

Name: _____
Class: _____

Date: _____

1. Which statement best describes the term *theory* as used in the gene-chromosome theory?

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|--|--|
| 1. A theory is never revised as new scientific evidence is presented. | 3. A theory refers to a scientific explanation that is strongly supported by a variety of experimental data. |
| 2. A theory is an assumption made by scientists and implies a lack of certainty. | 4. A theory is a hypothesis that has been supported by one experiment performed by two or more scientists. |

2. Researchers performing a well-designed experiment should base their conclusions on

- | | |
|--|---|
| 1. the hypothesis of the experiment | 3. a small sample size to insure a reliable outcome of the experiment |
| 2. data from repeated trials of the experiment | 4. results predicted before performing the experiment |

3. A student was comparing preserved specimens of three species, *X*, *Y*, and *Z*, in a classroom. Which statement is an example of an observation the student could have made and *not* an inference?

- | | |
|--|--|
| 1. The leaves produced by plant <i>X</i> are 4 cm across and 8 cm in length. | 3. Plant <i>X</i> produces many seeds that are highly attractive to finches. |
| 2. Plant <i>Y</i> has large purple flowers that open at night. | 4. The flowers of plant <i>Z</i> are poisonous to household pets. |

4. A science researcher is reviewing another scientist's experiment and conclusion. The reviewer would most likely consider the experiment *invalid* if

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| 1. the sample size produced a great deal of data | 3. it contains conclusions not explained by the evidence given |
| 2. other individuals are able to duplicate the results | 4. the hypothesis was not supported by the data obtained |

5. Which statement best describes a controlled experiment?

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| 1. It eliminates the need for dependent variables. | 3. It avoids the use of variables. |
| 2. It shows the effect of a dependent | 4. It tests the effect of a single independent |

variable on an independent variable.

variable.

6. Students were asked to determine if they could squeeze a clothespin more times in a minute after resting than after exercising. An experiment that accurately tests this question should include all of the following *except*

- | | |
|---|---|
| 1. a hypothesis on which to base the design of the experiment | 3. two sets of clothespins, one that is easy to open and one that is more difficult to open |
| 2. a large number of students | 4. a control group and an experimental group with equal numbers of students of approximately the same age |

7. Base your answer on the information below and on your knowledge of biology.

Evolutionary changes have been observed in beak size in a population of medium ground finches in the Galapagos Islands. Given a choice of small and large seeds, the medium ground finch eats mostly small seeds, which are easier to crush. However, during dry years, all seeds are in short supply. Small seeds are quickly consumed, so the birds are left with a diet of large seeds. Studies have shown that this change in diet may be related to an increase in the average size of the beak of the medium ground finch.

The most likely explanation for the increase in average beak size of the medium ground finch is that the

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|---|--|
| 1. trait is inherited and birds with larger beaks have greater reproductive success | 3. birds interbred with a larger-beaked species and passed on the trait |
| 2. birds acquired larger beaks due to the added exercise of feeding on large seeds | 4. lack of small seeds caused a mutation which resulted in a larger beak |

8. In the United States, there has been relatively little experimentation involving the insertion of genes from other species into human DNA. One reason for the lack of these experiments is that

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|--|---|
| 1. the subunits of human DNA are different from the DNA subunits of other species | 3. inserting foreign DNA into human DNA would require using techniques completely different from those used to insert foreign DNA into the DNA of other mammals |
| 2. there are many ethical questions to be answered before inserting foreign genes into human DNA | 4. human DNA always promotes human survival, so there is no need to alter it |

9. The development of an experimental research plan should *not* include a

- | | |
|---|--|
| 1. list of safety precautions for the experiment | 3. procedure for the use of technologies needed for the experiment |
| 2. list of equipment needed for conducting the experiment | 4. conclusion based on data expected to be collected in the experiment |

10. A student performed an experiment to demonstrate that a plant needs chlorophyll for photosynthesis. He used plants that had green leaves with white areas. After exposing the plants to sunlight, he removed a leaf from each plant and processed the leaves to remove the chlorophyll. He then tested each leaf for the presence of starch. Starch was found in the area of the leaf that was green, and no starch was found in the area of the leaf that was white. He concluded that chlorophyll is necessary for photosynthesis.

Which statement represents an assumption the student had to make in order to draw this conclusion?

- | | |
|--|---|
| 1. Starch is synthesized from the glucose produced in the green areas of the leaf. | 3. The white areas of the leaf do not have cells. |
| 2. Starch is converted to chlorophyll in the green areas of the leaf. | 4. The green areas of the leaf are heterotrophic. |

11. A scientist is planning to carry out an experiment on the effect of heat on the function of a certain enzyme. Which would *not* be an appropriate first step?

