

Standard 2 Objective 3 Investigate the structure and function of cells and  
cell parts

52 Question(s)  
Test ID: 2142483950

Name: \_\_\_\_\_

Date: \_\_\_\_\_

- 1) Read the following situation, then answer the question below:

Sarah wanted to find out if temperature has an effect on the growth of bread mold. She grew the mold in nine containers containing the same amount and type of nutrients. Three containers were kept at 0 degree Celsius, three were kept at 90 degrees Celsius, and three were kept at room temperature (about 27 degrees Celsius). The containers were examined and the growth of the bread mold was recorded at the end of four days.

Which of the following is her hypothesis?

- A. the number of containers influences the amount of bread mold
- B. the amount of nutrient used will cause differences in the amount of bread mold
- C. the amount of bread mold is determined by the amount of nutrient used
- D. the amount of bread mold growth is affected by the temperature

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The controlled variable is:

- A. temperature of the containers
- B. amount and type of nutrients
- C. temperature of the bread mold
- D. amount of bread mold

- 3) Read the following situation, then answer the question below:

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The dependent or responding variable is:

- A. growth of bread mold
- B. amount of nutrients in each container
- C. temperature of the containers
- D. number of containers at each temperature

- 4) Read the following situation, then answer the question below:

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The independent or manipulated variable is:

- A. temperature of the containers
- B. amount of nutrients in each container
- C. growth of bread mold
- D. number of containers at each temperature

- 5) Students were asked to design an experiment to demonstrate characteristics of cells. The two groups were given cells from the different organisms. The results below show how two groups designed their experiments and what their results were.

Group 1

Procedure: Cells were prepared on a microscope slide and viewed under a microscope

Results: Cells were observed as small units with interior structures.

Conclusion: Cells are small and have parts

Group 2

Procedure: Placed cells in a nutrient solution and a closed container with a gas collection bottle.

Results: Gas collected in the bottle and bubbles appeared in the solution.

Conclusion: Cells alter their environment as they carry on the functions of life.

Which group correctly designed the experiment and why?

- A. Group 1, they proved that living things are composed of cells
  - B. Group 2, they showed that cells carry out the work of living things
  - C. Neither group followed the scientific procedures so the evidence is invalid
  - D. Both groups found characteristics of cells and used scientific methods
- 6) Students were asked to design an experiment to demonstrate characteristics of cells. The two groups were given cells from the different organisms. The results below show how two groups designed their experiments and what their results were.

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How has cell theory affected human life?

- A. We have modern electronics and computers
  - B. We can understand and cure many diseases
  - C. Transportation and communication has improved
  - D. We are better able to use Earth's mineral resources
- 7) Which of the following statements is NOT part of the Cell Theory?
- A. Cells reproduce by mitosis
  - B. All organisms are composed of cells
  - C. Cells are the basic unit of life
  - D. Cells come from other living cells
  - E. All plants are made of cells
- 8) In order to function, cells must maintain a constant internal environment. The maintenance of a relatively stable internal condition is called
- A. metabolism
  - B. homeostasis
  - C. active transport
  - D. osmosis
  - E. respiration
- 9) Sea urchins are relatives of starfish and live in the ocean. If sea urchin eggs are taken from the sea and placed in fresh water
- A. they will probably swell
  - B. they will probably shrink
  - C. there will be no change in their size
  - D. they will secrete solutes into the water
  - E. the amount of water leaving the cell will equal the amount of water entering the cell
- 10) Osmosis refers to
- A. the movement of solutes through a selectively permeable membrane
  - B. the active transport of water through a membrane
  - C. diffusion of water through a cell wall
  - D. diffusion of gases
  - E. diffusion of water through a selectively permeable membrane

