PRACTICE TEST 2

SCIENCE

50 questions
90 minutes

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Practice Test 2: Science

1. All of the following may inhibit enzymatic reactions EXCEPT:

   A. temperature
   B. pH level
   C. excess of substrate
   D. lack of substrate

2. All of the following are steps of photosynthesis EXCEPT:

   A. Chlorophyll is absorbed through plant roots.
   B. During photolysis a photon of light is absorbed by the chlorophyll pigment, which then is in an excited (higher energy) state.
   C. Water is separated into hydrogen and oxygen atoms.
   D. An ADP molecule is phosphorylated to ATP.

3. Which has the least mass?

   A. proton
   B. neutron
   C. electron
   D. hydrogen atom

4. Most animals have internal or external skeletons for structure and support. Which of the following parts provide a similar function in plant cells?

   A. cytoplasm
   B. chloroplasts
   C. cell membranes
   D. cell walls

Match the following terms to their definitions to answer questions 5–8.

   A. Gravity
   B. Force
   C. Inertia
   D. Momentum

5. Mass times acceleration

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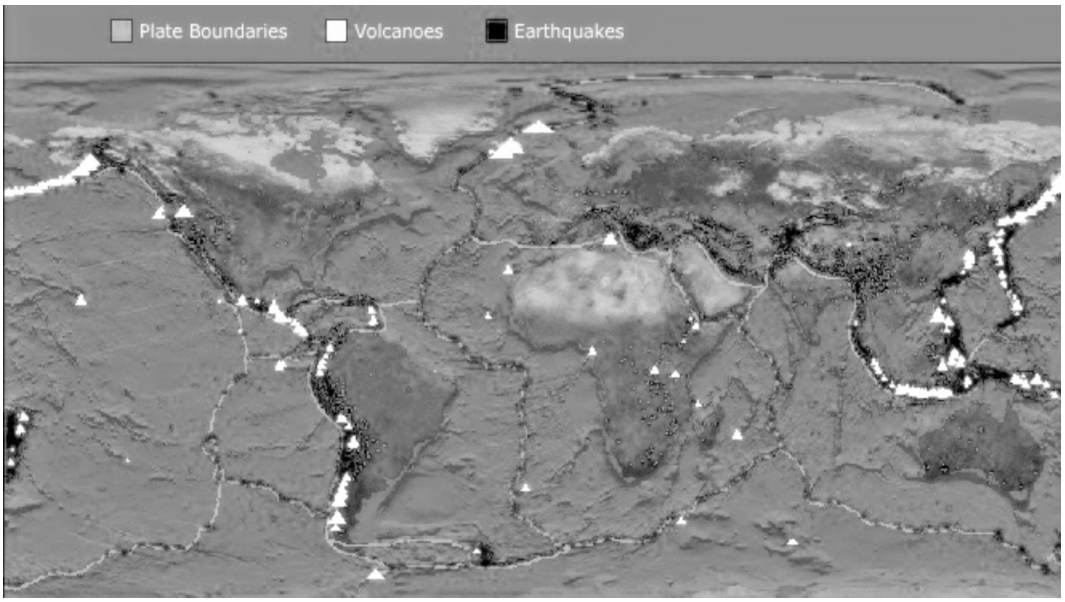
6. Acts at a distance and attracts bodies of matter toward each other

7. Mass times velocity

8. A particle at rest will stay at rest and a particle in motion will stay in motion until acted upon by an outside force.

Use the text and diagram to answer questions 9–10.

The crust is the outermost layer of what we think of as "the Earth." It includes the mountains, valleys, continents, continental shelves, ocean basins, etc. The crust is rich in oxygen, silicon, and aluminum, with lesser amounts of other elements like iron, nickel, etc. It has low density (2.5 to 3.5 gm/cm^3), that floats on the denser mantle. Several separate tectonic plates float beneath it on the surface of the mantle. The tectonic plates touch but magma can leak between the plates, at times causing volcanoes or the formation of underwater ocean ridges of new rock.



9. There is a line of volcanic activity that shows up in white on this map. It stretches through the Aleutian Islands of Alaska, around the Eastern shore of Asia, Japan, and the Pacific Islands, to the Western shore of South America and Central and North America. This area has been nicknamed the "Ring of Fire" due to its highly volatile volcanic activity. Explain using evidence from the map and text why this area would be subject to high volcanic disruption.

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10. Many of Earth's major landforms are features that occurred due to _____ hitting each other.

