

WJCC School Closure Learning Plan - Biology

Dear WJCC Families,

We are facing significant challenges throughout our nation due to the COVID-19 pandemic. As a result, WJCC Schools will be closed for the remainder of the academic year per the direction of Governor Northam. The Virginia Department of Education will provide guidance on continued teaching and learning over the next few days.

Throughout this time, we will continue to provide resources and activities to support learning. The resources in this packet will help your child practice important skills and review content. This supplemental packet should support learning activities from March 30th – April 3rd. Additional resources may be posted on Student VUE for certain subjects. Students are encouraged to check Student VUE during this time.

This work is not required, and it will not be graded. We simply want families to have access to materials and options during our mandated school closure.

We will be in touch soon with our direction for the remainder of the school year. We hope everyone remains safe and healthy.

Sincerely,
WJCC Staff

Biology Extended Learning - Complete the learning activities below which review material covered in your course.

Activity 1	Activity 2	Activity 3	Activity 4	Activity 5
Scientific Method – Identify the parts of the scientific method in the situations presented.	Is it Alive? – Complete an investigation to determine characteristics of life.	Cell Reproduction Concept Map – Use the provided terms and phrases to complete graphic organizer.	Cell Theme Park – Draw a blue print for an amusement park with a cell theme.	Scenario Snips – Identify scientific investigation components in different scenarios.
Online Activity 1 (optional) Complete online Jefferson Lab Assessments. http://education.jlab.org/solquiz/		Online Activity 2 (optional) Review Digital Flash Cards on Quizlet to prepare for SOL key terms quizlet.com/_15x3a	Online Activity 3 (optional) Complete any Explore Learning Gizmo Labs to review Scientific Investigation www.explorelearning.com	

ACTIVITY 1: Scientific Method

In the following situation, identify the hypothesis, independent variable, dependent variable, the control and constants.

After studying about recycling, members of John's biology class investigated the effect of various recycled products on plant growth. John's lab group compared the effect of different aged grass compost on bean plants. Because decomposition is necessary to release the nutrients, the group hypothesized that older grass compost would produce taller bean plants. Three flats of bean plants (25 plants/ flat) were grown for 5 days. The plants were fertilized as follows: (a) Flat A: 450 g of three-month-old compost, (b) Flat B: 450 g of six-month-old compost, and (c) Flat C: 0 g compost. The plants received the same amount of sunlight and water each day. At the end of the 30 days the group recorded the height of the plants (cm).

Hypothesis: _____

IV: _____

DV: _____

control: _____

constants: _____

In the following situations, identify the hypothesis, independent variable, dependent variable, the control and experimental group.

1. The addition of the chemical calcium chloride (CaCl) to water will increase its temperature.

Hypothesis: If _____, then _____.

Independent Variable: _____ Dependent Variable: _____

Control Group: _____ Experimental Group: _____

2. Watering a plant with salt water will kill the plant.

Hypothesis: If _____, then _____.

Independent Variable: _____ Dependent Variable: _____

Control Group: _____ Experimental Group: _____

3. A person that takes a vitamin supplement has better memory retention.

Hypothesis: If _____, then _____.

Independent Variable: _____ Dependent Variable: _____

Control Group: _____ Experimental Group: _____

ACTIVITY 2: Is it alive?

All organisms on Earth share certain characteristics, but an actual definition of life is not simple. Why? The categories of living and nonliving are constructed by humans, and they are not perfect. In this activity you will collect five objects from outside and then identify whether or not the object is living or nonliving based on what we have learned in class.

Hypothesis: _____

Procedure:

1. How do you know if the object is alive or not? Write this as your hypothesis.
2. Go outside and collect five objects.
3. Complete the Data Table with the following information:
 - a. You need at least three observations for each object. The observations need to be quantitative and qualitative. You may use a ruler to obtain quantitative observations.
 - b. For the name, write what you think the object is called.
 - c. The next four items deal with the characteristics of living things. If your object has any of the four characteristics, put a mark in the box.
 - C= made up of cells
 - M = metabolism (uses energy)
 - R to E = responds to the environment
 - R & D = reproduction and development (made up of DNA!)
 - d. The last thing you need to decide is what category does it belong to
 - L = living
 - OL = once living
 - M = made by a living thing
 - NL = never living

Data Table:

Object Number	Observations	Name?	C	M	R to E	R & D	Category
1							
2							
3							
4							
5							

When you write your conclusion consider the following questions:

