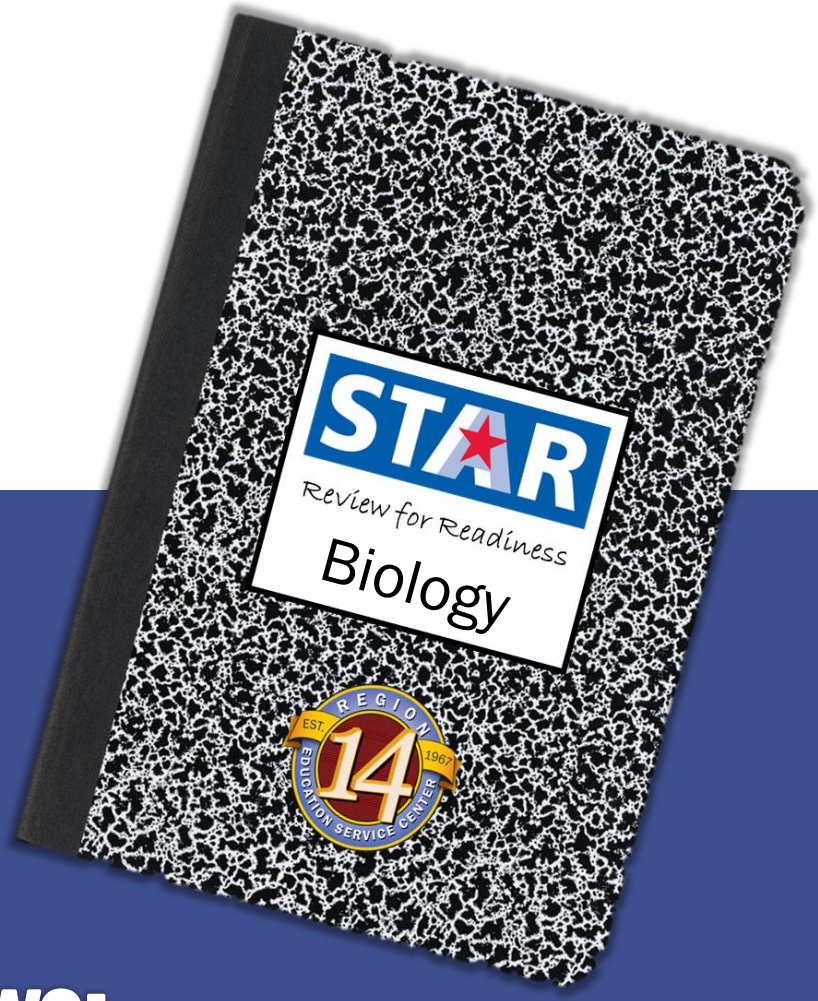
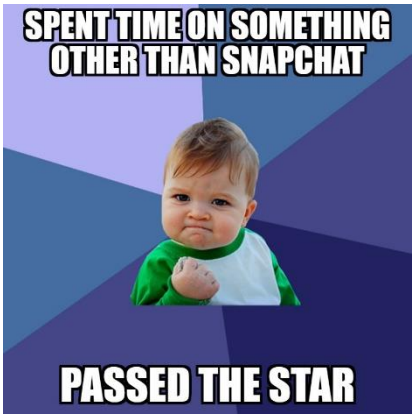


READYREVIEWS:
SMART REVIEW STRATEGIES

BIOLOGY
EOC

2017 Edition

Region 14
Education Service Center
Abilene, Texas



Reading this guide without working in it might help you some, but you will need to work through most of this guide while in class in order to have a document to study for the test.

The STAAR Grade 8 Science test is challenging, but it is still just a multiple-choice test, and suffers from the same weaknesses in test construction that all multiple-choice tests have. Learn how to look for these weaknesses and use them to your advantage. All it takes is some time to understand the test, and understand some science. With a little preparation, and patience, you can pass suing these steps.

Contents

1

Get a Game Plan for Success on STAAR Science

Passing this test starts with knowing what it takes to pass it. This guide lays out how to study the least amount of stuff in order to pass, to take the test in a way that keeps it from freaking you out, and to let you know if you've passed before you leave the room. This section of the guide is important since it details how to take the test.

2

Get "Ready" through the Readiness Standards

Knowing about the test is a start, but you need to know some science as well. This section will give you a chance to focus on your areas of weakness, while helping you see how the tests is designed to confuse and frustrate unprepared test takers. Know the vocabulary, know the science, and know how its tested by working through sample problem, reviewing the vocabulary, and brushing up on content.

READYREVIEWS: SMART REVIEW STRATEGIES

GETTING A GAME PLAN FOR SUCCESS ON THE BIOLOGY END-OF-COURSE

1

Region 14
Education Service Center
Abilene, Texas

What does it take to pass?

What if I told you We have to Guess?

Each year test makers adjust the number of questions you have to get correct to pass the test. They call it "standardizing a scale score." It means that neither you, me, or your teachers know what it takes to pass until after we get the scores back. This is something neither you, me, nor your teachers would ever get away with in the real world. Luckily, the number fluctuates but not much, and so we can make a pretty good guess based on previous tests. Here's how...

1. We start with where we think "passing" will be.

Looking at previous tests let us know a "raw score," or the approximate number of questions you will have to get correct.

Approaches Grade Level (I want to Pass This)	Meets Grade Level (I Got This)	Masters Grade Level (I want to Ace This)
22 Scored Items	33 Scored Items	45 Scored Items

2. Add the field test items

There are some items you will take on the test that are not scored. These "field test Items" don't hurt your score, but they don't help it and you can't tell which are field test and which aren't. Probably it's best just to act like they are part of the test. FIELD TEST ITEMS ARE NOT PART OF RETESTS. So if you are taking the Biology EOC over, don't include these in your total, just use the number above.