    A. continental shelves
    B. continents
    C. tectonic plates
    D. faults

11. Pathogens in the form of airborne droplets are most likely to cause which of the following illnesses?

    A. throat infection
    B. stomach virus
    C. AIDS
    D. malaria

12. In glycolysis, a molecule of glucose is broken down into all of the following EXCEPT

    A. pyruvic acid
    B. ATP
    C. CO_2
    D. H^+

13. When astronomers observe the redshift of light from a faraway star, this means that the star is

    A. moving away from us.
    B. moving toward us.
    C. ready to explode.
    D. a dwarf star.

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14. Rabbits are not native to Australia, having been brought there from England by sailors in the 18th century. Yet rabbits have thrived and have, in fact, overpopulated Australia. In addition, rabbits and certain native Australian wallabies, although not closely related, resemble each other as to body structure and habits. Which idea about evolution is supported by these facts?

    A. Mass extinctions of species and the emergence of new species can be studied by examining the fossil record.

    B. Different species originally developed because of changes in some shared ancestral genetic code.

    C. Many species have body parts that look similar because they evolved from the same ancestral mammal.

    D. Species evolve in similar ways when they react to similar surroundings.

Use the following list to answer questions 15–17.

A. Radiation

B. Convection

C. Irradiation

D. Conduction

15. An athlete with a sore shoulder places a warm compress on it to transfer energy to soothe the muscle.

16. On a cold February morning, a blower system in a car warms up after several minutes and blows air through vents in the floor, dashboard, and under the windshield. Eventually, the driver is able to unbutton his coat and stay warm even though the outside temperature is still 23°F.

17. Getting ready for a fall cruise inspires a young lady to spend a couple of weeks going to a local spa and reclining under a tanning lamp. However, such practices might result in dangerous overexposure to ultraviolet rays that can lead to cancer or premature aging of the skin.

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Use the following passage and graph, as instructed, to answer questions 18–20.

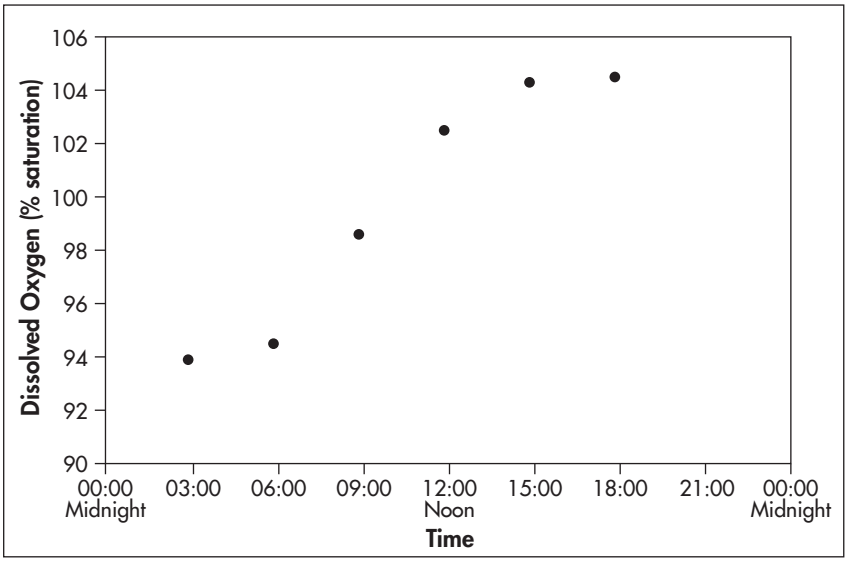
Fish health in ponds depends on dissolved oxygen mostly produced through the process of photosynthesis by phytoplankton (microscopic plants).

$$\underset{\text{Carbon dioxide}}{6CO_2} + \underset{\text{Water}}{6H_2O} \xrightarrow[\text{nutrients}]{\text{sunlight}} \underset{\text{Carbohydrate}}{C_6H_{12}O_6} + \underset{\text{Oxygen}}{6O_2}$$

The equation above illustrates the process of photosynthesis. Photosynthesis occurs during the day producing oxygen. At night the process of respiration occurs in the phytoplankton, represented by the equation below. It uses dissolved oxygen and produces carbon dioxide.

$$\underset{\text{Oxygen}}{6O_2} + \underset{\text{Carbohydrate}}{C_6H_{12}O_6} \xrightarrow[\text{nutrients}]{\text{sunlight}} \underset{\text{Carbon dioxide}}{6CO_2} + \underset{\text{Water}}{6H_2O} + \text{Energy}$$

Changes in pond's dissolved oxygen saturation level over a 24-hour period



18. The graph above shows the pattern of dissolved oxygen in a pond over a 24-hour period due to the photosynthetic and respiration processes. Think about how you would complete the last two points on the graph for the hours of 21:00 and 00:00 (midnight) on day 2. The last two points on the graph would

    A. go a lot higher.
    B. drop quite a bit.
    C. go up a little.
    D. drop a bit.

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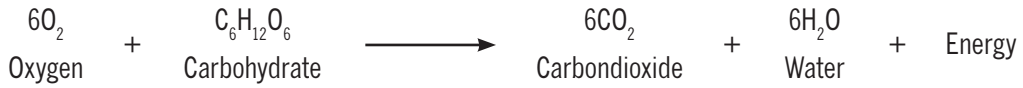
19. The respiration reaction shown below and that occurs at night is a Select . . . reaction.

