Oakland CUSD #5

Biology

April 20-24, 2020

Debra Welch

Week of April 20-24, 2020
High School Science
Debra Welch

Hello students! I hope all of you are staying healthy. I just want everyone to know that I am thinking you and miss having school as normal. Remember to keep your immune systems strong! Basic directions are: You need to complete one lesson a week for only the class you were currently enrolled in and choose from the 3 choices. Choices 1 & 2 are for review of material we have already covered this year. I will start at the beginning and go through the year's material. Choice #3 will always be new work using your textbook or other handouts I include. I will make every effort to keep your work simple to do, considering that we are not learning together in the classroom. Your work should be turned in as a hard (paper) copy to the office or through email in a word or google document. My email is: debra.welch@oakland5.org. Please be sure all work has your name! If you have not turned in the assignment by the following Monday, I will need to email your parents and/or place a phone call home. Please be diligent to turn work in on time. I suggest you set up a schedule just as if you were at school and allow for the normal time period. Most assignments I send you will take less time than our normal 40 minutes. Comments will be made on paper copies and returned to you. If you send in homework answers as an email I will reply to your email and give my comments/reflections of your work. I will be supplying you with the necessary notes or you will need to use your book to find the answers. If you have any questions feel free to email me and I will get back to you by email during my office hours. If you can't email feel free to call the office and leave me a message. Good Luck and stay healthy!

Anatomy: for those of you who wanted to continue learning throughout the body systems I will be including notes and sending you powerpoints to use with Choice #3. If you plan to go into a medical field I advise you to go ahead and complete the Enrichment on the body systems we could not study due to school closure.

Lesson Choices on next page:

Class	Choice 1	Choice 2	Choice 3 (Enrichment)
Biology	**Worksheet p1** Biology the Science of Life, questions 1-20 Use text & notes I provided to you last week on the "Nature of Life"	Biology for Everyday: Characteristics of Living Things p1: Fill out both columns on the chart: a definition and example. (There are 12 & #1 is done for you).	READ the powerpoint notes on Viruses & do the SG 18-2 p16. Then do colorsheet p32 Viral Replication. (Do both).
Anatomy	Re:view Body Cavities Labeling worksheet. Look up using your text or notes and fill out the different body cavities on the worksheet. DO Back also Body Regions	Review: Body Systems Graphic Organizer Fill out the missing boxes on the sheet. These terms either describe a function or list a structure (organ). Refer to *word bank* at bottom of page!	New chapter: Blood **View Video- "Blood" by Khan Academy for "extra help". I am including the entire Act #1 on Blood. Start on pg3 and complete all of it. Do not do #15 on page 8. I have emailed to all students the powerpoint notes for this packet. *I am including packets like this for those who want to continue their education in the rest of the body systems we could not cover due to COV-19.*

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4/20-24

Name Date Class

CHAPTER 1 ASSESSMENT

BIOLOGY–THE SCIENCE OF LIFE

Understanding Concepts

Classify each organism as a producer (p), consumer (c), or decomposer (d) by writing the correct letter in the space at the left.

_____ 1. algae	_____ 5. garden snake	_____ 9. tiger
_____ 2. ant	_____ 6. goldfish	_____ 10. tree
_____ 3. bread mold	_____ 7. grass	
_____ 4. cow	_____ 8. mushroom	

In the space at the left, write the letter of the word or phrase that best completes the statement or answers the question.

_____ 11. Two products of cellular respiration are
- **a.** oxygen and glucose.
- **b.** oxygen and water.
- **c.** carbon dioxide and water.
- **d.** carbon dioxide and glucose.

_____ 12. Each of the following is a biologically-based solution to controlling the zebra mussel invasion *except*
- **a.** depriving them of oxygen.
- **b.** scraping them off surfaces.
- **c.** introducing one of their predators.
- **d.** preventing fertilization of their eggs.

_____ 13. In producers, chlorophyll and sunlight are necessary for the process of
- **a.** homeostasis.
- **b.** photosynthesis.
- **c.** cellular respiration.
- **d.** reproduction.

_____ 14. The closing of its shell when a clam is removed from its watery environment is an example of how the clam maintains its
a. growth. **b.** development. **c.** evolution. **d.** homeostasis.

_____ 15. In a food chain involving a mouse and the snake that eats it, the mouse and snake are
- **a.** both consumers.
- **b.** both producers.
- **c.** consumer and decomposer, respectively.
- **d.** producer and consumer, respectively.

Write the word or phrase that best completes the statement.

16. The supply of energy that producers need to make food comes from _____.

17. Physical traits that make an organism well suited to its environment are called _____.

18. The broadest division into which organisms may be classified is a(n) _____.

19. The increase in the amount of living material in an organism is referred to as _____.

20. The changes an organism undergoes in reaching its adult form is its _____.

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Name _____ Date 4/20-24

FRANK SCHAFFER'S BIOLOGY FOR EVERYDAY

Characteristics of Living Things

Living organisms have certain characteristics that place them apart from nonliving things. The most common of those characteristics are listed in Table A. Write a definition or description of each characteristic, then give an example of each characteristic. The first characteristic is done for you.

Table A

Characteristic	Definition or description	Example
1. REPRODUCTION	produce new organisms like themselves	cow giving birth to calf
2. NUTRITION		
3. RESPOND TO ENVIRONMENT		
4. CONSISTS OF CELLS		
5. RESPIRATION		
6. ADAPTATION		
7. INTAKE OF MATERIALS		
8. GROWTH		
9. MOVEMENT		
10. EXCRETION		
11. SYNTHESIS OR SECRETION		
12. REGULATION		

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In your textbook, read about retroviruses.