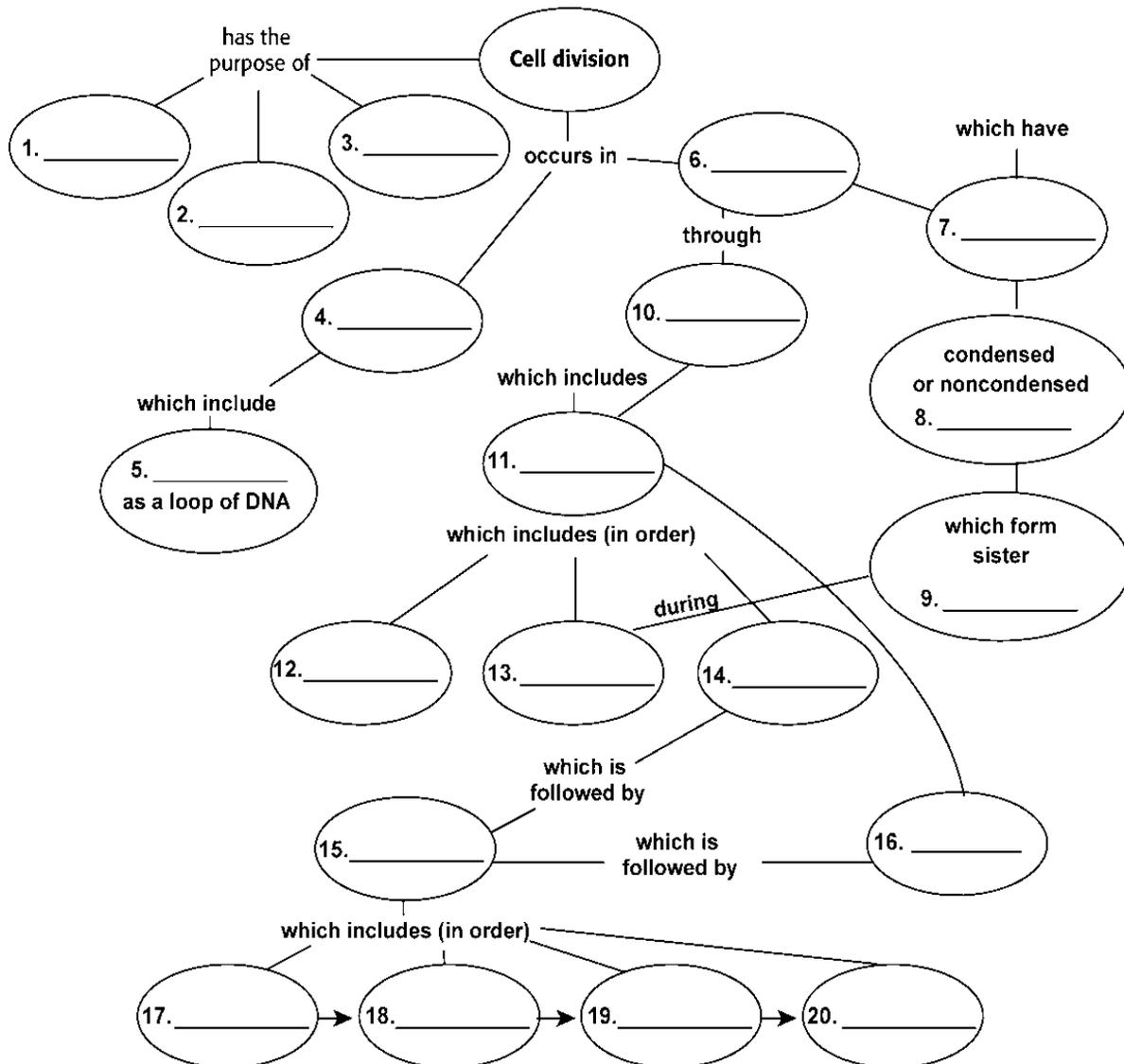
- Which characteristic(s) were difficult to determine or observe?
- What objects went into the different categories?
- Did you have any categories that were empty?
- Which characteristics do you feel best define life?

Conclusion:

ACTIVITY 3: Cell Reproduction Concept Map

Using the terms and phrases provided below, complete the concept map showing the principles of cell division.

- | | | |
|----------------|----------------------|--------------|
| anaphase | G ₁ phase | prokaryotes |
| the cell cycle | G ₂ phase | prophase |
| chromatids | growth | replacement |
| a chromosome | interphase | S phase |
| chromosomes | metaphase | telophase |
| cytokinesis | mitosis | wound repair |
| eukaryotes | nucleosomes | |



ACTIVITY 4: Cell Theme Park

Your favorite destination to travel with friends and family may be Busch Gardens, Kings Dominion or maybe even Universal Studios! Have you ever considered becoming a future architect or an engineer to design your own theme park? You never know, one day this could become your dream come true!

Your task is to use a blank sheet of paper to design a model of a theme park based on the structure of a typical plant or a typical animal cell. The rides in the park must be based on the cell organelles and their functions. The boundaries of the park must be based on the structure and function of cell membrane.

Required elements for your Theme Park:

- Give a unique name for your Theme Park.
- Get creative in designing and representing the rides based on cell organelles and their functions
 - Include the following cell structures: Cell wall (if you choose to represent a plant cell), Cell membrane, Nucleus, Cytoplasm, Golgi Apparatus, Ribosomes, Endoplasmic Reticulum (rough and smooth) Mitochondria, Vacuoles, Lysosomes, Chloroplasts
- Find creative ways to include active and passive transport at the entrance of the Park
- Make a chart/Key on the side to show the name of the rides and the organelles it represents.

Because you are an architect and an engineer this can be your "blue-print" or rough draft of what your theme park would look like! Take a picture and share your creation/drawing with your teacher and classmates!

ACTIVITY 5: Scenario Snips

Read the following scenarios provided. After reading the situation, decide what the students need to do.

- 1) Sierra loves to listen to the radio all day long. She notices that her CD player runs out of batteries very quickly. She decides that she needs to make a change. What sort of experiment could she conduct to save herself some money?
 - a. Materials- What sort of materials does she need?
 - b. Procedure- What procedure should she follow?
 - c. Data- What sort of data could she collect? Give an example.

- 2) Michael works all day long. He goes to school for the whole day, then has practice with his team and then works at night. He has trouble staying awake all day! He reads an article that explains the impact of diet on an individual's energy load. What sort of experiment could he conduct to improve his energy levels?
 - a. Hypothesis- What sorts of foods might he predict that would increase his energy levels?
 - b. Purpose- Why is he doing this?
 - c. Procedure- What procedure should he follow?
 - d. Data- What sort of data could he collect? Give an example.