- decomposition
- combination
- replacement
- double replacement



20. Considering the information provided in the text and the graph, explain what effect shortening days of sunlight in winter would have on the pond ecosystem.

21. Energy flows through the food chain from

A. producers to consumers to decomposers.
B. producers to secondary consumers to primary consumers.
C. decomposers to consumers to producers.
D. secondary consumers to producers.

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Use the following information to answer questions 22–25.

Normal skin color in mice is dominant to albino. In the following questions, N stands for normal skin color and n for albino.

22. Three offspring of two normal-skinned parents have normal skin, but one is albino. Which of the following must be true?

    A. One parent must have the NN genotype.
    B. Both parents must have the NN genotype.
    C. One parent must have the nn genotype.
    D. Both parents must have the Nn genotype.

23. The albino offspring from the F_1 generation described above produces one albino offspring and one normal offspring in the F_2 generation. What must be the genotype of the albino's mate?

    A. either Nn or NN
    B. either Nn or nn
    C. Nn
    D. nn

24. What percentage of the offspring of two albino parents would most likely be normal?

    A. 100%
    B. 50%
    C. 10%
    D. 0%

25. What are the chances that two normal parents each carrying recessive genes for albinism could have a heterozygous normal offspring?

    A. 1 out of 2
    B. 3 out of 4
    C. 2 out of 3
    D. 0 out of 4

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26. Which of the following chemical equations is NOT properly balanced?

A. $FeCl_3 - 3NaOH \rightarrow Fe(OH)_3 - 3NaCl$

B. $CH_4 + O_2 \rightarrow CO_2 + 2H_2O$

C. $C_3H_3 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

D. $2NaCL + F_2 \rightarrow 2NAF + CL_2$

27. The Select . . . is the densest atmospheric layer, accounting for most of the mass of the atmosphere. It contains 99% of the water vapor found in the atmosphere.

- stratosphere
- troposphere
- exosphere

Use the following information to answer questions 28–29.

The formation of holes in the Earth's ozone layer due to chemicals used by humans allows more ultraviolet (UV) light to reach the oceans. Increased UV light can kill phytoplankton, marine algae, and other microorganisms.

28. Which statement BEST describes how a large decrease in phytoplankton and marine algae would affect the ocean food web?

A. The effect would not be drastic since the organisms are so small.

B. The number of marine animals would decrease due to the decrease in producers.

C. The number of consumers in the food web would increase as the producers decrease.

D. The number of decomposers would increase as the phytoplankton and marine algae die.

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29. Which of the following explains the MOST LIKELY effect of increased UV light on alpine and polar lakes that are very clear?

    A. The increase in solar UV radiation would increase the rate of mutation in microorganisms such as phytoplankton and algae, so that they would no longer be a healthy food source for marine animals.

    B. The UV light would raise the temperature of the alpine and polar lakes, which would help the microorganisms repair themselves.

    C. The UV light would stimulate photosynthesis, resulting in a more stable ecosystem.

    D. The UV light would penetrate to a greater depth in lakes that have clear water, potentially doing greater damage to the ecosystem.

30. Why does a food chain generally have no more than five trophic levels?

    A. There is a loss of energy at each trophic level.

    B. There is no way to determine the upper trophic levels.

    C. Many organisms have multiple food sources.

    D. The loss of biodiversity has limited the variety of organisms.

31. Which of the following statements is correct in comparing and contrasting prokaryotes and eukaryotes?

    A. Eukaryotes are much larger than prokaryotes, but otherwise they share the same structure.

    B. Cytoplasm is found in both prokaryotes and eukaryotes but in a slightly different form in each.

    C. Both prokaryotes and eukaryotes are mainly multicellular.

    D. Prokaryotes and eukaryotes both have distinct organelles, although prokaryotes have fewer of them.

32. Which of the following is NOT included in the body's first line of defense against disease-causing agents?

    A. stomach acid

    B. mucous membranes

    C. phagocytes

    D. cilia

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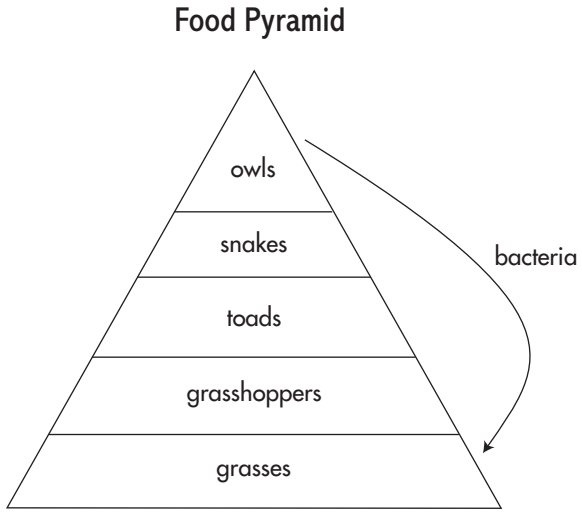
33. A ball rolling at a velocity of 12 m/sec hits a wall after 36 seconds. What is the acceleration of the ball?