- | | |
|---|---|
| 1. doing research in a library | 3. completing a data table of expected results |
| 2. having discussions with other scientists | 4. using what is already known about the enzyme |

12. Which statement best describes a scientific theory?

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|---|---|
| 1. It is a collection of data designed to provide support for a prediction. | 3. It is a scientific fact that no longer requires any evidence to support it. |
| 2. It is an educated guess that can be tested by experimentation. | 4. It is a general statement that is supported by many scientific observations. |

13. Which source would provide the most reliable information for use in a research project investigating the effects of antibiotics on disease-causing bacteria?

- | | |
|---|--|
| 1. the local news section of a newspaper from 1993 | 3. a current professional science journal article on the control of pathogens |
| 2. a news program on national television about antigens produced by various plants | 4. an article in a weekly news magazine about reproduction in pathogens |

14. A student prepared a slide of pollen grains from a flower. First the pollen was viewed through the low-power objective lens and then, without moving the slide, viewed through the high-power objective lens of a compound light microscope.

Which statement best describes the relative number and appearance of the pollen grains observed using these two objectives?

- | | |
|--|--|
| 1. low power: 25 small pollen grains
high power: 100 large pollen grains | 3. low power: 25 large pollen grains
high power: 100 small pollen grains |
| 2. low power: 100 small pollen grains
high power: 25 large pollen grains | 4. low power: 100 large pollen grains
high power: 25 small pollen grains |

15. In 1910, Thomas Morgan discovered a certain pattern of inheritance in fruit flies known as sex linkage. This discovery extended the ideas of inheritance that Gregor Mendel had discovered while working with garden peas in 1865. Which principle of scientific inquiry does this illustrate?

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|---|--|
| 1. A control group must be part of a valid experiment. | 3. The same experiment must be repeated many times to validate the results. |
| 2. Scientific explanations can be modified as new evidence is found. | 4. Values can be used to make ethical decisions about scientific discovery. |

Focus on the
New York State
Learning Standards

Lesson Plan

Genes

- 2.1a** Hereditary information is contained in genes. Genes are composed of DNA that makes up the chromosomes of cells.
2.1b Each gene carries a single unit of information. A single inherited trait of an individual can be determined by one pair or by many pairs of genes. A human cell contains thousands of different genes.
2.1c Each human cell contains a copy of all the genes needed to produce a human being.
2.2a In all organisms, genetic traits are passed on from generation to generation.
2.3.3 Explain the impact of the use and abuse of electronically generated information on individuals and families.

You can understand how inherited traits are passed from parents to offspring.

Genes are tiny segments of DNA molecules that carry the instructions for inherited traits.

Long molecules of **DNA** store the genetic information of an organism.

A **chromosome** is a tightly bundled molecule of DNA.

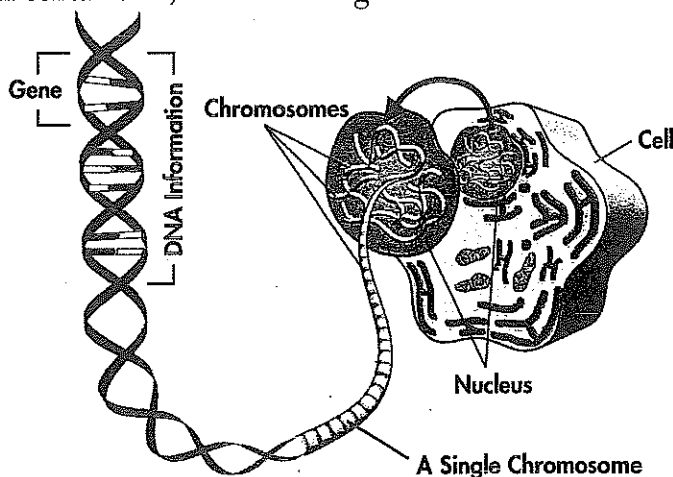
Different forms of the same gene are called **alleles**.

Guided
Instruction

DIRECTIONS Read the following information.

Inside the nucleus of every cell in your body is a complete set of coded instructions. These instructions are for building another human being identical to you. Unless you have an identical twin, no one else has instructions exactly like yours. These instructions determine whether you will have straight hair or curly hair, or brown eyes or blue eyes. The instructions for these traits come from your mother and father.