8 Field Test Items	8 Field Test Items	8 Field Test Items

3. Come up with a good guess...

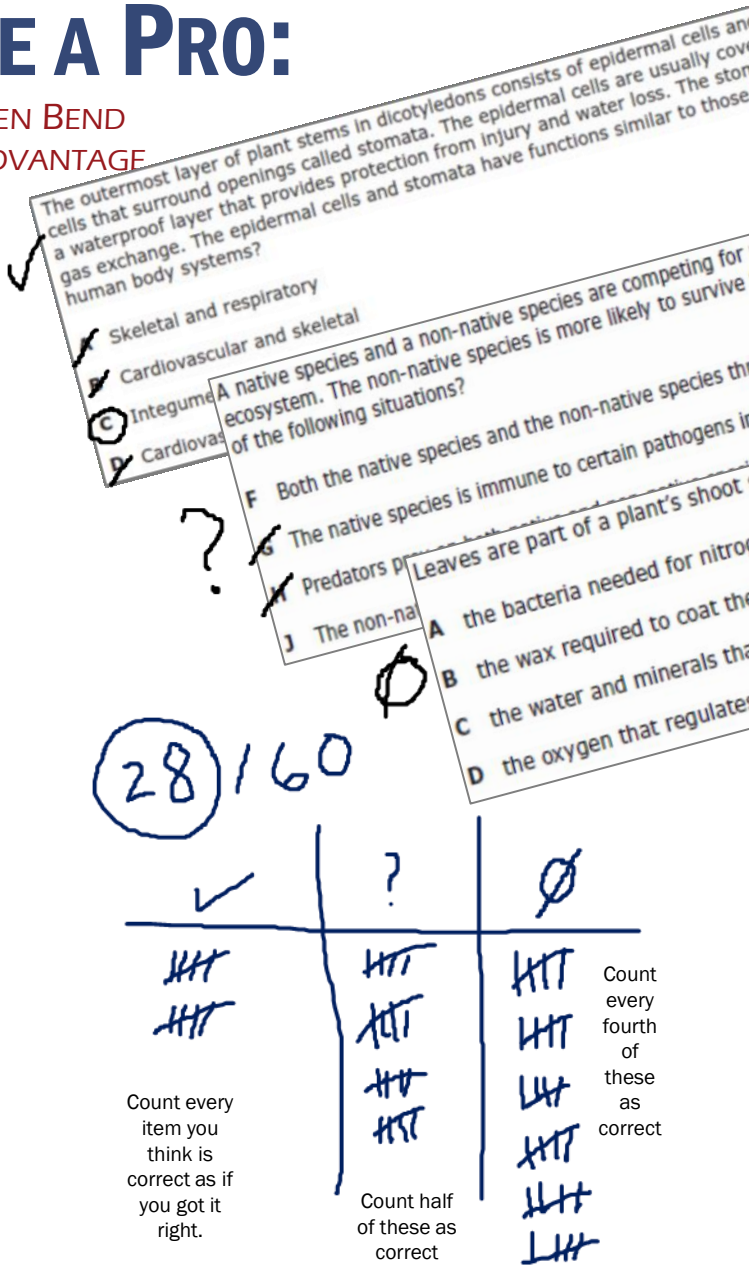
This is how many questions you want to make sure you have right before you finish the test.

30 Correct (48%)	41 Correct (66%)	53 Correct (85%)

How to Test Like a Pro:

We don't Break Rules, We Don't Even Bend 'em, But we Can Use them to Our Advantage

1. **"Ask for the upgrades, Dude."** There's a bunch of things you can use on the test, but you have to ask for them. So get plenty of scratch paper, highlighters, and maybe even notecards.
2. **"Put. The. Answersheet. Aside"**. Never put a mark on an answer sheet until you finish the test. Test makers count erasure marks and if you have too many of them they might accuse you of cheating. Work everything on scratch paper or in a test booklet.
3. **"Brain Dumps are essential."** When the test administrator says "you may begin. Begin a brain dump…Write down anything you are having trouble remembering.
4. **You gotta "keep score."** Mark a scratch sheet to keep track of your "magic number, and how you are doing on the test. Use a system like the example to the right.
5. **"You ain't going nowhere soon"** Be prepared to work through the test 3 times. The first time you will answer every question. Take a small break, then begin to work through the test, working on ONLY those you have narrowed to 2 possible choices. Then take a break and work through the test a third time trying to narrow those you don't know to 2 or so choices before guessing.
6. **"Strategy only gets you so far"** you have to study for this test. If you didn't have to study, this would be the only page in the study guide!



- Taking a test isn't a fashion show… dress comfortable.
- Donuts are great, but not on test day. You need some protein. So eat breakfast. But if it's nothing more than sugar you crash before you finish the test.
- Relax. And stay relaxed. The dudes that make this test want you to freak out because you make more mistakes then, and keep them in a job…

What should I study?

What if I told you that we have to figure that out … and quick?

Don't open the Science textbook up to page one, and start going through stuff. It will only frustrate you and it will waste your time. Know a little bit about the test's construction and make life easier on you….

1.

Don't study everything

The STAAR test is not constructed with equal numbers of questions for everything you've studied this year. Some things are tested more often. The Charts on the following pages show the TEKS that are part of the STAAR test, and how many questions show up each year.. Don't study anything that's not in a block that's going to help you… its not worth your time by now. And make sure you focus on the most important ones

2.

"Get READY" with the Essentials

The TEKS in the top sections on the charts are important. If you could get all the questions that test those concepts correct you would easily pass, Make sure you know them. Pick those you struggle with and really work on them till you have them down.

This guide includes practice to help you do this.

3.

Study other material as Time Allows

So you are like "down with the science thing"? You have gone through the "approaches" and "meets" boxes and are good to go? Then time to go for Masters. And to do that you will need to work through most of TEKS. This guide does not provide all the info you will need for that, but your teacher can help you with anything you might need.

Want some help with understanding This?
Use the QR code or go to:
https://youtu.be/S_nQJU-xTh4

THE ESSENTIAL 5

WORK THE MOST ON THE TEKS BELOW YOU ARE WEAKEST IN, BUT KNOW ALL OF THESE: (12-13 QUESTIONS)

TEKS	Appx. Questions	G2G?	Description
B.06A	2.2	YES / NO	identify components of DNA, and describe how information for specifying the traits of an organism is carried in the DN
B.08B	2.2	YES / NO	categorize organisms using a hierarchical classification system based on similarities and differences shared among groups
8.10A	2.8	YES / NO	describe the interactions that occur among systems that perform the functions of regulation, nutrient absorption, reproduction, and defense from injury or illness in animals
B.10B	3.0	YES / NO	describe the interactions that occur among systems that perform the functions of transport, reproduction, and response in plants
B.12A	2.2	YES / NO	interpret relationships, including predation, parasitism, commensalism, mutualism, and competition among organisms

THE PICK 6

SELECT 6 OF THE TEKS FROM BELOW THAT YOU ARE STRONGEST IN AND WORK ON THEM: (2 QUESTIONS EACH).

TEKS	Appx. Questions	G2G?	Description
B.04B	2.0	YES / NO	investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules
B.04C	2.0	YES / NO	compare the structures of viruses to cells, describe viral reproduction, and describe the role of viruses in causing diseases such as human
B.05A	2.0	YES / NO	describe the stages of the cell cycle, including deoxyribonucleic acid (DNA) replication and mitosis, and the importance of the cell cycle to the growth of organisms
B.06E	2.0	YES / NO	identify and illustrate changes in DNA and evaluate the significance of these changes
B.06F	2.0	YES / NO	predict possible outcomes of various genetic combinations such as monohybrid crosses, dihybrid crosses and non-Mendelian inheritance
B.07A	2.0	YES / NO	analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies, including anatomical, molecular, and developmental
B.07E	2.0	YES / NO	analyze and evaluate the relationship of natural selection to adaptation and to the development of diversity in and among species
B.09A	2.0	YES / NO	compare the structures and functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids
B.12C	2.0	YES / NO	analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids
B.12F	2.0	YES / NO	describe how environmental change can impact ecosystem stability

MY PAGE TOTAL = _____/11.4 (APPROACHES > 7.5, MEETS >, MASTER >)

Meets Grade Level

The Essential 15
32-33 Questions

You need to be solid in ALL of the TEKS listed on the previous page, since each is heavily tested each year (Don't Just Pick 6, Know ALL of them)