A. –23.334 m/sec
B. 23.334 m/sec
C. 0.334 m/sec^2
D. $–0.334\ m/sec^2$

34. A food pyramid is shown below.



In this food pyramid, toads are which of the following?

A. primary consumers
B. secondary consumers
C. producers
D. tertiary consumers

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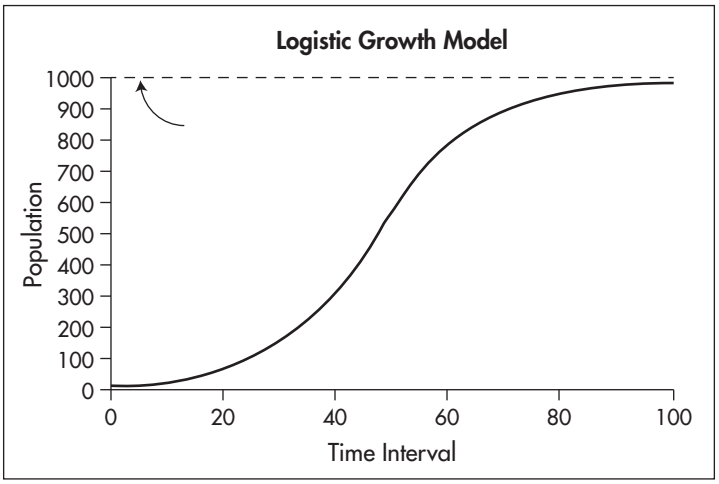
35. Look at the population graph below.



Which of the following population factors does the dotted line represent?

A. lack of competitors
B. carrying capacity
C. migration
D. frequency of reproduction

36. The Florida panther once roamed widely in the southeastern United States. The number of Florida panthers was drastically reduced due to loss of habitat, hunting, and even collisions with automobiles. By the 1970s, the estimated number of Florida panthers had shrunk to only six. Which of the following describes the most likely next stage in this situation?

A. genetic defects in the population due to inbreeding
B. genetic diversity due to interbreeding with other free-roaming puma species
C. improvement of the Florida panther's gene pool due to inbreeding
D. development of two new breeds of Florida panther

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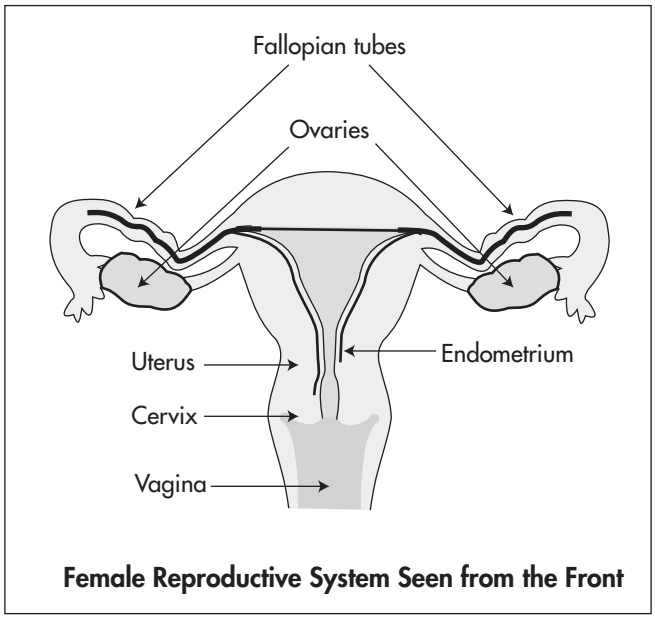
37. Cyclooxygenase-2 (COX-2) is an enzyme vital to the production of the prostaglandins, but also contributes to the inflammation of joints in medical conditions such as arthritis. New medications that block the production of prostaglandins by COX-2 enzymes and thereby relieve the symptoms of arthritis are a type of which of the following?

A. hormone
B. chemical inhibitor
C. ion
D. prosthetic group

Use the diagram below of the human female reproductive system to answer question 38.



Female Reproductive System Seen from the Front

38. In human sexual reproduction, the fertilized ovum attaches to which of the following?

A. fallopian tube
B. uterus
C. endometrium
D. vagina

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39. A person who contracts chicken pox as an adult lacks which of the following?

    A. memory cells
    B. memory cells for a specific pathogen
    C. plasma cells
    D. B lymphocyte cells

40. The water molecule has many special properties. Which of the following occurs because of water's cohesive behavior?

    A. Water is able to cool down and heat up slowly.
    B. Water is able to float in solid form.
    C. Water is able to dissolve many substances.
    D. Water is able to move from the roots to the leaves of plants.