The instructions for individual traits are supplied by **genes**. Each gene carries a single instruction. Genes are tiny segments of very long **DNA** molecules. These molecules are tightly coiled and bundled up into structures called **chromosomes**. Most human cells have 23 pairs of chromosomes (46 chromosomes in all) inside their nuclei. Lined up along each chromosome are thousands of genes. It is estimated that a human body cell contains 35,000 different genes.



Guided Questions

What are **genes**?

What are located on **DNA** molecules?

How are **chromosomes** related to genes?

**INFORMATION
SYSTEMS**

Computer records of a person's genetic makeup may help doctors fight a possible future inherited disease. However, theft or misuse of such records may result in discrimination.

Like chromosomes, most genes come in pairs. An individual has two copies of each gene, one inherited from the mother and one from the father. These copies are not always identical. Different forms of a gene are called **alleles**. A particular trait can be determined by a single pair of genes or by many pairs of genes. A simple trait, such as whether or not a person has dimples, can be controlled by a single pair of genes. Traits that can occur over a wide range, such as height and skin color, are more complicated. There are many different heights and skin colors seen in humans. These traits are usually determined by the instructions from many pairs of genes.

Guided Questions

What is an **allele**?

DIRECTIONS For each question, write your answer in the spaces provided.

1. What is the relationship between a gene and a trait?

2. Is DNA like a single blueprint for the building of a house or like a book of blueprints? Explain.

3. What are some traits that are determined by more than one pair of genes?

4. A teacher shows students a string of beads as a model of a chromosome and genes. What do the beads represent? Explain.

5. Explain how computer records of a person's genetic makeup can have a positive and a negative impact.

6. Explain why the majority of genes in an organism occur in pairs.

Apply the
New York State
Learning Standards
to the State Test

Directions(7–10): For each question, write your answer in the spaces provided. Base your answers to questions 7 through 10 on the table below.

ORGANISM	NUMBER OF CHROMOSOMES PER CELL
Human	46
Lettuce	18
Fruit Fly	8
Cat	38
Potato	48
Crayfish	400
Dog	78
Bacteria	1
Sunflower	34
Goldfish	94

- 7 Which organism has the smallest number of chromosomes? Which organism has the largest?

- 8 How many *pairs* of chromosomes does a dog have in each body cell? How many chromosomes does a dog have in every sex cell? Explain your answer.

- 9 Can you conclude that there is a relationship between the number of chromosomes in plants and the number of chromosomes in animals? Explain.

- 10 Can you conclude that larger organisms have a greater number of chromosomes than smaller organisms? Explain.
-
-

Directions (11–17): Each question is followed by four choices. Decide which choice is the *best* answer. Circle the number of the answer you have chosen.

- 11 Which of the following contains only a single instruction for determining a trait in an organism?
- (1) DNA molecule
 - (2) chromosome
 - (3) gene
 - (4) cell
- 12 Which number is closest to the number of different genes in a human body cell?
- (1) 40,000
 - (2) 4,000
 - (3) 400
 - (4) 40
- 13 Which trait is most likely determined by genes?
- (1) how old a person is
 - (2) what a person likes to eat
 - (3) whether or not a person has dimples
 - (4) when a person wakes up
- 14 Where do an organism's genes come from?
- (1) the mother only
 - (2) the father only
 - (3) both the mother and father
 - (4) neither the mother nor father
- 15 How many pairs of chromosomes are there in most human cells?
- (1) 58
 - (2) 46
 - (3) 23
 - (4) 12
- 16 What are alleles?
- (1) different chromosomes
 - (2) molecules of DNA
 - (3) different forms of the same gene
 - (4) coiled bundles of DNA
- 17 Which of the following is in the correct order from the smallest to the largest?
- (1) chromosome, DNA, cell, nucleus
 - (2) DNA, chromosome, cell, nucleus
 - (3) gene, DNA, nucleus, cell
 - (4) chromosome, gene, nucleus, cell

The Respiratory System

(pages 564–572)

Respiratory System Functions

(pages 565–566)

Key Concept: The respiratory system moves oxygen from the outside environment into the body. It also removes carbon dioxide and water from the body.

