AP BIO INSTA-REVIEW

TOPIC 8.1

Responses to the Environment

ENE-3.D.1

Organisms respond to changes in their environment through behavioral and physiological mechanisms.

ENE-3.D.2

Organisms exchange information with one another in response to internal changes and external cues, which can change behavior.

AP BIO INSTA-REVIEW

TOPIC 8.1

Responses to the Environment

IST-5.A.1

Individuals can act on information and communicate it to others.

IST-5.A.2

Communication occurs through various mechanisms–

a. Organisms have a variety of signaling behaviors that produce changes in the behavior of other organisms and can result in differential reproductive success.

b. Animals use visual, audible, tactile, electrical, and chemical signals to indicate dominance, find food, establish territory, and ensure reproductive success.

AP BIO INSTA-REVIEW

TOPIC 8.1

Responses to the Environment

IST-5.A.3

Responses to information and communication of information are vital to natural selection and evolution–

a. Natural selection favors innate and learned behaviors that increase survival and reproductive fitness.

b. Cooperative behavior tends to increase the fitness of the individual and the survival of the population.

AP BIO INSTA-REVIEW

TOPIC

8.1

What are the different types of communication between organisms?

AP BIO INSTA-REVIEW

TOPIC 8.1

What are the different types of communication between organisms?

Visual

Tactile

Auditory

Chemical

Electrical

AP BIO INSTA-REVIEW

TOPIC 8.1

Which is favorable for long distance in dark?

A. Auditory

B. Chemical

C. Tactile

D. Visual

AP BIO INSTA-REVIEW

TOPIC 8.1

Which is favorable for long distance in dark?

A. Auditory

Auditory are noises. This means that it is able to take place in the dark and long distance. Tactile would be appropriate for dark but can **NOT** be done at long distances. Visual would **NOT** be appropriate for dark as you will be unable to see the signal. Chemical could take place in the dark, but it takes a long time for chemicals to diffuse which would be an inefficient communication method.

AP BIO INSTA-REVIEW

TOPIC 8.1

Which is favorable for long distance underwater?

A. Auditory

B. Chemical

C. Tactile

D. Visual

AP BIO INSTA-REVIEW

TOPIC 8.1

Which is favorable for long distance underwater?

B. Chemical

Chemical signals can diffuse in the water to travel long distances. Visual would be inefficient at long distances. Tactile would be inefficient at long distances. Sound waves do not travel long distances in water making auditory inefficient.

AP BIO INSTA-REVIEW

TOPIC 8.1

Peacocks are brightly colored to attract a mate. Which does peacock use for mating?

A. Auditory

B. Chemical

C. Tactile

D. Visual

AP BIO INSTA-REVIEW

TOPIC 8.1

Peacocks are brightly colored to attract a mate. Which does peacock use for mating?

D. Visual

The prompt states that the peacock is brightly colored which is a visual signal.

AP BIO INSTA-REVIEW

TOPIC 8.1

Birds sing a song to attract a mate. Which does a bird use in mating?

A. Auditory

B. Chemical

C. Tactile

D. Visual

AP BIO INSTA-REVIEW

TOPIC 8.1

Birds sing a song to attract a mate. Which does a bird use in mating?

A. Auditory

A song is a noise which would be an example of an auditory signal.

AP BIO INSTA-REVIEW

TOPIC

8.1

Why do organisms communicate?

AP BIO INSTA-REVIEW

TOPIC 8.1

Why do organisms communicate?

Indicate dominance

Find food

Establish territory

Reproductive success

AP BIO INSTA-REVIEW

TOPIC 8.1

Which signal is used by dogs for marking territory?

A. Auditory

B. Chemical

C. Tactile

D. Visual

AP BIO INSTA-REVIEW

TOPIC 8.1

Which signal is used by dogs for marking territory?

B. Chemical

When the dog urinates on the item (tree, grass, fire hydrant, light pole, etc.), there are chemicals in their urine. This will be used as signal for other dogs in the area that this is their territory.

AP BIO INSTA-REVIEW

TOPIC 8.1

Innate vs. Learned Behaviors?

A. Innate is trial/error & learned is born

B. Innate is born & learned is trial/error

C. Innate is taught by imprinting & learned is trial/error

D. Innate is trial/error & learned is taught by imprinting

AP BIO INSTA-REVIEW

TOPIC 8.1

Innate vs. Learned Behaviors?

B. Innate is born & learned is trial/error

Innate behaviors usually involve basic life functions, such as finding food or caring for offspring. These are usually under genetic control because those unable to complete will not survive to reproduce. Examples: Spider spinning a web, bird building a nest, caterpillar making a cocoon.

Learning behaviors are trial and error. These develop during the organism's lifetime. Example: crow bending wire into a hook shape, chimp strip leaves from a twig and putting into a termite hole to get food

AP BIO INSTA-REVIEW

TOPIC 8.1

What is altruism?

A. Behavior to increase fitness of self

B. Behavior to find food

C. Selfless behavior that increases fitness of population

D. Selfless behavior to feed another member to population

AP BIO INSTA-REVIEW

TOPIC 8.1

What is altruism?