41. Which of the following is NOT one of the ways in which the carbon cycle uses carbon to build organic compounds?

    A. plant and animal respiration
    B. transpiration
    C. photosynthesis
    D. combustion

Use the following terms to answer questions 42–43.

    A. Cellular respiration
    B. Fermentation
    C. Krebs Cycle
    D. Photosynthesis

42. Anaerobic process producing two ATP molecules per glucose molecule.

43. Breaks down pyruvic acid molecules into CO_2 molecules, H^+ (protons), and 2 ATP molecules.

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Use the following information to answer questions 44–46.

A student wants to know how temperature affects the rate of the catalyzed reaction for the stomach enzyme pepsin. She sets up an experiment in the lab using reaction chambers set at varying temperatures.

44. Identify the independent variable and dependent variable for this experiment and place the correct component into the boxes:

Independent	Dependent

Variables

- Pepsin
- Rate of reaction
- Temperature (°C)
- Catalyzation reaction

45. In which step of the nitrogen cycle do bacteria and fungi break excess nitrates back into their elements and release elemental nitrogen back into the atmosphere?

A. ammonification
B. denitrification
C. nitrogen fixing
D. decomposition

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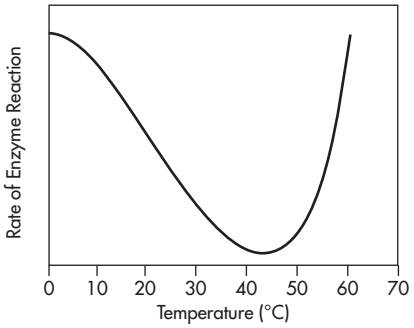
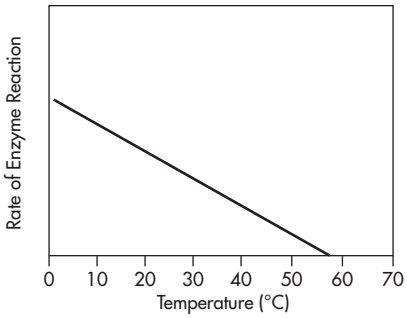
46. Which graph shows the MOST LIKELY result of this experiment?

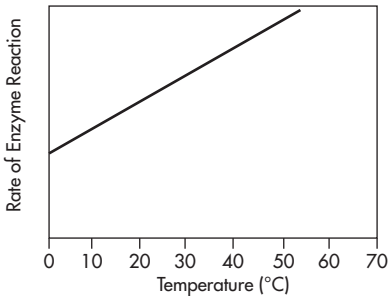
A.



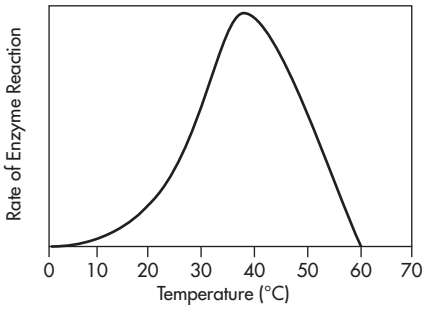
B.



C.



D.



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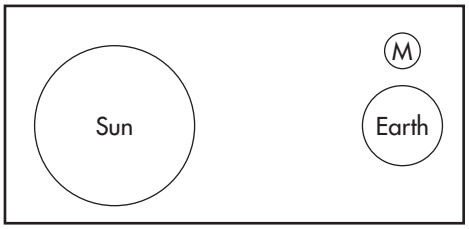
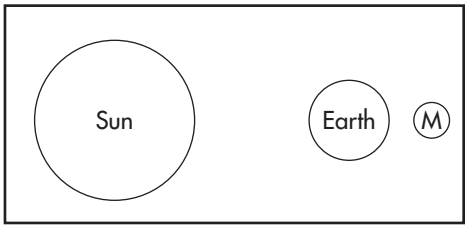
47. The gravity from the Moon pulls the ocean, causing it to bulge and rise on one side while it lowers on the other as the Earth rotates and the Moon orbits, forming tides. The Sun has some gravitational effect on tides, but not as much as the Moon. Tides rise and fall daily with the rotation of the Earth. Especially high (spring) tides occur during which of the following positions of the Sun/Earth/Moon?

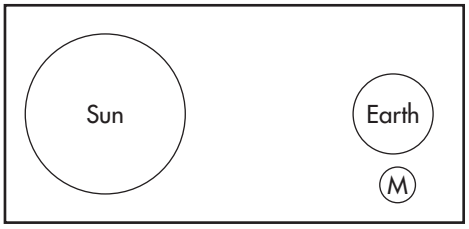
A.