- 11) Some brown algae will contain iodine in concentrations 2000 times greater than the surrounding sea water. What process would account for this?
- A. osmosis
  - B. diffusion
  - C. plasmolysis
  - D. exocytosis
  - E. active transport
- 12) If the concentration of sodium ions in the fluid surrounding cells decreases and the concentration of the solutes inside the cell remains constant,
- A. the cell will shrink
  - B. the cell will swell
  - C. the fluid outside of the cell will become isotonic
  - D. the fluid outside of the cell will become hypotonic
  - E. the cell will not change
- 13) Quinn places a small section of onion in a glass of salty water over night. The next morning she looks at the onion cells under the microscope. What will she see?
- A. Onion cells as they were the day before
  - B. Exploded onion cells
  - C. Bulging onion cells
  - D. Shriveled onion cells
  - E. Onion cells filled with salt crystals
- 14) Which of the following examples does NOT illustrate homeostasis?
- A. breathing harder during exercise
  - B. removing excess fluids through the kidneys
  - C. coordinating body processes through the nervous and endocrine systems
  - D. passing genetic characteristics from one generation to another
  - E. taking nutrients from the blood stream into cells
- 15) A biologist dilutes blood cells with water on a glass slide and observes them through a microscope. The cells appear to burst. The biologist wants to observe these blood cells in a dilute solution without the cells bursting. He should investigate
- A. other types of cells to see if the bursting continues
  - B. the amount of salts in the water used to dilute the blood and the amount of salts in the blood plasma
  - C. the age of the blood sample used by the biologist
  - D. the chemical make-up of the cell membrane of the blood cells
- 16) Which cell would contain the most mitochondria?
- A. skin cell
  - B. muscle cell
  - C. hair cell
  - D. blood cell
  - E. all cells contain the same number of mitochondria
- 17) Which of the following organelles would not be found in the cells of a mouse?
- A. plastids
  - B. lysosome
  - C. Golgi bodies
  - D. ribosomes
  - E. endoplasmic reticulum
- 18) Sally eats ripe apples because of the high sugar content. Which of the following plant cell structures stores the sugar?
- A. golgi apparatus
  - B. ribosomes
  - C. mitochondria
  - D. vacuoles
  - E. nucleus

- 19) Students were asked to design an experiment to demonstrate characteristics of cells. The two groups were given cells from the different organisms. The results below show how two groups designed their experiments and what their results were.

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Do these experiments support the current Cell Theory?

- A. Yes, these experiments support work done by other scientists
  - B. Yes, these experiments by themselves would prove cell theory
  - C. No, there is much more that needs to be learned about cells
  - D. No, cell theory has been proved and new experiments are not needed
- 20) Read the following situation, then answer the question below:
- Sarah wanted to find out if temperature has an effect on the growth of bread mold. She grew the mold in nine containers containing the same amount and type of nutrients. Three containers were kept at 0 degree Celsius, three were kept at 90 degrees Celsius, and three were kept at room temperature (about 27 degrees Celsius). The containers were examined and the growth of the bread mold was recorded at the end of four days.
- Which of the following would not be a suitable way to measure growth of bread mold in this experiment?
- A. the number of spots of bread mold
  - B. the size of the bread mold spots
  - C. the diameter of the bread mold spots
  - D. the color of the bread mold spots

- 21) Answer the following question as it relates to the scenario below.

John was interested in determining the effect the number of plants located in an area has on growth rate. He planted radish seeds in several milk cartons. In each of the first 5 cartons, he planted no seeds. In the next 5 cartons, he planted 1 seed 1 cm deep. In the next 5 cartons, he planted 5 seeds 1 cm deep. In the next 5 cartons, he planted 10 seeds 1 cm deep. In the next 5 cartons, he planted 15 seeds 1 cm deep. Each carton was watered daily. He measured the length of leaves daily in cm. After 4 weeks, he analyzed his results and determined the growth rates for each leaf.

What is NOT one of John's constants in the scenario as written?