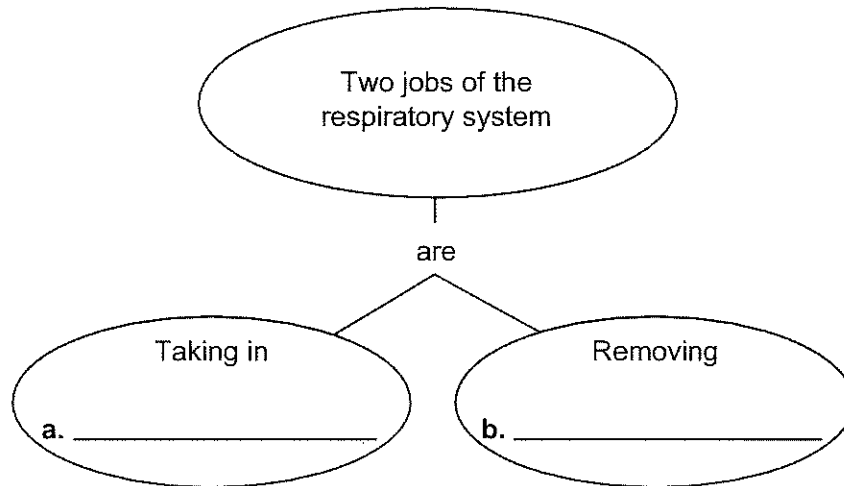
- **Respiration** is a process that takes place in your cells. It gives you energy. For respiration to take place, cells need oxygen.
- Cells produce carbon dioxide and water as waste products of respiration. Cells need to get rid of these wastes.
- The respiratory system provides oxygen for respiration. The respiratory system also gets rid of the waste products of respiration.
- The respiratory system is just one body system that makes respiration possible.
- Respiration could not take place without the digestive system and the circulatory system. The digestive system breaks down food to give the cells energy for respiration. The circulatory system carries both oxygen and food to the cells so respiration can take place. It also carries away the waste products of respiration.

Answer the following questions. Use your textbook and the ideas above.

1. Is the following sentence true or false? The respiratory system is at work when you breathe. _____

Respiration and Excretion • *Adapted Reading and Study*

2. Fill in the blank in the concept map about the respiratory system.



The Path of Air (pages 566–568)

Key Concept: As air travels from the outside environment to the lungs, it passes through the following structures: nose, pharynx, trachea, and bronchi.

- Air enters the respiratory system through the nose. From the nose, air moves to the **pharynx** (FAR ingks), or throat. Then, air goes into the **trachea** (TRAY kee uh), or windpipe. From the trachea, air passes into the bronchi. **Bronchi** (BRAHNG ky) are passages that go to the lungs.
- Most of these structures are lined with tiny hairs and a sticky material called mucus. The hairs and mucus clean and moisten the air before it reaches the lungs.
- The two **lungs** are the main organs of the respiratory system. The lungs are in the chest.
- The lungs are made up of tiny structures called **alveoli** (al VEE uh ly) (singular alveolus). Alveoli are hollow sacks. Air goes into the alveoli. In the alveoli, oxygen is removed from air and wastes are added to air.

Respiration and Excretion ▪ *Adapted Reading and Study*

Answer the following questions. Use your textbook and the ideas on page 257.

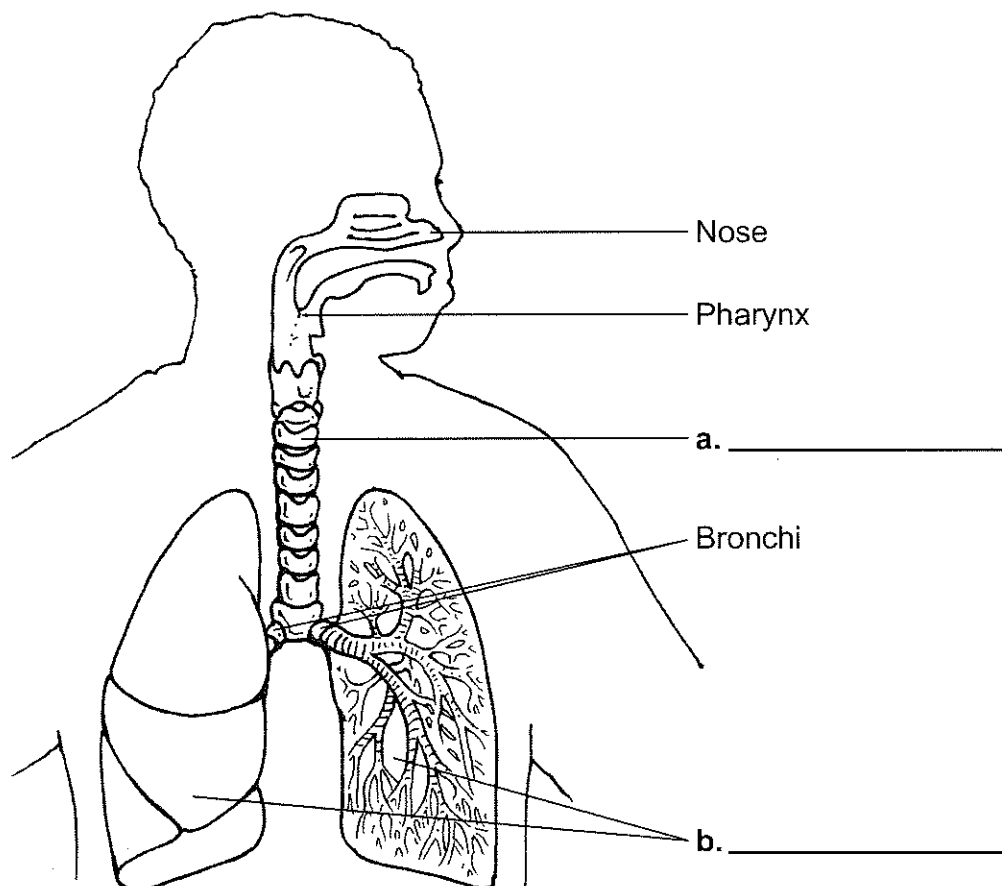
3. Read the words in the box. In each sentence below, fill in one of the words.