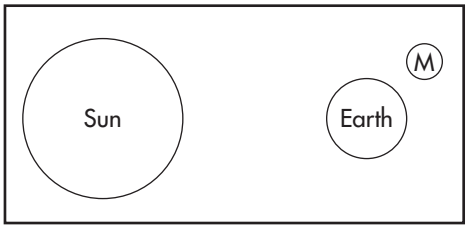
B.



C.



D.



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Use the information in the following table to answer questions 48–50.

Properties of Substances				
Substance	Reaction with Water	Phase at Room Temperature	Reaction to Flame	Density
Hydrogen (gas)	none	gas	explosive	0.00009 g/ml
Sodium	bubbling	solid	explosive	0.97 g/ml
Mercury	none	liquid	none	13.6 g/ml

48. Which substance would be considered most highly reactive?

    A. hydrogen
    B. sodium
    C. mercury
    D. argon

49. It was concluded from these tests that the phase of a substance determines how reactive it would be. Is this a reasonable conclusion from the data included in the table?

    A. It is a reasonable conclusion since both gases do not react with water
    B. It is a reasonable conclusion since the solid is the most reactive
    C. It is a reasonable conclusion since not all substances can be reactive
    D. It is a poor conclusion since the two gases have very different reactions

50. Which of the tests noted in the table measured physical properties?

    A. density, reaction to flame
    B. reaction to flame and water
    C. density, phase
    D. phase, reaction to water

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Answers: Science Practice Test 2

1. **C.**

Environmental conditions such as heat or acidity inhibit enzymatic reactions by changing the shape of the active site and rendering the enzyme ineffective. Certain chemicals inhibit enzymatic reactions by changing the shape of the enzyme's active site. If there is a lack of substrate, the enzyme will have no substance to affect. Thus, all of these factors may inhibit enzymatic reactions except an excess of substrate, which would not inhibit those reactions.

2. **A.**

Chlorophyll is not absorbed through plant roots; it is synthesized within plant cells. Photolysis, in which a photon of light is absorbed by the chlorophyll pigment, which then is in an excited (higher energy) state, is the first step in the photosynthetic process. The light reaction is a decomposition reaction that separates water molecules into hydrogen and oxygen atoms utilizing the energy from the excited chlorophyll pigment. Oxygen that is not needed by the cell combines to form O_2 (gas) and is released into the environment. The free hydrogen is grabbed and held by a particular molecule (called the hydrogen acceptor) until it is needed.

3. **C.**

An electron has nearly no discernible mass. A proton has a mass of 1 atomic mass unit (AMU) as does a neutron. According to the Periodic Table of Elements, an atom of hydrogen has a mass on average of 1AMU (1.007) since the most common isotope of hydrogen has no neutrons and is a single proton.

4. **D.**

Rigid cell walls made of cellulose serve the same function of structure and support in plant cells as skeletons do in animals.

5. **B.**

Force equals mass times acceleration.

6. **A.**

Gravity is defined as the force that acts at a distance and attracts bodies of matter toward each other.

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7. **D.**

Momentum is equal to mass times velocity.

8. **C.**

Inertia is the property of matter that allows a particle at rest to stay at rest and a particle in motion to stay in motion until acted upon by an outside force.

9.

[3 pts. possible]

The ring of fire is located at the edge of large tectonic plates. (1pt.) Not only is this area at the edge of tectonic plates but it also is where continental plates meet and one slides under the other, making it easy for magma to leak. (1pt.) These features, as shown on the map, make these areas more prone to volcanic activity than the center of a plate would be. (1pt.)

10. **C.**

Many of Earth's major landforms are features that occurred due to tectonic plates rubbing against each other. Such action causes the folding of rock into mountains or the slipping of one plate under another to form a continental shelf. Careful study of the tectonic plates and the land formations between them reveals how the formations came to be.

11. **A.**

A respiratory illness such as a throat infection is the most likely sickness to be caused by pathogens in airborne droplets spread by sneezing or coughing. A virus might be caught by surface contact; AIDS is a bloodborne disease and must be passed by direct blood contact; and malaria is spread by parasites such as the mosquito.

12. **C.**

CO_2 is not a product of glycolysis. Each molecule of glucose is broken down into two molecules of pyruvic acid (pyruvate), two ATP molecules, and two hydrogen atoms (attached to NADH, nicotinamide adenine dinucleotide).

13. **A.**

A redshift in the electromagnetic spectrum of the light from a faraway star means that the star is moving away from the observer. In the 1920s, Edwin Hubble (1889–1953) observed that galaxies around the Milky Way were moving away from us because of this redshift, and those farther away are moving away from us even more rapidly; it is not moving toward us.

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14. **D.**

Though rabbits and wallabies are not closely related and their geographic origins are distant, their similarities and the rabbit's ability to survive in similar habitat supports the idea that widely divergent species can evolve in similar ways when reacting to similar biogeographical environments.

15. **D.**

Conduction is the transfer of molecules by collisions, passing heat through one material into another.