- A. being watered daily
  - B. type of seeds
  - C. depth of seeds
  - D. location of plants
- 22) Answer the following question as it relates to the scenario below.
- John was interested in determining the effect the number of plants located in an area has on growth rate. He planted radish seeds in several milk cartons. In each of the first 5 cartons, he planted no seeds. In the next 5 cartons, he planted 1 seed 1 cm deep. In the next 5 cartons, he planted 5 seeds 1 cm deep. In the next 5 cartons, he planted 10 seeds 1 cm deep. In the next 5 cartons, he planted 15 seeds 1 cm deep. Each carton was watered daily. He measured the length of leaves daily in cm. After 4 weeks, he analyzed his results and determined the growth rates for each leaf.
- What would be the MOST appropriate additional constant?
- A. amount of sunlight
  - B. size of seeds
  - C. amount of water
  - D. brand of milk carton

23) Answer the following question as it relates to the scenario below.

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What is the appropriate unit for the dependent variable?

- A. count
- B. cm
- C. cm/day
- D. depth

24) Answer the following question as it relates to the scenario below.

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What are the repeated trials for the experiment?

- A. 5 cartons
- B. 1 cm deep
- C. 4 weeks
- D. length of leaf

25) Answer the following question as it relates to the scenario below.

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It is found that the growth rate decreases as the concentration of plants increases. What is the best explanation for this finding?

- A. the plants cannot get enough sunlight
- B. the plants compete for nutrients
- C. water is unable to filter through to all the plants
- D. some plants do not have enough soil

26) Your skin replaces the cells that it is continually losing by using the process of:

- A. transduction
- B. mitosis
- C. meiosis
- D. lysis
- E. glycolysis

27) Galileo made the first biological observation through a microscope. Robert Hooke named "cells". Anton van Leeuwenhoek perfected the light microscope and its viewing capability. Matthias Schleiden used improved microscopes to view the nucleus of plants and to propose all plants are made of cells. Theodor Schwann stated all animals are made of cells. Rudolph Virchow, after completing studies of cell growth and reproduction, concluded cells come from existing cells. All of their contributions culminated in the Cell Theory.

- A. They were dishonest men because they took each other's prior knowledge
- B. No more study of cells is needed because we know everything about cells
- C. Science is ongoing and subject to further study
- D. No need to bother with more research since it is just a theory, and really cannot be true

28) When the turgor pressure of a cell is high, a plant cell will

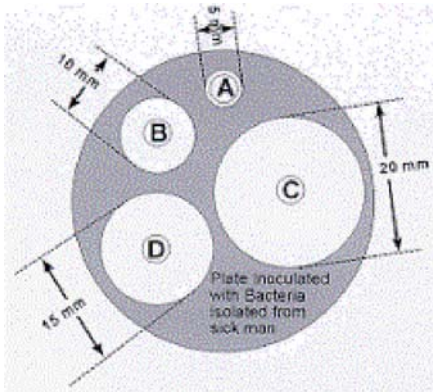
- A. explode
- B. be firm or rigid
- C. plasmolyze
- D. die
- E. be limp

- 29) One important characteristic of prokaryote cells is that they
- A. have no nucleus or any membrane-bound organelles
  - B. lack cell walls
  - C. have no DNA
  - D. have no cell membrane
  - E. have no cytoplasm
- 30) What cell structure makes it possible for the internal environment of a cell to differ from the external environment?
- A. endoplasmic reticulum
  - B. cell wall
  - C. middle lamella
  - D. cell membrane
  - E. nucleus
- 31) The pancreas is an organ that creates the protein insulin. Which organelle in a pancreas cell packages insulin to be secreted out of the cell?
- A. golgi apparatus
  - B. ribosomes
  - C. mitochondria
  - D. vacuoles
  - E. nucleus
- 32) Some students are studying lighting conditions for plants. They choose twelve plants of about the same height. They place six of the plants in a sunny window. They keep the other six in a dark cabinet. Plant height is measured daily for three weeks. Temperature and humidity are also measured and recorded daily. All plants are watered regularly. After one week, the plants in the dark cabinet look sickly.