Masters Grade Level

Always There

In addition to the Essential 15 above, Cover these in order (top to bottom) These will be on the test (12-13 Questions)

TEKS	Qs	G2G?	Description
B.11D		YES / NO	describe how events and processes that occur during ecological succession can change populations and species diversity
B.09C		YES / NO	identify and investigate the role of enzymes
B.11A		YES / NO	describe the role of internal feedback mechanisms in the maintenance of homeostasis
B.06C		YES / NO	explain the purpose and process of transcription and translation using models of DNA and RNA
B.10C		YES / NO	analyze the levels of organization in biological systems and relate the levels to each other and to the whole system
B.06B		YES / NO	recognize that components that make up the genetic code are common to all organisms
B.06G		YES / NO	recognize the significance of meiosis to sexual reproduction
B.06H		YES / NO	describe how techniques such as DNA fingerprinting, genetic modifications, and chromosomal analysis are used to study the genomes of organisms
B.07B		YES / NO	analyze and evaluate scientific explanations concerning any data of sudden appearance, stasis, and sequential nature of groups in the fossil record
B.09B		YES / NO	compare the reactants and products of photosynthesis and cellular respiration in terms of energy and matter

My Page Total = _____/10.7
(Approaches > 5.3, Meets = 10.7)

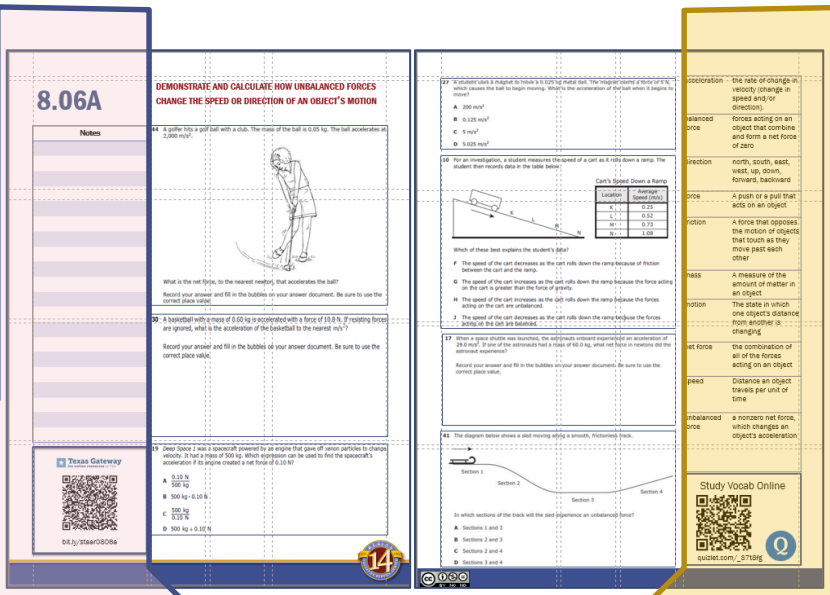
If Time Allows

These sometimes appear on the test, (8-9 Questions)

TEKS	Qs	G2G?	Description
B.04A		YES / NO	compare and contrast prokaryotic and eukaryotic cells
B.05B		YES / NO	examine specialized cells, including roots, stems, and leaves of plants; and animal cells such as blood, muscle, and epithelium
B.05D		YES / NO	recognize that disruptions of the cell cycle lead to diseases such as cancer
B.07F		YES / NO	analyze and evaluate the effects of other evolutionary mechanisms, including genetic drift, gene flow, mutation, and recombination
B.08A		YES / NO	define taxonomy and recognize the importance of a standardized taxonomic system to the scientific community
B.08C		YES / NO	compare characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, plants, and animals
B.11C		YES / NO	summarize the role of microorganisms in both maintaining and disrupting the health of both organisms and ecosystems
B.12B		YES / NO	compare variations and adaptations of organisms in different ecosystems
B.12E		YES / NO	describe the flow of matter through the carbon and nitrogen cycles and explain the consequences of disrupting these cycles
B.05C		YES / NO	describe the roles of DNA, ribonucleic acid (RNA), and environmental factors in cell differentiation
B.06D		YES / NO	recognize that gene expression is a regulated process
B.11B		YES / NO	investigate and analyze how organisms, populations, and communities respond to external factors

USING THIS STUDY GUIDE

BYOD … BYOB (BRING YOUR OWN DEVICE… BRING YOUR OWN BRAIN)



READ AND REVIEW VIA TEXAS GATEWAY

Complete on-line lessons await for each student expectation. They include text, videos, and interactive exercises to quickly review the content. Take notes over what's important, where you can quickly look over it before taking the test.

WORK WITH RELEASE ITEMS

These items show the variety and challenging content from previously released STAAR exams. Don't just get the right answers, but think about what you had to do to determine the right answers, and what makes these items easy/ hard.

PRACTICE YOUR VOCABULARY

Cover up the definitions and quiz yourself. Use these to help you work through the sample items. Quiz yourself on-line using the link. These are the essential vocabulary to know before sitting to test.

USING QR CODES.

Typing the shortened URLs for each vocab and lesson gets old. If your device has a camera, download a QR code reader, scan the black and white image, and let it link you to the resource. Quicker, easier, and convenient, huh?

Notes

READYREVIEWS: SMART REVIEW STRATEGIES

GETTING "READY" THROUGH THE READINESS STANDARDS

2

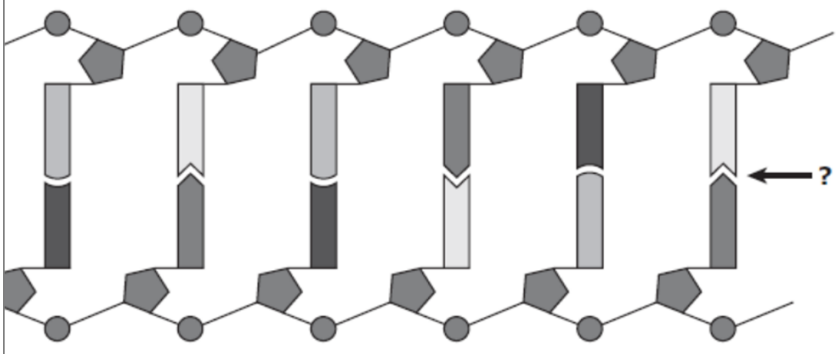
Region 14
Education Service Center
Abilene, Texas

B.06A

IDENTIFY COMPONENTS OF DNA, AND DESCRIBE HOW INFORMATION FOR SPECIFYING THE TRAITS OF AN ORGANISM IS CARRIED IN THE DNA

Notes

A model of a DNA molecule is shown below.



The arrow indicates —

F the bond between adjacent phosphate and deoxyribose molecules

G the junction of introns and exons in the sense strand of DNA

H the hydrogen bond between complementary nucleotides

J the junction of a codon and a DNA triplet

Components of DNA:
https://youtu.be/4mpkbcyO3xA

Traits and DNA:
https://youtu.be/s13wDSqK2mw

DNA and the Central Dogma:
https://youtu.be/C5FvMgOY4mA

The sequence of nitrogenous bases in DNA varies widely. The sequence of the bases in DNA is most important for which of the following?