trachea	bronchi	alveoli
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- a. Tiny structures in the lungs where oxygen is removed from air are called _____.

- b. Passages from the trachea to the lungs are called _____.

4. Fill in the blanks in the diagram of the respiratory system.



Gas Exchange (pages 569–570)

Key Concept: After air enters the alveoli, oxygen passes through the walls of the alveoli and then through the capillary walls into the blood. Carbon dioxide and water pass from the blood into the alveoli. This whole process is known as gas exchange.

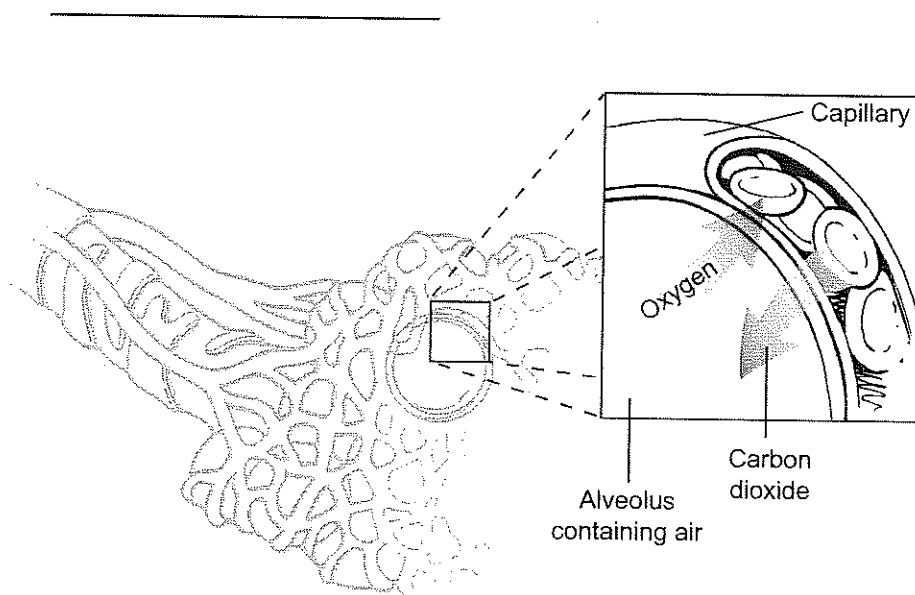
- Gas exchange takes place in the alveoli. (Remember, alveoli are tiny hollow sacks in the lungs.) Alveoli are surrounded by capillaries.
- When you breathe in, air fills the tiny sacks of the alveoli. Oxygen in the air moves out of the sacks and into the capillaries. At the same time, carbon dioxide and water in the blood move out of the capillaries and into the sacks. When you breathe out, the air leaves the sacks, taking carbon dioxide and water with it.
- If you could spread out all the alveoli in your lungs, they would cover a very big area. Alveoli give the lungs a much bigger surface for gases to move across. With alveoli, a lot of gas can be exchanged quickly.

Answer the following questions. Use your textbook and the ideas above.

5. How do alveoli help the lungs exchange gases? Circle the letter of the correct answer.
 - a. Alveoli give the lungs more energy to carry out gas exchange.
 - b. Alveoli give the lungs a bigger surface for gases to move across.
 - c. Alveoli help move air from the nose to the lungs.

Respiration and Excretion • *Adapted Reading and Study*

6. What process does the picture show?



How You Breathe (pages 570–572)

Key Concept: When you breathe, the actions of your rib muscles and diaphragm expand or contract your chest. As a result, air flows in or out.