The growth of the plants is determined in this experiment by:

- A. measuring the length of time the plants are exposed to light
  - B. measuring the distance from the soil surface to the tip of the plant
  - C. measuring environmental conditions such as temperature and humidity
  - D. counting the number of leaves on each plant
- 33) A lady grows violets as a hobby. She has six red violets and six white violets. A friend told her that violets produce more flowers when they receive morning sunlight. She then made the following hypothesis:
- If violets receive morning sunlight rather than afternoon sunlight, they will produce more flowers.*
- Which plan should she choose to test her hypothesis?
- A. Set all of her violet plants in the morning sun. Count the number of flowers produced by each. Do this for a period of four months. Then find the average number of blossoms produced by each kind of plant
  - B. Set three white violets in the morning sun and the other three white violets in the afternoon sun. Do not study the red violets at all. Count the number of flowers produced by each white violet for four months
  - C. Set all of her plants in the morning sunlight for four months. Count the number of flowers produced during this time. Then set all of the plants in the afternoon sunlight for four months. Count the number of flowers produced during this time
  - D. Set three red and three white violets in the morning sunlight and three red and three white violets in the afternoon sunlight. Count the number of flowers produced by each plant for four months
- 34) To test the hypothesis that germinating seeds of different species might influence one another, a biologist planted seeds of species I and species II in the same tray. Upon germination it was found that species I seeds sprouted faster than species II seeds.
- In order for the results to be interpreted properly, the biologist should also germinate
- A. I and II seeds in the dark
  - B. I and II seeds at various temperatures
  - C. the same number of I seeds as II seeds
  - D. I and II seeds in separate trays
- 35) If you wished to test the hypothesis that atomic radiation slows down the rate of radish seed growth, which of the following experimental designs would be best to use?
- A. Use 25 radish seeds and 25 pea seeds and compare results

- B. Plant 50 irradiated seeds and note the effects of the radiation  
 C. Plant 25 irradiated seeds and 25 normal seeds at the same time and compare results  
 D. Plant 25 normal seeds, note the results; then plant 25 irradiated seeds, and compare results
- 36) At one time, many people believed that life spontaneously arose from non-living things. For example, many people believed that spoiled meat produced living maggots. Why was spontaneous generation accepted back then but is no longer accepted as a valid theory today?
- A. The current theory of the origin of life has now been proven  
 B. In science, theories do not last more than 100 years; they are replaced because they get old  
 C. In the past the best data available to scientists supported the idea, but today the scientific community has collected new data  
 D. Spontaneous generation was only a hypothesis, was never viewed as a theory, and was disproved by the famous scientist Louis Pasteur
- 37) Answer the question below using this diagram of a bacteria culture plate.

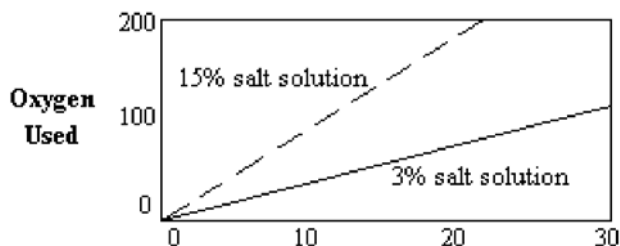


The cause of an infection seems to be bacteria that will grow in a medium containing dextrose nutrient agar. The culture plate shows the effect of four different antibiotics on this bacterium. (The antibiotics are on the paper discs labeled A through D.)

In order to know for sure which antibiotic is most effective in preventing bacterial growth on the agar plate, you would need to know the

- A. number of hours the control plate had been incubated  
 B. severity of the infection  
 C. results from a control plate with the organism growing on non-nutrient agar  
 D. concentration of the antibiotic on each disc
- 38) Some organisms can survive in water of widely different salt concentrations. Brine shrimp are an example. They maintain a constant concentration of salt in their bodies in a wide range of concentrations of salt in the water around them. They survive in water containing from 0.5% to 25% salt.