A Providing the instructions for the traits of an organism

B Preventing mutations from occurring during DNA replication

C Allowing the DNA to have the shape necessary for replication

D Helping form the sugar-phosphate backbone of DNA molecules

Characteristics such as a widow's peak or attached earlobes are determined by the genetic code. Which components of DNA are referred to as the genetic code?

F Phosphate groups

G Nitrogenous bases

H Deoxyribose sugars

J Hydrogen bonds

How does DNA in cells determine an organism's complex traits?

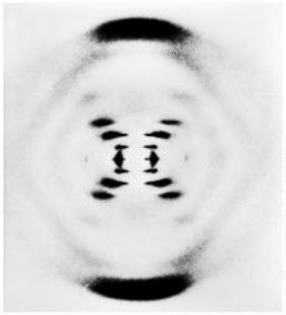
A DNA contains codes for proteins, which are necessary for the growth and functioning of an organism.

B DNA separates into long single strands that make up each part of an organism.

C DNA produces the energy an organism needs in order to grow.

D DNA folds into the nucleus of each of the cells of an organism.

In 1952 Rosalind Franklin took the x-ray photograph shown below, which gave the world its first look at DNA.



By studying this photograph, scientists gained knowledge about the —

F role of DNA in protein synthesis

G mutation of nucleotide sequences in DNA

H sequence of DNA that makes up the human genome

J double-helix structure of DNA

Notes

adenines
amino acid
cytosine
double helix
genetic code
guanine
hydrogen bond
nitrogenous base
nucleotide
phosphates
polypeptide chain
thymine
uracil
chromosomes
deoxyribose
DNA (deoxyribonucleic acid)
protein(s)
RNA
traits

B.08B

CATEGORIZE ORGANISMS USING A HIERARCHICAL CLASSIFICATION SYSTEM BASED ON SIMILARITIES AND DIFFERENCES SHARED AMONG GROUPS

Notes

19 A student collected the animal shown below on a field trip. The student used a dichotomous key and a microscope to classify the animal.

Dichotomous Key

Step	Characteristic	Identification
1a	Possesses segmentation	Go to 2
1b	Lacks segmentation	Go to 3
2a	Has an exoskeleton with jointed appendages	Phylum Arthropoda
2b	Has no exoskeleton, unjointed appendages (if any present), and a segmented worm-like body; is possibly in a tube (if in a tube, may have tentacles)	Phylum Annelida
3a	Possesses a foot, a radula, arms, and/or a shell	Phylum Mollusca
3b	Lacks all of the above and is dorsoventrally flattened	Phylum Platyhelminthes

How should this animal be classified?

A Arthropoda

B Annelida

C Mollusca

D Platyhelminthes

Classification Systems:
https://youtu.be/WKdbdAqvtHg

Using a light microscope, a student identified the following characteristics of four organisms found in a sample of pond water.

Pond-Water Organisms

Organism 1	Single-celled, nucleus, large vacuole
Organism 2	Single-celled, no nucleus, cell wall
Organism 3	Single-celled, no nucleus
Organism 4	Single-celled, nucleus

Based on the observations of the student, which organisms most likely belong to the taxonomic group for bacteria?

A Organisms 1 and 2

B Organisms 3 and 4

C Organisms 1 and 4

D Organisms 2 and 3

Arthropods are joint-legged animals. Spiders, crabs, pill bugs, centipedes, and millipedes are examples of the many types of arthropods. Which of these arthropods are most closely related?

F Arthropods of the same family

G Arthropods of the same class

H Arthropods of the same genus

J Arthropods of the same species

4 The diagram shows a dichotomous key and a picture of a fruit.

Key to Some Winged Fruits

1a	Fruit with a single wing	Go to 2
1b	Fruit with a pair of wings	Go to 3
2a	Fruit with a very narrow lance shape, about 7 times longer than it is wide	*Fraxinus americana*
2b	Fruit with a wide lance shape, about 4 times longer than it is wide	*Fraxinus nigra*
3a	Fruit that forms a very wide angle, almost a straight line	*Acer platanoides*
3b	Fruit that forms an acute angle, almost a V shape	*Acer negundo*

According to the key, the fruit comes from which species of tree?

F *Fraxinus americana*

G *Fraxinus nigra*

H *Acer platanoides*

J *Acer negundo*

Notes

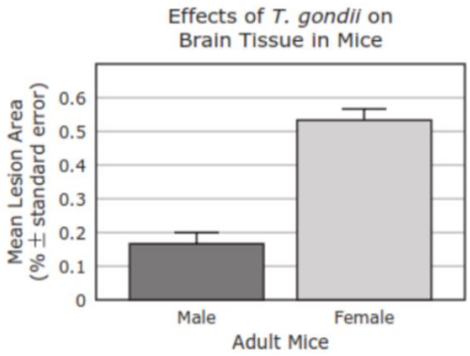
hierarchical classification system
taxonomic group
taxonomic system
animals
archaea
autotroph
bacteria
characteristics
cladogram
Class
classify
dichotomous key
domain
family fungi
genus
heterotroph
kingdom
order
phylum
Plants
protists
species

B.10A

DESCRIBE THE INTERACTIONS THAT OCCUR AMONG SYSTEMS THAT PERFORM THE FUNCTIONS OF REGULATION, NUTRIENT ABSORPTION, REPRODUCTION, AND DEFENSE FROM INJURY OR ILLNESS IN ANIMALS.

Notes

Toxoplasmosis is an infection producing brain lesions caused by the parasitic protozoan *Toxoplasma gondii*. Mice with their gonads removed are more resistant to *T. gondii* and develop very few lesions on their brain tissue. The graph shows the results of a scientific study of normal adult mice infected with *T. gondii*.



Which systems most likely interact and cause the severity of infections to vary?

F Muscular and skeletal

G Immune and endocrine

H Excretory and respiratory

J Nervous and integumentary

Texas Gateway for online resources by TEA

https://goo.gl/fnyaue

What two human systems work together to provide body cells with a constant supply of oxygen while removing carbon dioxide waste products?

A Nervous and endocrine

B Muscular and skeletal

C Respiratory and circulatory

D Excretory and integumentary

When a person is suddenly cut by a sharp object, a nervous impulse is sent along a sensory neuron to the spinal cord. The impulse is immediately transmitted through motor neurons to produce a response. Which of the following correctly identifies and describes this response?

F It is a conditioned response that occurs only to prevent injury.

G It is a learned response that does not occur in infants and small children.

H It is a reflex response that causes various muscles to contract in order to move away from the object.

J It is a voluntary response that is initiated only after the impulse has been carried to the relevant area in the brain.

Health-care workers are exposed to many different types of pathogenic and nonpathogenic microorganisms. Which body systems work together to protect the body from pathogens?

A Muscular and vascular

B Digestive and excretory

C Circulatory and immune

D Endocrine and reproductive

Which of the following correctly describes an interaction that occurs between two body systems of a rabbit that helps the rabbit outrun a pursuing coyote?