- Breathing is controlled by the diaphragm. The **diaphragm** (DY uh fram) is a large muscle just below the lungs.
- When you breathe in, the diaphragm contracts, or gets shorter. This makes the space inside the chest get bigger. Air rushes into the lungs to fill the extra space.
- When you breathe out, the diaphragm relaxes again. This makes the space inside the chest get smaller. Air is squeezed out of the lungs.
- **Vocal cords** are tissues at the top of the trachea. When you speak, outgoing breath passes over the vocal cords. The vocal cords vibrate, or move quickly back and forth. When the vocal cords vibrate, they make sounds.

Respiration and Excretion • *Adapted Reading and Study*

Answer the following questions. Use your textbook and the ideas on page 260.

7. Fill in the blanks in the table about breathing.

How You Breathe		
What the Diaphragm Does	How the Chest Changes	Which Way Air Moves
Contracts	gets bigger	a. _____ _____
Relaxes	b. _____ _____	out of lungs

8. When air passes over the _____, they vibrate and make sounds.

Name: _____

Class: _____

Date: _____

Cell Structure and Transport Take Home Exam

___ 1. Which is found in the nucleus?

- (1.) ribosome (2.) centrosome
- (3.) vacuole (4.) lysosome
- (5.) chromosome

___ 2. Which structure composed mainly of proteins and lipids, aids in maintaining homeostasis in the cell?

- (1.) chromosome (2.) centrosome
- (3.) nucleolus (4.) cell membrane
- (5.) cell wall

___ 3. Which cellular component can NOT be seen with the compound microscope?

- (1.) DNA (2.) cell wall
- (3.) nucleus (4.) cytoplasm
- (5.) cell membrane

___ 4. In which organelle would water and dissolved minerals be stored?

- (1.) food vacuole (2.) contractile vacuole
- (3.) lysosome (4.) nucleus
- (5.) ribosome

___ 5. The organelle most directly involved in cellular aerobic respiration is the

- (1.) ribosome (2.) mitochondrion
- (3.) nucleus (4.) lysosome
- (5.) Golgi apparatus

___ 6. The rigidity (support) of a plant cell is due primarily to the presence of the

- (1.) DNA (2.) centrosomes
- (3.) cell membrane (4.) cell wall
- (5.) lysosomes

___ 7. In the laboratory, when iodine solution is used to stain a cell, the cell structure most readily seen is the

- (1.) vacuole (2.) cytoplasm
- (3.) Golgi complex (4.) lysosome
- (5.) nucleus

___ 8. Which structure permits the entry and exit of dissolved materials in an animal cell?

- (1.) lysosome (2.) chromosome
- (3.) vacuole (4.) cell wall
- (5.) cell membrane

___ 9. The structure most closely associated with the destruction of worn out cell organelles is the

- (1.) lysosome (2.) centrosome
- (3.) vacuole (4.) Golgi apparatus
- (5.) chromosome

___ 10. Krystal observes a cell under the microscope. She identifies it as a green plant cell and not a human cheek cell because of the presence of a

- (1.) nucleus (2.) cell membrane
- (3.) lysosome (4.) cell wall
- (5.) mitochondrion

___ 11. Which structure is found ONLY in animal cells?

- (1.) cell wall (2.) vacuoles
- (3.) centrioles (4.) chloroplasts
- (5.) ribosomes

___ 12. The organelle most closely associated with the manufacture of proteins within the cell is the

- (1.) ribosome (2.) lysosome
- (3.) nucleolus (4.) cell wall

___ 13. Which structure chiefly functions in intracellular transport?

- (1.) vacuole (2.) mitochondrion
- (3.) Golgi apparatus (4.) endoplasmic reticulum
- (5.) nucleolus

___ 14. Amanda is viewing cells using a light microscope. In her observations, she views a nucleus and a cell wall. Which additional organelle is she most likely to observe using the light microscope in this observation?

- (1.) ribosome (2.) cilia
- (3.) lysosome (4.) chloroplast
- (5.) endoplasmic reticulum

___ 15. The cell wall is

- (1.) selectively permeable
- (2.) contains cellulose
- (3.) living
- (4.) the structure that pumps out excess water from cells
- (5.) a hardened cell membrane

___ 16. While studying a cell with the electron microscope, a scientist notes the following: numerous ribosomes, a well-developed endoplasmic reticulum, chloroplasts, and a cell wall. Which organism is most likely the source of this cell?