The investigator who graphed the data below used the amount of oxygen taken up by the brine shrimp as an indication of how much food energy they were using, in water of two different salt concentrations. Food was supplied in unlimited amounts to both groups of the brine shrimp. The investigator observed that brine shrimp in a 15% salt solution swam somewhat less actively than brine shrimp in 3% salt solution. Females in 15% salt solution produced fewer eggs than females in 3% salt solution.

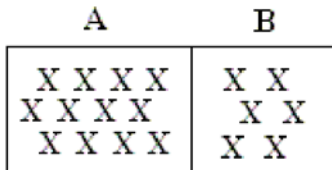


What do the data show?

- A. Brine shrimp in a 3% salt solution use less energy searching for food than brine shrimp in a 15% salt solution  
 B. Brine shrimp in a 15% salt solution use more energy but are more sluggish than brine shrimp living in a 3% salt solution  
 C. Brine shrimp in a 15% salt solution use less energy and are less active than brine shrimp in a 3% salt solution

D. Brine shrimp eggs cannot survive in a 15% salt solution

39) Refer to the following diagram. The X's represent solutes dissolved in the water.

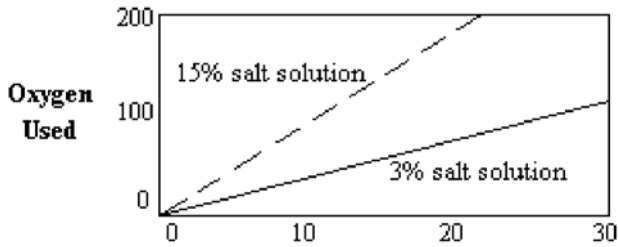


Which side of the membrane contains the hypotonic solution?

- A. A
- B. B
- C. both
- D. neither

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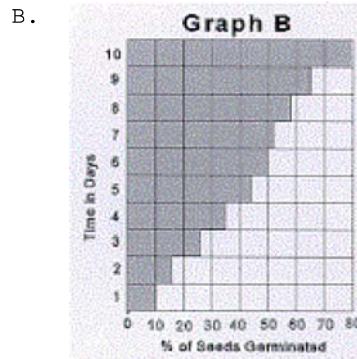
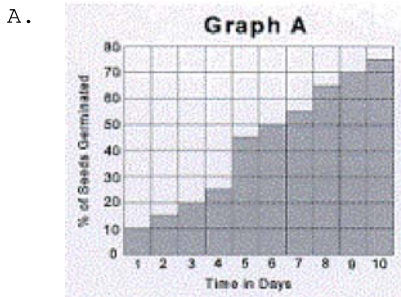


What hypothesis could the investigator have been testing?

- A. Varying salt concentrations have any measurable effects on brine shrimp O2 use
- B. Brine shrimp in a 3% salt solution use much of their available energy pumping out water
- C. Brine shrimp in a 3% salt solution maintain a uniform concentration of salt in their bodies
- D. Brine shrimp in a 15% salt solution maintain a uniform concentration of salt in their bodies

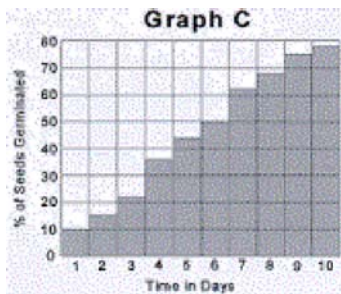
41) One hundred seeds were placed on moist paper toweling to start their growth (germination). The data below shows the percent germinated for each day for ten days. Select the graph below which best represents the data.