F The skeletal system releases additional calcium, and the circulatory system retains more sodium in the blood to provide muscles with ions for contraction.

G The digestive system increases the rate of digestion, and the excretory system ceases to provide tissues with more nutrients.

H The respiratory system increases the breathing rate, and the circulatory system increases blood pressure to provide tissues with more oxygen.

J The endocrine system releases hormones that prepare the immune system to deal with possible injuries.

Notes

feedback loop
homeostasis
immune system
lymphatic system
nutrient
absorption
pathogen
Regulation
circulatory system
defense
digestive system
endocrine system
excretory system
Illness
integumentary system
interactions
immune system
muscular system
nervous system
reproduction
reproductive system
respiratory system
skeletal system
systems [body]

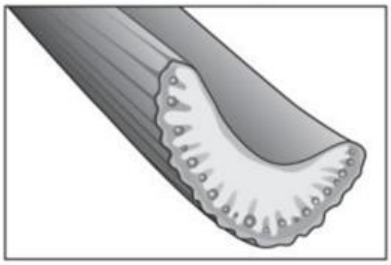
B.10B

Describe the interactions that occur among systems that perform the functions of transport, reproduction, and response in plants.

Notes

Some students are instructed to put a celery stalk in a red dye solution for a lab activity. First the students carefully cut the bottom of the stalk with a scalpel. Then they put the stalk in the beaker with the solution and place the beaker on a shelf in the lab room. The next day they check the stalk and make observations. The students note that the leaves at the end of the stalk have changed color from green to red. The students cut across the celery stalk and use a hand lens to see that the small tube openings along the edge of the celery stalk are also red. The cross section is shown below.

Cross Section of a Celery Stalk



How do the plant systems work together to make this movement of liquid possible?

F The roots absorb water and minerals and move them up to the stem, while the stem moves food produced in the leaves down to the roots in tiny tubes.

G The roots anchor the plant in the soil, and the stem holds the leaves up.

H The roots absorb their own water and minerals, while the stem absorbs its water and minerals through the leaves.

J The roots lose water vapor to the soil, and the stem loses water vapor through the leaves.

The outermost layer of plant stems in dicotyledons consists of epidermal cells and guard cells that surround openings called stomata. The epidermal cells are usually covered with a waterproof layer that provides protection from injury and water loss. The stomata allow gas exchange. The epidermal cells and stomata have functions similar to those of which two human body systems?

A Skeletal and respiratory

B Cardiovascular and skeletal

C Integumentary and respiratory

D Cardiovascular and integumentary

Plant hormones serve as chemical messengers between cells and tissues. Auxin is a plant hormone that causes the cells on the shady side of a plant shoot to elongate. The response enabled by auxin is known as —

F geotropism

G transpiration

H phototropism

J photosynthesis

Leaves are part of a plant's shoot system. The xylem tissue in leaves transports —

A the bacteria needed for nitrogen fixation in root nodules

B the wax required to coat the surface of actively growing tissue

C the water and minerals that are absorbed by the roots

D the oxygen that regulates the rate of carbohydrate production

Copper is a micronutrient that can be found in soil. Copper is important for reproductive growth in plants and plays an indirect role in chlorophyll production. Which statement correctly describes the interaction that occurs between the root and the shoot systems of plants to allow reproduction to occur?

F Copper is produced in the roots when copper-containing compounds are hydrolyzed.

G Copper that is absorbed by the roots is transported to reproductive tissues by the shoot system.

H The shoot system stores copper for later use by the roots and the reproductive structures.

J The shoot system transports copper to the roots after it is taken in through stomata in the leaves.

Notes

cuticle geotropism
guard cell
mesophyll cell
phloem
phototropism
pith stoma
thigmotropism
xylem
cellular reproduction
dermal system
reproduction
reproductive system
response
roots
shoots
stem
systems
transpiration
transport
vascular system

B.12A

Interpret relationships, including predation, parasitism, commensalism, mutualism, and competition among organisms

Notes

34 Brazil nuts (*Bertholletia excelsa*) are tall canopy trees that make up a large portion of the Amazon rain forest. They produce large grapefruit-sized seedpods. The agouti, a ground-dwelling rodent, has teeth strong enough to open the tough seedpods. While the agouti eats some of the tree's seeds, it also buries caches in various spots on the rain forest floor.

Why is the agouti important to the rain forest ecosystem?

F It eats and disperses the trees' seeds.

G It eats the trees' excess seeds and prevents other animals from doing so.

H It cleans the rain forest floor of debris, allowing for easier motility.

J It prevents the trees' seeds from rotting on the rain forest floor.

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https://goo.gl/LnE1Zr

3 In any environment or ecosystem, organisms can have several different types of relationships. Three types of relationships are described below.

Ecological Relationships

Relationship	Description
X	Barnacles (small crustaceans) adhere to the skin of a whale in order to be deposited in a new location that is abundant in resources. The whale does not appear to be affected.
Y	Fleas attach to the skin of warm-blooded animals, feed on their blood, and make the animals itch.
Z	Fungal mycorrhizae live on plant roots and increase the plant's ability to absorb nutrients. The mycorrhizae are provided with carbohydrates from the plant.

Which of these correctly describes the relationships between the organisms?

A X: mutualism
Y: parasitism
Z: commensalism

B X: commensalism
Y: mutualism
Z: parasitism

C X: parasitism
Y: commensalism
Z: mutualism

D X: commensalism
Y: parasitism
Z: mutualism

A native species and a non-native species are competing for resources within the same ecosystem. The non-native species is more likely to survive than the native species in which of the following situations?

F Both the native species and the non-native species thrive on the same food source.

G The native species is immune to certain pathogens in the ecosystem.

H Predators prey on both native and non-native species.

J The non-native species has no natural enemies in the ecosystem.

Notes

competition for resources
symbiotic relationship
commensalism
parasitism
predation
mutualism

Notes

READYREVIEWS: SMART REVIEW STRATEGIES

THE "PICK 6" TEKS

3

Region 14
Education Service Center
Abilene, Texas

B.09A

COMPARE THE STRUCTURES AND FUNCTIONS OF DIFFERENT TYPES OF BIOMOLECULES, INCLUDING CARBOHYDRATES, LIPIDS, PROTEINS, AND NUCLEIC ACIDS

Notes

Carbohydrates are more easily metabolized than lipids. However, on a gram-for-gram basis lipids provide cells with more —

F nitrogen

G proteins

H structure

J energy

Which of the following biomolecules typically contains both nitrogen and phosphate?

F Lipid

G Protein

H Nucleic acid

J Carbohydrate

Proteins and polysaccharides are polymers. These polymers are formed by dehydration synthesis. Which statement correctly identifies a difference in the structure of proteins and polysaccharides?

F Only polysaccharides are comprised of repeating units of cytosine, adenine, guanine, and thymine.

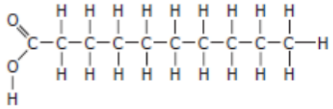
G Only proteins are formed from amino acids joined by peptide bonds.

H Only polysaccharides can be folded and twisted to very specific shapes.

J Only proteins can be large molecules with thousands of subunits.