- (1.) a fungus (2.) an animal
- (3.) a bacterium (4.) a plant
- (5.) a virus

___ 17. The cell's primary site of ATP production is the

- (1.) mitochondria (2.) lysosomes
- (3.) nucleus (4.) nucleolus
- (5.) vacuoles

___ 18. Cells involved with reabsorption of themselves, such as those in the tail of a tadpole, would most likely contain many

- (1.) chloroplasts (2.) lysosomes
- (3.) nuclei (4.) chromosomes
- (5.) Golgi bodies

___ 19. Which structure chiefly functions in intracellular transport?

- (1.) vacuole (2.) mitochondrion
- (3.) Golgi apparatus (4.) endoplasmic reticulum
- (5.) nucleolus

___ 20. Cyanide, a metabolic poison, interferes with the cellular aerobic production of ATP. Which cell organelle does cyanide most directly influence first in this situation?

- (1.) nucleus (2.) lysosome
- (3.) mitochondria (4.) ribosomes
- (5.) endoplasmic reticula

___ 21. Which structure chiefly functions in intracellular transport?

- (1.) vacuole (2.) Golgi apparatus
- (3.) endoplasmic reticulum (4.) nucleolus

___ 22. The structure surrounding and selectively regulating the flow of materials from the control center of the cell is the

- (1.) vacuole (2.) nuclear membrane
- (3.) cell membrane (4.) lysosome
- (5.) nucleolus

___ 23. Which is NOT part of the cell theory?

- (1.) Cells vary in size but have the same shape.
- (2.) All organisms are made of one or more cells.
- (3.) All cells carry on their own life activities.
- (4.) New cells arise only from other living cells.

___ 24. Mitochondria, ribosomes/ and vacuoles are examples of

- (1.) tissues (2.) cells
- (3.) organs (4.) organelles

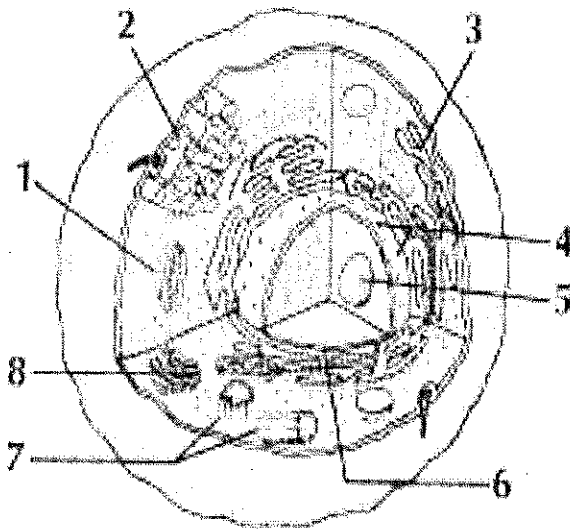
___ 25. Which of the following organisms possess prokaryotic cells?

- (1.) ameba (2.) bacteria
- (3.) fungi (4.) Humans

___ 26. A cell with 96% concentration of water molecules and 4% concentration of dissolved substances is placed in a hypertonic solution. The water molecule concentration of the solution could be

- (1.) 100% (2.) 96%
- (3.) 98% (4.) 94%

Questions 27-29 refer to the diagram below.



___ 27. composed of DNA, RNA, and protein and is the site of ribosome formation

___ 28. site of cellular respiration

___ 29. Specializes in modifying, sorting and packaging of proteins for secretion

___ 30. A solution that has the same concentration of dissolved substances as a living cell is called

- (1.) homogenous (2.) hypertonic
- (3.) isotonic (4.) hypotonic

___ 31. The watery material lying within the cell between the cell membrane and the nucleus is the

- (1.) chloroplast (2.) cytoplasm
- (3.) endoplasmic reticulum (4.) plastid

___ 32. Cells that use a great amount of energy usually contain numerous

- (1.) lysosomes (2.) vacuoles
- (3.) ribosomes (4.) mitochondria

___ 33. Robert Hooke was the first scientist to use the term

- (1.) cell (2.) nucleus
- (3.) microscope (4.) protoplasm

___ 34. As the surface area of a cell increases in size, the volume of the cell

- (1.) increases relatively more than the surface area
- (2.) increases about the same as the surface area
- (3.) decreases
- (4.) does not change

___ 35. The cell wall

- (1.) is found in animal cells
- (2.) is not found in bacteria
- (3.) lies inside the cell membrane
- (4.) has small openings

___ 36. Lamellae / grana, and stroma are closely associated with the

- (1.) chloroplast (2.) mitochondria
- (3.) nucleus (4.) cell membrane

___ 37. Endosymbiosis refers to the
(1.) selective permeability of the cell membrane
(2.) origin of the eukaryotic cell
(3.) function of an organelle in the cytoplasm
(4.) osmotic pressure in a solution

___ 38. Who was the first person to identify and see cells?
(1.) Anton van Leeuwenhoek (2.) Robert Hooke
(3.) Matthias Schleiden (4.) Rudolf Virchow

___ 39. The work of Schleiden and Schwann can be summarized by saying that
(1.) all plants are made of cells.
(2.) all animals are made of cells.
(3.) plants and animals have specialized cells.
(4.) all plants and animals are made of cells.