16. **B.**

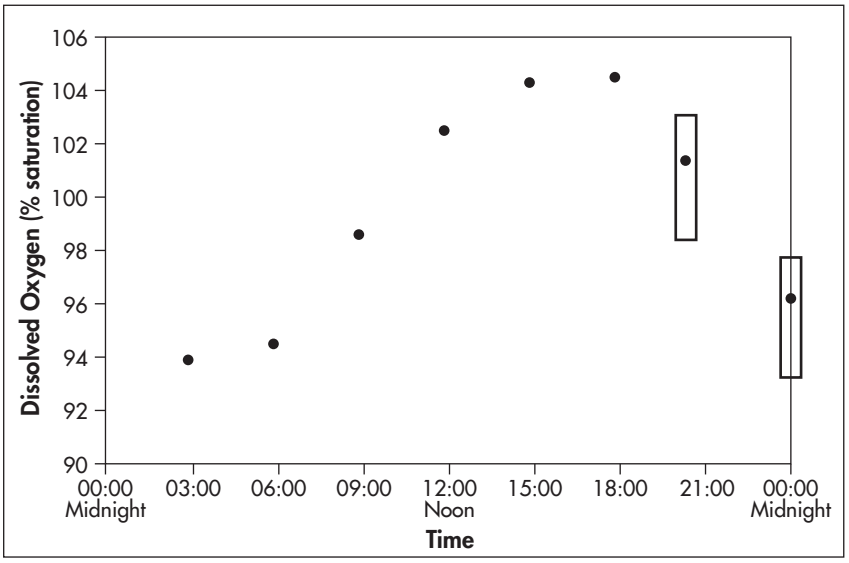
Convection is caused by the flow of heated liquid or gas through a volumetric medium.

17. **A.**

Radiation is waves traveling through space to transfer heat away from the energy source.

18. **B.**

On the actual GED® test, you would mark two **hot spots**. Answers in the range of the box are acceptable. It is important to understand from the text that the oxygen levels will drop significantly. It is also important to know how to graph this appropriately.



Changes in pond's dissolved oxygen saturation level over 24-hour period.

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19. **decomposition**

The respiration reaction discussed in the text is an exothermic reaction, releasing energy for the cell's use. It is also a decomposition reaction rather than a combination or replacement reaction.

20.

[3 pts. possible]

As the amount of daylight per day decreases in autumn and winter there is less photosynthesis and more respiration. (1 pt.) The oxygen levels in the pond will decrease and the pond will not be able to support as many fish. (1 pt.) The population of fish will drop off until the sunlight begins to increase again. (1 pt.)

21. **A.**

Energy flows through the entire ecosystem in one direction, from producers to consumers and on to decomposers through the food chain.

22. **D.**

As shown in the following Punnett square, the only way offspring could be albino is if each parent has at least one recessive gene for albinism. Since both have a normal phenotype, both must have the Nn genotype. Each parent must also have one recessive allele for albinism in order to produce one nn child.

	N	n
N	NN	Nn
n	Nn	nn

23. **C.**

The albino parent from the F_1 cross must have the nn genotype. As shown in the following Punnett square, if the mate was albino (nn) all the offspring would be albino, and if the mate was homozygous (NN), then all the offspring would be normal. In order to produce both phenotypes, the second parent must be heterozygous (Nn).

	n	n
N	Nn	Nn
N	nn	nn

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24. **D.**

All offspring of two albino parents (each must have the genotype nn) will be albino, so the answer is 0%.

25. **A.**

Referring to the Punnett square in answer 22, it is clear that the Nn × Nn cross would yield 1 out of 4 albino (homozygous), 1 out of 4 homozygous normal (NN), and 2 out of 4 heterozygous normal (Nn) children.

26. **B.**

The correct balanced equation is:

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$$

27. **troposphere**

The troposphere is the densest atmospheric layer. Accounting for most of the mass of the atmosphere, it contains 99% of the water vapor found in the atmosphere.

28. **B.**

The numbers of marine animals that are primary consumers in the ocean food web would decrease because of the decrease in phytoplankton and marine algae that these animals depend on. The small size of the organisms does not affect their importance to the ecosystem (A). The number of consumers would decrease, not increase, with the loss of microorganisms. Decomposers would also decrease due to the overall effect on the ocean food web.

29. **D.**

The most likely effect is that clear waters in alpine (mountain) and polar lakes would allow UV radiation to penetrate to a greater depth, which would increase the potential damage to the organisms in the lakes and thus to the entire ecosystem. By affecting rates of photosynthesis and reproduction, this abiotic factor would probably decrease biodiversity and limit the carrying capacity of each lake.

30. **A.**

A food chain is usually limited to no more than five trophic levels because of a nearly 90% loss of energy at each trophic level. Loss of energy is caused by such factors as heat loss

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from chemical reactions, energy lost as waste, and the fact that not all lower-level organisms are consumed by organisms at the next-highest level.