Which of these best represents a fatty-acid molecule?

F



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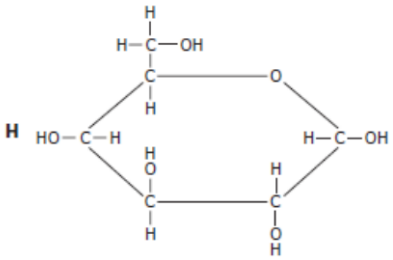

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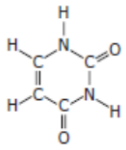

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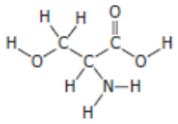
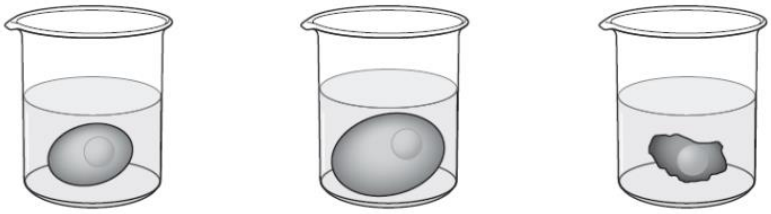


B.04B

INVESTIGATE AND EXPLAIN CELLULAR PROCESSES, INCLUDING HOMEOSTASIS, ENERGY CONVERSIONS, TRANSPORT OF MOLECULES, AND SYNTHESIS OF NEW MOLECULES

37 Some students used vinegar to dissolve away the shells of three eggs and used these eggs as models of human red blood cells. The students observed the changes in the eggs when they were placed in different solutions.

Red Blood Cell Model in Different Solutions



300 mL of 5% vinegar solution | 300 mL of pure water | 300 mL of corn syrup solution

Which statement best describes the role of the cell membrane in this model?

A The cell membrane is an impermeable barrier that prevents water from entering the cell.

B The cell membrane allows solutes to enter the cell, which causes the cell to shrink.

C The cell membrane allows water to enter and leave the cell.

D The cell membrane removes solutes from the environment.

27 Which group of organelles is directly responsible for the production of new molecules within a cell?

A Ribosomes, the endoplasmic reticulum, and Golgi apparatuses

B Golgi apparatuses, lysosomes, and the plasma membrane

C The endoplasmic reticulum, plastids, and vacuoles

D The nucleolus, vacuoles, and ribosomes

33 The cellular process known as the sodium-potassium pump was discovered in the 1950s by Jens Christian Skou, a Danish scientist. This process is a form of active transport that moves three sodium ions to the outside of a cell for every two potassium ions that it moves into the cell. Which of these best explains why energy is needed for active transport?

A Ions are negatively charged.

B Ions are attached to large proteins.

C Ions are trapped inside the plasma membrane.

D Ions are moved against the concentration gradient.

Notes

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https://goo.gl/wgtJ3N (photosynthesis)

https://goo.gl/g1r9dH (cell respiration)

https://goo.gl/6v9rhK (fermentation)

B.04C

COMPARE THE STRUCTURES OF VIRUSES TO CELLS, DESCRIBE VIRAL REPRODUCTION, AND DESCRIBE THE ROLE OF VIRUSES IN CAUSING DISEASES SUCH AS HUMAN IMMUNODEFICIENCY VIRUS (HIV) AND INFLUENZA

Notes

A person infected with the human immunodeficiency virus (HIV) may not have any symptoms for a period of time. During this period the virus affects the body by doing which of the following?

A The virus produces toxins that weaken immune cells and prevent them from reproducing.

B The virus damages immune cells while using their machinery to produce copies of itself.

C The virus uses nutrients meant for immune cells to fuel its own cellular respiration.

D The virus changes the identity of the nucleotides of immune cells to prevent the immune system from functioning normally.

Severe acute respiratory syndrome (SARS) is an illness caused by a coronavirus. Symptoms including a high fever, headaches, and body aches typically occur two to seven days after infection by the virus. SARS is more serious in elderly patients. This information suggests that the reproductive cycle of the SARS virus is —

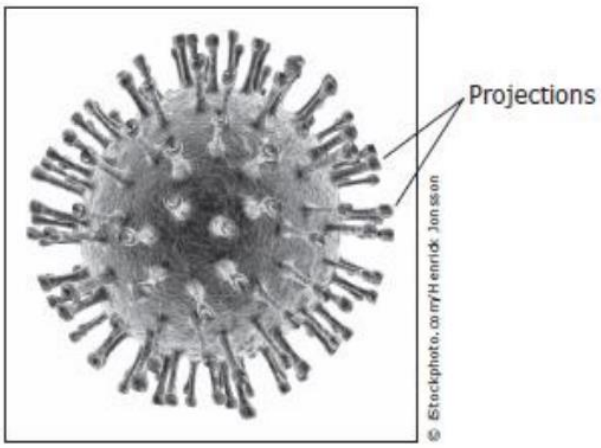
A lysogenic, because the virus is a coronavirus

B lytic, because the virus causes respiratory illness

C lysogenic, because the virus primarily affects older people

D lytic, because of the quick onset of symptoms after infection

A photograph of a virus is shown below.



The projections on the surface of this virus allow the virus to —

A move inside a host cell

B attach to a host cell

C control a host cell's DNA

D signal other viruses to infect a host cell

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https://goo.gl/bpxEsl
(diseases)

https://goo.gl/bpxEsl
(reproduction)

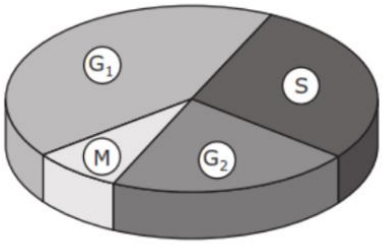
https://goo.gl/lyG5gN
(structure)

B.05A

DESCRIBE THE STAGES OF THE CELL CYCLE, INCLUDING DEOXYRIBONUCLEIC ACID (DNA) REPLICATION AND MITOSIS, AND THE IMPORTANCE OF THE CELL CYCLE TO THE GROWTH OF ORGANISMS

Notes

Checkpoints occur between the stages of the cell cycle. If a cell does not meet certain criteria at the end of a stage, it will not move to the next stage.



Which of these occurs just before the cell enters the G_2 stage of the cell cycle?

F The nuclear membrane disintegrates.

G DNA replicates.

H Centrioles form.

J The nucleolus divides.

A photomicrograph of onion root tip cells during mitosis is shown below.

Which phase of mitosis is occurring in the cell indicated by the arrow?

F Prophase

G Metaphase

H Anaphase

J Telophase

Which of these must occur during S phase of the cell cycle so that two daughter cells can be produced during M phase?

A The DNA must be replicated.

B The chromosomes must be joined.

C The cytoplasm must be separated.

D The cell membrane must be expanded.

B.06E

IDENTIFY AND ILLUSTRATE CHANGES IN DNA AND EVALUATE THE SIGNIFICANCE OF THESE CHANGES

Early-onset Alzheimer's disease affects people under the age of 65. Less than five percent of people who are diagnosed with Alzheimer's disease have this type. Many cases of early-onset Alzheimer's disease are inherited, a type known as familial Alzheimer's disease (FAD). Which statement is best supported by this information?