___ 40. Which of the following is NOT a principle of the cell theory?
(1.) Cells are the basic units of life.
(2.) All living things are made of cells.
(3.) Very few cells reproduce.
(4.) All cells are produced by existing cells.

___ 41. Which cell structure contains the cell's genetic material and controls the cell's activities?
(1.) organelle (2.) nucleus
(3.) cell envelope (4.) cytoplasm

___ 42. Which structure contains the other?
(1.) nucleus; cytoplasm
(2.) nucleus: genetic material
(3.) cell membrane: cell wall
(4.) prokaryote: organelles

___ 43. Which of the following contains a nucleus?
(1.) prokaryotes (2.) bacteria
(3.) eukaryotes (4.) organelles

___ 44. Eukaryotes usually contain
(1.) a nucleus. (2.) specialized organelles.
(3.) genetic material. (4.) all the above

___ 45. The main function of the cell wall is to
(1.) support and protect the cell.
(2.) store DNA.
(3.) direct the activities of the cell.
(4.) help the cell move.

___ 46. Unlike the cell membrane, the cell wall is
(1.) found in all organisms.
(2.) composed of a lipid bilayer.
(3.) a flexible barrier.
(4.) made of tough fibers.

___ 47. You won't find a cell wall in which of these kinds of organisms?
(1.) plants (2.) animals
(3.) fungi (4.) none of the above

___ 48. Which of the following is a function of the nucleus?
(1.) stores DNA
(2.) controls most of the cell's processes
(3.) contains the information needed to make proteins
(4.) all of the above

___ 49. Which of the following is NOT found in the nucleus?
(1.) cytoplasm (2.) nucleolus
(3.) chromatin (4.) DNA

___ 50. Which of the following statements explains why the nucleus is important to cells?

- (1.) Only eukaryotes have nuclei.
- (2.) Only prokaryotes have nuclei.
- (3.) The nucleus contains coded instructions for making proteins.
- (4.) The nucleus is surrounded by a nuclear envelope.

___ 51. Which of the following is NOT a function of the cytoskeleton?

- (1.) helps the cell maintain its shape
- (2.) helps the cell move
- (3.) prevents chromosomes from separating
- (4.) helps organelles within the cell move

___ 52. Which organelle makes proteins using coded instructions that come from the nucleus?

- (1.) Golgi apparatus (2.) mitochondrion
- (3.) vacuole (4.) ribosome

___ 53. Which organelles help provide cells with energy?

- (1.) mitochondria and chloroplasts
- (2.) rough endoplasmic reticulum
- (3.) smooth endoplasmic reticulum
- (4.) Golgi apparatus and ribosomes

___ 54. Which organelle would you expect to find in plant cells but not animal cells?

- (1.) ribosome (2.) mitochondrion
- (3.) chloroplast (4.) smooth endoplasmic reticulum

___ 55. Which of the following structures serves as the cell's boundary from its environment?

- (1.) mitochondrion (2.) cell membrane
- (3.) chloroplast (4.) channel proteins

___ 56. The cell membrane contains channels and pumps that help move materials from one side to the other. What are these channels and pumps made of?

- (1.) carbohydrates (2.) lipids
- (3.) bilipids (4.) proteins

___ 57. Diffusion is the movement of molecules from

- (1.) an area of low concentration to an area of high concentration.
- (2.) an area of high concentration to an area of low concentration.
- (3.) an area of equilibrium to an area of high concentration.
- (4.) all of the above

___ 58. Diffusion occurs because

- (1.) molecules constantly move and collide with each other.
- (2.) the concentration of a solution is never the same throughout a solution.
- (3.) the concentration of a solution is always the same throughout a solution.
- (4.) molecules never move or collide with each other.

___ 59. When the concentration of molecules on both sides of a membrane is the same, the molecules will

- (1.) move across the membrane to the outside of the cell.
- (2.) stop moving across the membrane.
- (3.) move across the membrane in both directions.
- (4.) move across the membrane to the inside of the cell.

___ 60. Which of the following is an example of an organ?

- (1.) heart (2.) epithelial tissue
- (3.) digestive system (4.) nerve cell