Time in Days	1	2	3	4	5	6	7	8	9	10
% of Seeds Germinated	10	15	22	36	44	50	62	68	75	78

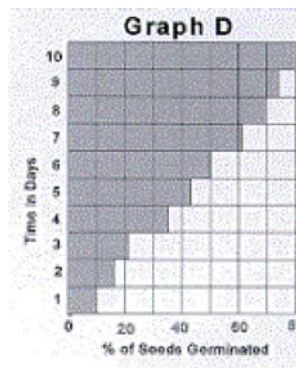




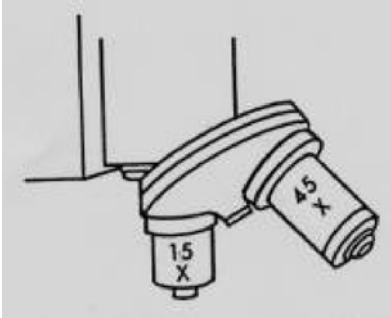
C.



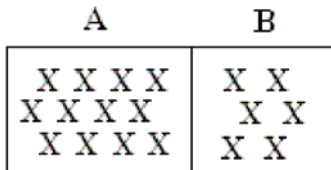
D.



- 42) Assume that this diagram represents the nosepiece and objective lenses of a microscope. Under low power magnification, 63 evenly distributed yeast cells can be seen on a slide. About how many of these same yeast cells will you see when you turn the nose piece to higher power?



- A. 7  
 B. 21  
 C. 126  
 D. 189
- 43) Refer to the following diagram. The X's represent solutes dissolved in the water.



In which direction will the net movement of water occur?

- A. A ----> B  
 B. B ----> A  
 C. equal in both directions  
 D. not enough information to know  
 E. it depends on the temperature
- 44) A student wants to observe the nucleus of a cheek cell. Which instrument would he/she use in a biology class?
- A. compound microscope  
 B. photospectrometer  
 C. magnifying glass  
 D. high speed centrifuge
- 45) Which of the following terms describes the movement of gas molecules from an area of high concentration to an area of low concentration?
- A. osmosis  
 B. active transport  
 C. filtration  
 D. diffusion
- 46) The cell theory states that all living things are made of cells. Viruses are not made of cells, but some scientists argue nonetheless that viruses are alive. What may occur, new evidence is discovered about viruses, that the cell theory does not explain?
- A. The cell theory may be modified in light of this new evidence.  
 B. The cell theory will be abandoned for a new theory.

- C. Nothing. The cell theory is a hypothesis and does not need to be supported by new evidence.  
 D. Nothing. The cell theory is scientists' best idea so it remains valid.
- 47) In 1665, Robert Hooke used a simple microscope to observe thin slices of cork. He saw many little boxes which reminded him of the places where monks lived. Based on the information, how did he most likely assist in the development of the cell theory?
- A. He studied plants and concluded that all plants are made of cells.  
 B. He gave these structures the name "cells."  
 C. He formulated the entire cell theory.  
 D. He observed cells producing other cells.
- 48) What causes vegetables to get crispy when soaked in fresh water?
- A. plasmolysis  
 B. turgor pressure  
 C. endocytosis  
 D. diffusion  
 E. active transport
- 49) Why do bacteria die when they enter a pickle vat?
- A. plasmolysis  
 B. turgor pressure  
 C. endocytosis  
 D. diffusion  
 E. active transport
- 50) What is it called when carbon dioxide moves into the leaves of plants?
- A. plasmolysis  
 B. turgor pressure  
 C. endocytosis  
 D. diffusion  
 E. active transport
- 51) An amoeba takes in food particles too large to pass through the membrane, what is the name for this?
- A. plasmolysis  
 B. turgor pressure  
 C. endocytosis  
 D. diffusion  
 E. active transport
- 52) The question below refers to an investigation in which cells were cut so that one half of the cell fragments from each group were placed in containers under uniform conditions. The table shows the results. What is the hypothesis being tested?

	Number of Cell Fragments Without Nuclei	Number of Cell Fragments With Nuclei
Number studied	100	100
Surviving 1 day	80	79
Surviving 2 days	60	74
Surviving 3 days	30	72
Surviving 4 days	3	72

- A. a nucleus is necessary for the continued life of a cell  
 B. any cell fragment will eventually die  
 C. the size of the cell fragment determines the amount of time it will live  
 D. twice as many cells will grow if each is cut in half