F FAD is the result of a genetic change in one or more chromosomes.

G Natural selection will continue to reduce the incidence of FAD.

H FAD affects only the genes of middle-aged people.

J Deletion of one amino acid causes FAD.

Sickle-shaped red blood cells result from a mutation in the gene that codes for hemoglobin. This mutation results in sickle-cell anemia. A partial sequence of bases from a normal hemoglobin gene and a sequence that results in sickle-cell anemia are shown below.

Normal hemoglobin:	T-G-A-G-G-T-C-T-C-C-T-C
Sickle-cell hemoglobin:	T-G-A-G-G-T-C-A-C-C-T-C

What type of mutation is depicted in this sequence?

A Substitution

B Insertion

C Deletion

D Frameshift

A codon chart is shown below.

First Letter	Second Letter: U	Second Letter: C	Second Letter: A	Second Letter: G	Third Letter
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	(STOP)	(STOP)	A
	Leucine	Serine	(STOP)	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	Isoleucine	Threonine	Asparagine	Serine	U
	Isoleucine	Threonine	Asparagine	Serine	C
	Isoleucine	Threonine	Lysine	Arginine	A
	Methionine (START)	Threonine	Lysine	Arginine	G
G	Valine	Alanine	Aspartate	Glycine	U
	Valine	Alanine	Aspartate	Glycine	C
	Valine	Alanine	Glutamate	Glycine	A
	Valine	Alanine	Glutamate	Glycine	G

Which of these changes to the DNA triplet 3' GCT 5' will affect the protein produced?

A GTT

B TCT

C TCC

D GCA

Notes

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bit.ly/staar0811a

B.06F

PREDICT POSSIBLE OUTCOMES OF VARIOUS GENETIC COMBINATIONS SUCH AS MONOHYBRID CROSSES, DIHYBRID CROSSES AND NON-MENDELIAN INHERITANCE

Notes

In the 1860s Gregor Mendel performed numerous dihybrid crosses between pea plants. Dihybrid crosses involve the study of the inheritance patterns related to two different traits. In guinea pigs the allele for black fur (B) is dominant over the allele for brown fur (b), and the allele for short fur (F) is dominant over the allele for long fur (f). What percentage of the offspring from a BbFf x bbff cross would be expected to be heterozygous for both traits?

F 0%

G 25%

H 50%

J 100%

Tomato plants usually have hairy stems. Hairless stems are present in tomato plants that are homozygous recessive for this trait. If the stem characteristics are determined by a single gene, what is the expected outcome of crossing two tomato plants that are heterozygous for hairy stems?

A 75% hairy stems: 25% hairless stems

B 100% hairy stems

C 100% hairless stems

D 50% hairy stems: 50% hairless stems

If several pea plants with the genotype TTYy are crossed with pea plants with the genotype Ttyy, what percentage of the offspring will be expected to have the TTYy allele combination?

A 25%

B 40%

C 50%

D 75%

In cocker spaniels the allele for a black coat color (B) is dominant over the allele for a brown coat color (b). If a brown cocker spaniel is crossed with a heterozygous black cocker spaniel, which of the following genotypic ratios can be expected?

F 0 BB: 2 Bb: 2 bb

G 1 BB: 2 Bb: 1 bb

H 2 BB: 0 Bb: 2 bb

J 2 BB: 1 Bb: 0 bb

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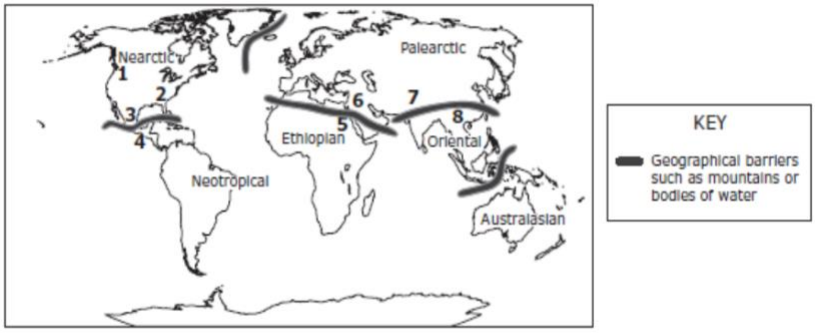
B.07A

ANALYZE AND EVALUATE HOW EVIDENCE OF COMMON ANCESTRY AMONG GROUPS IS PROVIDED BY THE FOSSIL RECORD, BIOGEOGRAPHY, AND HOMOLOGIES, INCLUDING ANATOMICAL, MOLECULAR, AND DEVELOPMENTAL

5 Zoogeographic regions are characterized by the presence of specific groups of animals. These regions are determined by the taxonomic or phylogenetic relationships of animals. The map shows the zoogeographic regions proposed by the naturalist Alfred Russel Wallace in 1876.

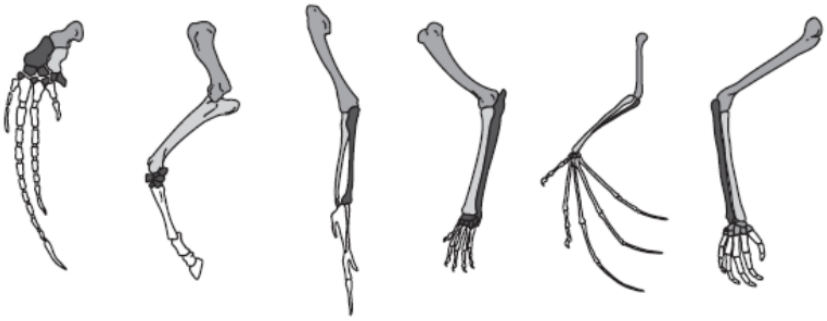
Zoogeographic Regions



The similarities of organisms in which two areas numbered above provide the best evidence for common ancestry between the organisms in both locations?

A 1 and 2
B 3 and 4
C 5 and 6
D 7 and 8

2 The limbs of several organisms are shown in the illustrations below. Scientists sometimes compare the limbs of these organisms to look for evidence of common ancestry.



Whale Horse Bird Cat Bat Human

These limbs provide evidence of common ancestry because they —

F have the same basic structure
G perform the same function
H are the same size
J are parts of mammals

Notes

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https://goo.gl/Pf5vRf

B.07E

ANALYZE AND EVALUATE THE RELATIONSHIP OF NATURAL SELECTION TO ADAPTATION AND TO THE DEVELOPMENT OF DIVERSITY IN AND AMONG SPECIES

Notes

Scientists estimate that there are more than 20,000 species of ants. The species range in size from 1 mm long to 38 mm long and live in most environments. The diets of ants range from flowers and seeds to fluids from their own larvae. Ants have been able to successfully inhabit so many different environments because their populations have been able to —

F hybridize with other species of insects

G adapt to a variety of habitats and food sources

H fill niches usually occupied by mammals

J occupy habitats that have no other life-forms

A harmless scarlet king snake and a venomous eastern coral snake have similar band patterns, as shown below. For the scarlet king snake, the adaptation of having a banding pattern like the eastern coral snake's is known as mimicry.

