measured. Figure 1 shows the average change per plot in AGTB in metric tons per year (t/yr) over 17 yr.

⌦Study 2

Twenty-five 100m x 100m forest plots were monitored as in Study 1. The center of each of these plots was at least 500m from the nearest clearing. The average change in AGTB over 17 yr for these 25 plots was 0 t/yr.

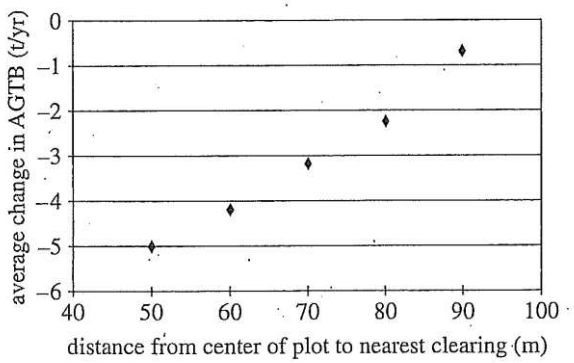


Figure 1

⌦Study 3

Researchers monitored sixteen 100m x 100m forest plots near areas that had recently been cleared of vegetation. Each plot was bordered on 1 side by a clearing. Figure 2 shows the average cumulative percent change in AGTB at these plots following fragmentation. (Note: Year 0 represents results prior to fragmentation).

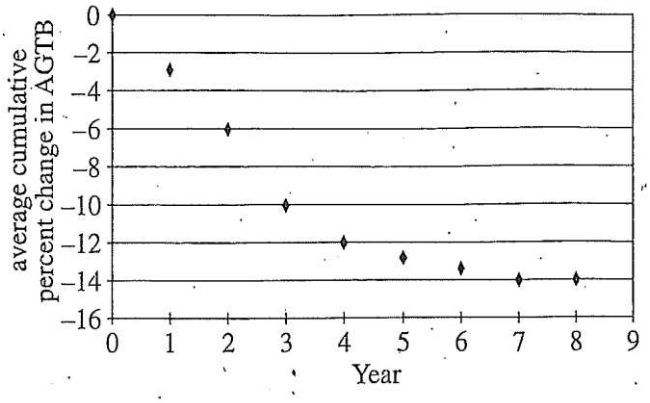


Figure 2

⌦Study 4

Researchers trapped and released birds in 10 forest fragments adjacent to areas that had recently been cleared of vegetation. Three types of birds were monitored: insectivores, frugivores (fruit eaters), and hummingbirds. Figure 3 shows the number of captures per 1,000 hours (hr) of trapping.
(Note: Year 0 represent results prior to fragmentation.)

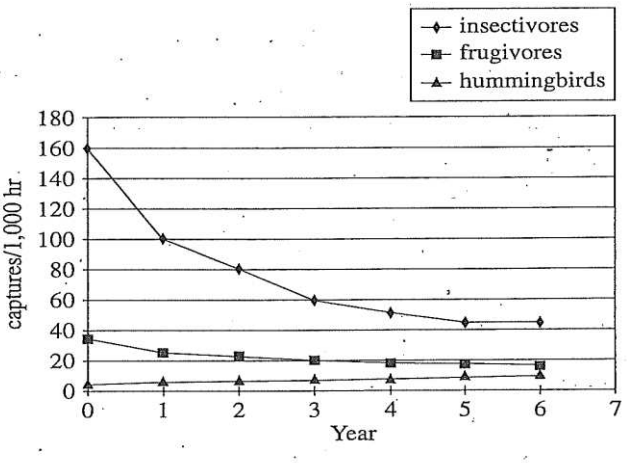


Figure 3

➲CIRCLE the letter the BEST answers the question.

1. In study 4, as time increased from Year 0 to Year 6, the captures/1,000 hr of frugivores:
    a. Decreased only.
    b. Increased only.
    c. Decreased, then increased.
    d. Increased, then decreased.

2. Based on the results of Study 4, how did fragmentation most likely affect the population sixes of insectivores and hummingbirds in the fragments studied?
    a. Fragmentation increased the population sizes of both insectivores and hummingbirds.
    b. Fragmentation decreased the population sizes of both insectivores and hummingbirds.
    c. Fragmentation increased the population size of insectivores and decreased the population size of hummingbirds.
    d. Fragmentation decreased the population size of insectivores and increased the population size of hummingbirds.