31. **B.**

Both prokaryotic cells and eukaryotic cells have cytoplasm. However, the cytoplasm in the prokaryote is granular and viscous, and the nuclear material floats freely without a nuclear membrane. Eukaryotes are indeed much larger than prokaryotes, but the latter has a much more primitive structure. Prokaryotes are unicellular and do not have distinct organelles.

32. **C.**

Phagocytes are special cells that ingest invasive microbes as part of the body's nonspecific immune response in the second line of defense against disease. The other answer choices are all part of the first line of defense.

33. **D.**

Acceleration is determined with the following equation:

$$\text{average acceleration} = \frac{\text{change in velocity}}{\text{time}}$$

$$a = \frac{v_2 - v_1}{t} = \frac{0 - 12 \text{ m/sec}}{36 \text{ sec}} = -0.334 \text{ m/sec}^2$$

34. **B.**

In this food pyramid, toads are secondary consumers that feed on the herbivore grasshoppers, which are primary consumers.

35. **B.**

The dotted line in the graph represents the point at which the habitat's carrying capacity is reached and population growth therefore levels out. Factors such as lack of competitors and frequency of reproduction would affect the carrying capacity of a habitat but are not specifically represented by the dotted line. Limiting factors (disease, predators, toxic environment, natural disasters, etc.) are those that prevent a population from growing to its biotic potential.

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36. **A.**

The Florida panther, with its drastically reduced numbers, was subject to the bottleneck effect. Population bottlenecks take place when a population's size is decreased for at least one generation. A reduced population must survive by inbreeding and is thus much more vulnerable to the effects of certain alleles than usual. This frequently results in genetic defects in the population. This is, in fact, what happened to the Florida panther. While it has avoided extinction, its population now has certain genetic defects including a hole in the heart.

37. **B.**

Substances that compete to attach to an enzyme's active site are called inhibitors. If they attach to the enzyme first, the cellular reaction (in this case the synthesis of prostaglandins) will not take place. A hormone is a specific chemical messenger used throughout the endocrine system. The COX-2 inhibitor is a molecule, not an ion. Prosthetic groups and cofactors are substances that work with enzymes to enhance certain reactions, whereas an inhibitor will limit the reaction.

38. **C.**

The fertilized ovum attaches to the endometrium, which is the inside wall of the uterus.

39. **B.**

Memory cells are a kind of T cell that is created when an antigen such as the chicken pox virus appears. Unlike plasma cells, which fight an antigen for about two weeks, memory cells remain in a person's system for a very long time, ready to reactivate immediately should the same antigen reappear. Memory cells are always specific to a pathogen, so an adult person who has never had a certain virus will not have memory cells in his or her system to attack that antigen. That person may, however, have memory cells keyed to another antigen.

40. **D.**

The cohesive properties of water are due to the hydrogen bonding between water molecules. This aids in capillary action, in which water moves upward in the narrow fibers of a plant or tree from the roots to the leaves. The ability of water to cool down and heat up slowly (A) is due to its high heat capacity, not its strong cohesion. Water floats as a solid (B) because it expands upon freezing. It is a universal solvent (C) because it is a highly polar molecule.

41. **B.**

Transpiration is part of the water cycle, and is the process by which plants release water vapor into the air.

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42. **B.**

Fermentation is an anaerobic process producing two ATP molecules per glucose molecule.

43. **C.**

The Krebs Cycle breaks down pyruvic acid molecules into CO_2 molecules, H^+ (protons), and 2 ATP molecules and liberates two electrons as the second step of cellular respiration.

44. **The correct answers are as follows:**

Independent Variable
Temperature (°C)

Dependent Variable
Rate of Reaction

45. **B.**

Various species of bacteria and fungi break excess nitrates back down into elements, a process that releases elemental nitrogen back into the air. This process is called denitrification. Ammonification and decomposition are both processes that break substances down but do not release nitrogen into the air. Nitrogen fixing makes nitrogen available to plant roots.

46. **D.**

As temperature increases, the reaction rate of an enzyme also increases. However, above an optimal temperature, the reaction rate decreases rapidly. This is because the enzyme molecules become altered as their hydrogen bonds begin to break. The enzyme then becomes "denatured," or incapable of fitting with its substrate and catalyzing the reaction. Choice (D) shows this situation, with the graph line peaking at 37° then falling off.

47. **B.**

Choice (B) shows the Sun/Earth/Moon alignment of the full moon. During a full moon, as during a new moon, the spring tide is in effect since the gravitational pull of the sun and moon work together in a 180° force to pull the tides into the highest tides of any time.

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48. **B.**

Sodium would be considered most highly reactive.

49. **D.**

Based on the data n the chart, it is a poor conclusion because the two gases have very different reactions.

50. **C.**

Density and phase measured physical properties in the table.

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