Scarlet king snake Eastern coral snake

The outcome of this adaptation in the scarlet king snake is to —

A make it easier for the scarlet king snake to attract prey

B make it easier for the scarlet king snake to interbreed with the other snake

C allow the scarlet king snake to blend in with its environment

D protect the scarlet king snake from predators

Some organisms have genes that improve their ability to survive and reproduce. If the genes also help their offspring survive and reproduce, then which of the following will most likely increase?

F The frequency of the genes in one individual

G The frequency of the genes in the population

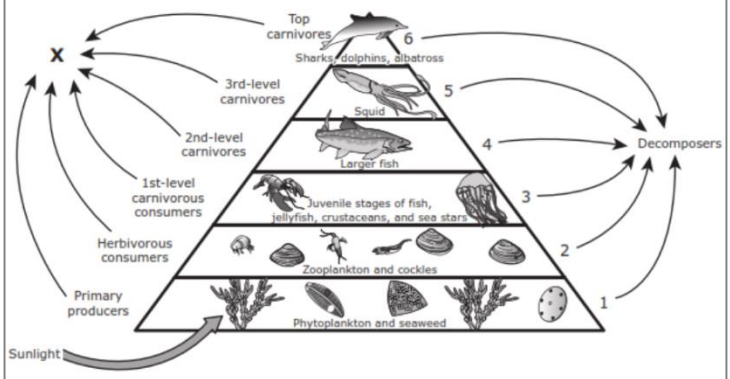
H The number of genes in one chromosome

J The number of genes in the species

B.12C

ANALYZE THE FLOW OF MATTER AND ENERGY THROUGH TROPHIC LEVELS USING VARIOUS MODELS, INCLUDING FOOD CHAINS, FOOD WEBS, AND ECOLOGICAL PYRAMIDS

A marine ecosystem is represented below.



What is lost to the environment at each of the trophic levels of this ecosystem?

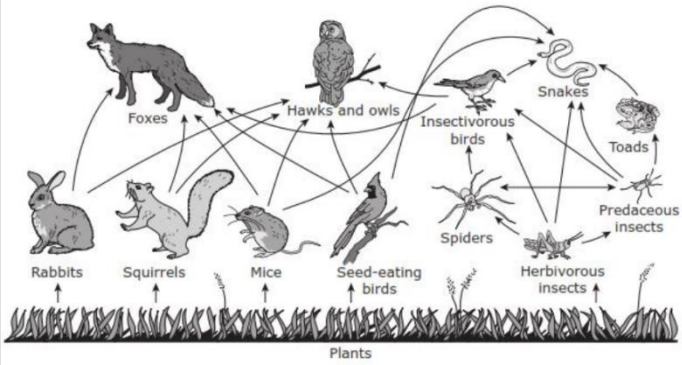
F Nutrients from the soil

G Living space for the organisms

H Food sources

J Heat

A terrestrial food web is shown below.



Which of the following lists only organisms that are secondary consumers in this food web?

F Mice, rabbits, herbivorous insects, and squirrels

G Predaceous insects, toads, spiders, and foxes

H Spiders, foxes, owls, hawks, and snakes

J Insectivorous birds, seed-eating birds, owls, and hawks

The Texas blind salamander (*Eurycea rathbuni*) lives in the Edwards Aquifer region around San Marcos. Along with other species the salamander lives in total darkness in the underground crevices and caves of the aquifer region. The table lists some of the organisms that live in this environment and their food sources.

Edwards Aquifer Cave Inhabitants	Food Sources
Texas blind salamander	Blind shrimp, amphipods
Blind shrimp	Protozoa, fungi, detritus
Snails	Detritus
Amphipods	Detritus
Intestinal roundworm	Texas blind salamander

In an energy pyramid for these aquifer cave dwellers, which of the following would be placed at the bottom?

A Snails

B Blind shrimp

C Protozoa

D Texas blind salamanders

Notes

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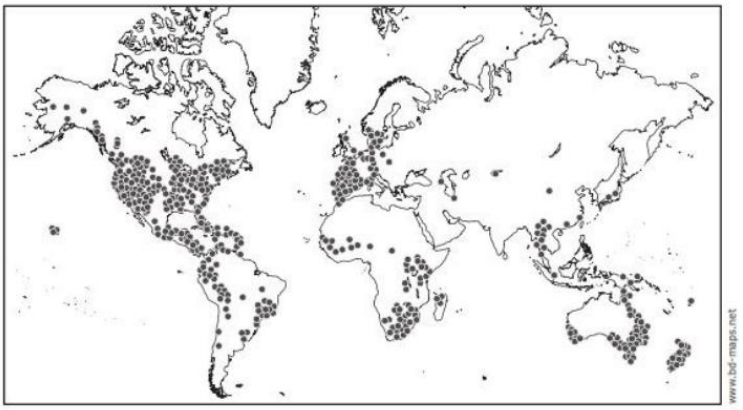
https://goo.gl/zXBzAB

B.12F

DESCRIBE HOW ENVIRONMENTAL CHANGE CAN IMPACT ECOSYSTEM STABILITY

Notes

Amphibians are dying in large numbers after being infected by an aquatic fungus called *Batrachochytrium dendrobatidis*. The origin of this fungus is unknown, but scientists suspect that humans are helping spread it. More than 350 amphibian species have been affected, and at least 200 species of frogs have suffered serious reductions in population or become extinct. The map below shows the worldwide distribution of *B. dendrobatidis*.



What will be the most likely impact of the decline in frog populations resulting from the fungal infection?

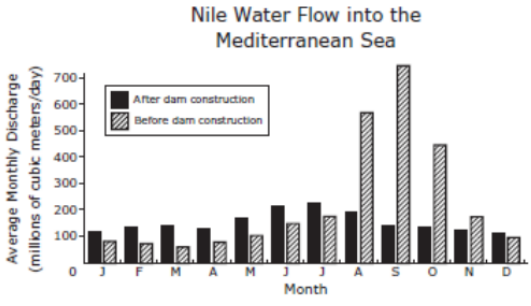
A New species of frogs that feed on both the fungus and the infected species of frogs will evolve.

B Plants will no longer grow in the waters of the affected ecosystems, and fish species will increase.

C The fungus will move on land and destroy reptile and mammal populations in tropical ecosystems.

D Populations of algae and mosquitoes will increase, leading to fish die-offs and potential increases in human malaria cases.

The Nile River flows into the Mediterranean Sea. The Aswan High Dam contains the flow of water from the river and reduces the annual fall flooding. The floodwater is trapped behind the huge dam, allowing irrigation for agriculture. Sediments that would be washed away by the annual floods are also trapped behind the dam. The graph shows the water flow from the Nile that enters the Mediterranean Sea.



How has this dam most likely affected the Mediterranean Sea ecosystem?

A Reduced nutrients from the land support fewer producers in the sea.

B Water trapped behind the dam causes the marine ecosystem to move inland.

C The flooding in August through November causes marine life to be destroyed.

D The water temperature of the sea has increased.

Notes