3. Based on the results of Study 1, if the distance from the center of a 100m x 100m plot were 75m from the nearest clearing, the expected average change in AGTB at the plot over 17yr would be closest to which of the following values?
    a. -1.1 t/yr
    b. -2.6 t/yr
    c. +1.1 t/yr
    d. +2.6 t/yr

4. After examining the results of Study 2, a student concluded that the AGTB at each of the 25 plots remained constant. Which of the following alternative explanations is also consistent with the results?
    a. The AGTB at all 25 plots increased.
    b. The AGTB at all 25 plots decreased.
    c. The AGTB at some of the plots increased and the AGTB at some of the plots decreased.
    d. The AGTB at plots bounded by forest increased and the AGTB at plots bounded by clearings remained constant.

5. Which of the following sets of results from the studies is *least* consistent with the prediction proposed by the researchers?
    a. The results of Study 1 for AGTB.
    b. The results for Study 3 for AGTB.
    c. The results of Study 4 for frugivores.
    d. The results of Study 4 for hummingbirds.

6. In Study 4, the researchers trapped birds for 10,000hr per year. Thurs, how many insectivores were trapped in Year 2?
    a. 80
    b. 100
    c. 800
    d. 1,000

* Modeled after a release and published ACT practice test.

Part 5: POGIL

NAME_____HR__

[30min]

⌦WHAT IS POGIL?

POGIL is an acronym for Process Oriented Guided Inquiry Learning.

POGIL uses guided inquiry – a learning cycle of exploration, concept invention and application – as the basis for many of the carefully designed materials that students use to guide them to construct new knowledge.

POGIL is a student-centered strategy; students work in small groups with individual roles to ensure that all students are fully engaged in the learning process.

POGIL activities focus on core concepts and encourage a deep understanding of the course material while developing higher-order thinking skills.

POGIL develops process skills such as critical thinking, problem solving, and communication through cooperation and reflection, helping students become lifelong learners and preparing them to be more competitive in a global market.

⌦POGIL PROCESS SKILLS

-Explicit emphasis on the development of process skills as an important component of the student learning process.
-The process skills include both cognitive and affective processes that students use to acquire, interpret, and apply knowledge.

ORAL AND WRITTEN COMMUNICATION
-exchanging information and understanding through speaking, listening, and non-verbal behaviors
-conveying information and understanding to an intended audience through written materials

TEAMWORK
-interacting with others and building on each other's individual strengths and skills, working towards a common goal

PROBLEM SOLVING
-Identifying, planning, and executing a strategy that goes beyond routine actions to find a solution to a question/problem

CRITICAL THINKING
-analyzing, evaluating, synthesizing relevant information to form an argument or reach a conclusion supported with evidence

MANAGEMENT
-planning, organizing, directing, and coordinating one's own and others' efforts to accomplish a goal

INFORMATION PROCESSING
-evaluating, interpreting, manipulating, or transforming information

ASSESSMENT
-gathering information and reflecting on experiences to improve learning and performance
-thinking/reflecting about one's thinking and how one learns, being aware of one's knowledge

⌦POGIL ROLES [assigned during collaborative work time on a rotating basis]

1-FACILITATOR / TIMEKEEPER

-keep group ON TASK / FOCUSED-takes care of TIME MANAGEMENT

-makes sure ALL VOICES in group are HEARD

2-SPOKESPERSON

-COMMUNICATES group QUESTIONS/CLARIFICATIONS w/ INSTRUCTOR

-ENSURES ALL MEMBERS have had the OPPORTUNITY to RESPOND before asking questions

-ENSURES that EVERYONE in group AGREES on WHAT QUESTION to ask

-PRESENTS CONCLUSIONS of the group to the class, as requested

3-SCRIBE

-TEAM NOTE-TAKER / TEAM "GRADER"

-LEADS team in REVISIONS

4-QUALITY CONTROL / CHECKER

-GUIDES consensus-building process: group must AGREE on RESPONSES

-VERIFIES that ALL individual responses are CONSISTANT

-ENSURES that ACCURATE REVISIONS happen during/after class discussions

⌧➲POGIL SKILLS in ACTION

➔OBJECTIVE:

-IDENTIFY the importance of interpersonal skills and appropriate behavior during collaborative work situations.

-OBSERVE videos designed as instructional tools to help better understand the importance of effective interpersonal skills in a collaborative setting.

➔DIRECTIONS

-OBSERVE video links on class website [only complete the videos assigned on the website- we will finish the others in class]

-IDENTIFY each clip as ☐-positive or ☐-negative

-PROVIDE required feedback on each video clip.