Use each of the terms below only once to complete the passage.

cancer-causing	**DNA**	**host cell**	**human immunodeficiency virus (HIV)**
nucleus	**retrovirus**	**reverse transcriptase**	**RNA**

Some disease-causing viruses have **(15)** _____ instead of DNA. This type of virus is called a **(16)** _____. The best-known virus of this type is **(17)** _____. Some **(18)** _____ viruses belong to this group. In the core of the virus is RNA and an enzyme called **(19)** _____, which is the enzyme that transcribes **(20)** _____ from viral RNA. Then DNA moves into the **(21)** _____ of a cell, and the **(22)** _____ manufactures and assembles new HIV particles.

In your textbook, read about viruses and prions.

Complete the table by checking the correct column(s) for each description.

Description	Viruses	Prions
23. Made of a protein		
24. Replicate in cells of organisms		
25. Made of a nonliving strand of genetic material		
26. Normally live in cells		
27. Cause infection and disease		
28. Cause proteins to mutate		
29. Attach to host cell and enter the cytoplasm		

If the statement is true, write true. *If the statement is false, replace the italicized term or phrase to make it true.*

30. Mutated prions are shaped like a *rod.*

_____

31. A disease in cattle associated with prions is *mad cow disease.*

_____

32. Abnormal prions cause nerve cells in the *heart* to burst.

_____

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32 VIRAL REPLICATION

READ

Viral replication requires a host cell in which the replication takes place. In the process, the host cell usually dies. In this respect, viral replication is one of the more remarkable phenomena of nature. In general, a virus invades a cell many times its own size and directs the metabolic machinery of the cell to produce copies of the virus. This operation has been studied in plant, animal, and human cells, but it has been most carefully documented in bacteria and the viruses that affect them. Such viruses are called bacteriophages (or simply, phages). In this plate, a bacterium and its phage are employed to explore viral replication.

Note the overall orientation of the plate; there are six stations from above to below. Color the subheading at station 1 (*1) gray and the related titles and structures (a) through (e) and (g) through (g^2). Use a light pastel color for (g) and darker shades of the same color for (g^1) and (g^2). Next color the subheading at station 2 (*2) and the titles and structures (f) and (h) and other structures in the related illustration. Read the corresponding text as you color the illustration at each of the two stations.

The phage (a; station 1) is characterized by a capsid (b) having the symmetry of an extended icosahedron. The capsid encloses a strand of DNA (f; station 2). The tail assembly includes a tail sheath (c) surrounding the central core (e) that accommodates the DNA. A pair of pins (d) and multiple fibers (d^1) constitute the lower part of the assembly.

The process of viral replication begins with the attachment of the phage to the bacterial cell wall (g; station 1: union phase). The phage attaches to receptor sites (g^1) of the bacterial wall with its fibers. The central core fits over the penetration site (g^2). In the penetration phase (station 2), enzymes from the tail end of the central core break down the bacterial wall. The tail sheath contracts and the core is driven through the bacterial wall. The DNA passes through the core and into the cytoplasm of the bacterium. The viral DNA migrates to the bacterial chromosome and uses the bacterial DNA (h) to synthesize viral DNA. The capsid stays outside the bacterium and disintegrates.

Color the subheadings at stations 3 through 6, in order, and associated titles and structures. Read the corresponding text with each phase you are coloring. The phases illustrated at stations 3 through 6 all take place within the bacterial cell.

Using the viral DNA as a template, a strand of messenger RNA (i; mRNA) is synthesized. This is called the transcription phase (station 3). The mRNA, with instructions for the production of viral protein, passes to the bacterial ribosomes (j) where viral protein (k) is synthesized. Viral proteins soon begin to appear in the bacterial cytoplasm. This is the synthesis phase of viral replication (station 4).

The viral structures are constructed from DNA and the viral protein, and parts of the virus-to-be are soon seen in development. This is the assembly phase (station 5). The assembly of the phage has been observed by researcher workers with the aid of the electron microscope. This assembly is undertaken with enzymes whose production was directed by the mRNA synthesized according to instructions in the viral DNA. As the capsids are put together, viral DNA is enfolded into the interior of these structures. The viral DNA is synthesized from components of the bacterial DNA. As replication activity is completed, all of the bacterial DNA will disappear. The pins attach to the core, and then the tail sheath surrounds the core. The capsid is formed and attached. Attachment of the fibers completes the assembly phase.

As phage construction is completed, the numbers of phages swell within the bacterial wall. A viral-directed enzyme (lysozyme) breaks down the bacterial wall, permitting rupture, and killing the bacterial cell (station 6: release phase). Hundreds of phages are released, each identical in structure and genetic sequence to the one that began the process.

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VIRAL REPLICATION

BACTERIOPHAGE a
CAPSID b
TAIL SHEATH c
PIN d FIBER d¹
CENTRAL CORE e
VIRAL DNA f

① UNION PHASE ✿¹

② PENETRATION PHASE ✿²

BACTERIAL CELL WALL g
RECEPTOR SITE g¹
PENETRATION SITE g²
BACTERIAL DNA h

Cytoplasm

③ TRANSCRIPTION PHASE ✿³

mRNA i

RIBOSOME j

④ SYNTHESIS PHASE ✿⁴

VIRAL PROTEIN k

⑤ ASSEMBLY PHASE ✿⁵

⑥ RELEASE PHASE ✿⁶