-**NEGATIVE INTERACTIONS**

-SUGGEST a way to correct the negative behavior displayed if this occurred in your group.

-**POSITIVE INTERACTIONS**

-IDENTIFY the behavior that made this a positive example

DEFINE: interpersonal skills

-_____

➲COMMUNICATING CLEARLY

#1- ☐-positive ☐-negative

☑-_____

#3- ☐-positive ☐-negative

☑-_____

#4- ☐-positive ☐-negative

☑-_____

➲LISTENING SKILLS

#11- ☐-positive ☐-negative

☑-_____

#12- ☐-positive ☐-negative

☑-_____

#13- ☐-positive ☐-negative

☑-_____

➲COURTEOUS INTERACTIONS

#16- ☐-positive ☐-negative

☑-_____

#17- ☐-positive ☐-negative

☑-_____

#18- ☐-positive ☐-negative

☑-_____

➲TAKING RESPONSIBILITY

#25- ☐-positive ☐-negative

☑-_____

#26- ☐-positive ☐-negative

☑-_____

#27- ☐-positive ☐-negative

☑-_____

➲ACCEPTING FEEDBACK

#29- ☐-positive ☐-negative

☑-_____

#31- ☐-positive ☐-negative

☑-_____

32- ☐-positive ☐-negative

☑-_____

➲DEALING WITH CONFLICT

#35- ☐-positive ☐-negative

☑-_____

#36- ☐-positive ☐-negative

☑-_____

#39- ☐-positive ☐-negative

☑-_____

Part 6: CORNELL NOTES

NAME_____HR__

[120min]

➲Students will complete a FLIPPED lesson by taking Cornell notes on a reading assignment or assigned video lesson.

1-View the video on Cornell Notes [ENTER FULL NAME]

2-Review the steps of taking/using Cornell Notes.

3-Practice taking Cornell Notes for chapter 1-Science of Life [1.1 /1.2 /1.3].

-Use the provided templates

-Each section should be limited to 1 page of Cornell Notes- this will require you to summarize the information.

1-VIDEO: intro to Cornell Notes

-see link on website

-VIEW the VIDEO [ENTER FULL NAME] / COMPLETE the questions and SUBMIT.

2-TAKING/USING CORNELL NOTES [step 1-8]

1. **Creating the Format**
   - **-When:** Before lecture/reading begins
   - **-What you do:** Heading, essential question, line breaking off a 2.5" left column
2. **ORGANIZING THE NOTES**
   - **-When:** During the lecture/reading
   - **-What you do:** Record information, leave space, abbreviate, bullet/number, change pen color, indent
3. **Review and Revise**
   - **-When:** 10-20 minutes after the end of a lecture/reading
   - **-What you do:** Underline main ideas, cross out unnecessary information, highlight, and use symbols (?, *, !)
4. **Note Key Ideas**
   - **-When:** 15 minutes to 24 hours after the end of the lecture/reading
   - **-What you do:** Chunk sections of related information, generate questions for the various chunks
5. **Exchange Ideas**
   - **-When:** After 15 minutes, this is an ongoing process
   - **-What you do:** Examine other students' notes and fill in information, fill in info from textbooks, record understanding that you gain from reviewing
6. **Link Learning**
   - **-When:** Within 24 hours
   - **-What you do:** Use the essential question and questions that you've generated to create a summarization of the material
7. **Learning Tool**
   - **-When:** After 24 hours, after 7 days, after 30 days, review
   - **-What you do:** Cover the right side and rework (answer) the left-hand questions, look over notes on the right side and identify other areas of confusion
8. **Reflect on Note-Taking**
   - **-When:** Right before a test or directly following a test
   - **-What you do:** Before the test, look at all of your notes from the unit, identify unanswered questions, and continue predicting possible test questions. After the test, look back at your notes and compare what you missed and where the information was (or should have been) in your notes; look at the gaps in your note-taking

3-PRACTICE TAKING CORNELL NOTES [1.2 /1.2 /1.3]

-You will **complete STEP 2** of the Cornell Note process **only**. We will work through steps 3-8 in class.

-Use the provided Cornell Note paper for each section. [the format has been created for you]

-COMPLETE the ESSENTIAL QUESTION and RIGHT SIDED NOTES

-Follow the directions for MARKING the TEXT.

➲class website has resources / support

Book pages and Cornell Note templates have been provided.