C. Selfless behavior that increases fitness of population

Altruistic behaviors are those selfless behaviors completed by organisms. Example: Belding squirrels will make an alarm call when a predator comes into an area which decreases the individual squirrel's fitness but increases the fitness for the population (inclusive fitness)

AP BIO INSTA-REVIEW

TOPIC

8.1

Where a stimulus affects behavior (ex. bell ringing)

A. Classical conditioning

B. Conditional learning

C. Imprinting

D. Operant conditioning

AP BIO INSTA-REVIEW

TOPIC 8.1

Where a stimulus affects behavior (ex. bell ringing)

A. Classical conditioning

Classical conditioning is associative learning in which the behavior is associated with an arbitrary stimulus. I always tell my students to remember the CLASSIC experiment with Pavlov and the dogs – ring the bell, feed the dog, repeat, then ringing the bell induces salvation (even without the introduction of food)

AP BIO INSTA-REVIEW

TOPIC 8.1

Behavior affected by negative or positive outcomes

A. Classical conditioning
B. Conditional learning
C. Imprinting
D. Operant conditioning

AP BIO INSTA-REVIEW

TOPIC 8.1

Behavior affected by negative or positive outcomes

D. Operant conditioning

Operant conditions is a type of associative learning. This refers to the behavior being associated with a reward or punishment. The wolf that attacks the porcupine and gets quills to the face will not attack another porcupine. The chick-a-dee that pecks at the milk carton getting the cream will continue to peck to get additional cream.

AP BIO INSTA-REVIEW

TOPIC
8.1

A sensitive period where organism learns from parent

A. Classical conditioning
B. Conditional learning
C. Imprinting
D. Operant conditioning

AP BIO INSTA-REVIEW

TOPIC 8.1

A sensitive period where organism learns from parent

C. Imprinting

a rapid learning process that takes place early in the life of a social animal (such as a goose) and establishes a behavior pattern (such as recognition of and attraction to its own kind or a substitute)

AP BIO INSTA-REVIEW

TOPIC 8.1

What would happen if a bird was cross fostered during imprinting phase?

AP BIO INSTA-REVIEW

TOPIC 8.1

What would happen if a bird was cross fostered during imprinting phase?

Prezygotic barrier...

The bird would be unable to mater. It has learned the mating song for another species of bird so it will be unable to reproduce with its own species nor the species of the mating song.

AP BIO INSTA-REVIEW

TOPIC 8.1

Note:

"What does cross-fostering mean"

Basically being fostered by another species.

Here's the dictionary term...

cross-fostering (*uncountable*)

1. the technique of removing eggs from the nest of one species of bird, to be incubated in the nest of another. Usually done to aid the recovery of endangered species.

AP BIO INSTA-REVIEW

TOPIC 8.1

Mating Calls

A. Auditory

B. Chemical

C. Tactile

D. Visual

AP BIO INSTA-REVIEW

TOPIC 8.1

Mating Calls

A. Auditory

Mating calls for sounds, so this would be considered an auditory signal.

AP BIO INSTA-REVIEW

TOPIC 8.1

Pheromone trail that ants follow to find food source

A. Auditory

B. Chemical

C. Tactile

D. Visual

AP BIO INSTA-REVIEW

TOPIC 8.1

Pheromone trail that ants follow to find food source

B. Chemical

Pheromones are chemical signals that triggers a social behavior from other members of the same species.

AP BIO INSTA-REVIEW

TOPIC 8.1

Mating Dance

A. Auditory

B. Chemical

C. Tactile

D. Visual

AP BIO INSTA-REVIEW

TOPIC 8.1

Mating Dance

D. Visual

The mating dance will be seen by the opposite sex during intersexual selection.

AP BIO INSTA-REVIEW

TOPIC
8.1

What is differential reproductive success?

AP BIO INSTA-REVIEW

TOPIC 8.1

What is differential reproductive success?

A situation in which some individuals leave more offspring in the next generation than do others, often due to traits that provide advantages in survival and/or reproduction.

AP BIO INSTA-REVIEW

TOPIC

8.1

Innate behaviors are

A. Associated arbitrary stimulus

B. Inborn

C. Learning through observations

D. Trial and Error

AP BIO INSTA-REVIEW

TOPIC 8.1

Innate behaviors are

B. Inborn

Innate behaviors usually involve basic life functions, such as finding food or caring for offspring. These are usually under genetic control because those unable to complete will not survive to reproduce. Examples: Spider spinning a web, bird building a nest, caterpillar making a cocoon.

AP BIO INSTA-REVIEW

TOPIC 8.1

Learning response to arbitrary stimulus

A. Classical conditioning

B. Imprinting

C. Innate behavior

D. Operant conditioning

AP BIO INSTA-REVIEW

TOPIC 8.1

Learning response to arbitrary stimulus

A. Classical conditioning

Classical conditioning is associative learning in which the behavior is associated with an arbitrary stimulus. I always tell my students to remember the CLASSIC experiment with Pavlov and the dogs – ring the bell, feed the dog, repeat, then ringing the bell induces salvation (even without the introduction of food)

AP BIO INSTA-REVIEW

TOPIC 8.1

Chick a dee learns if it pecks at milk carton, it will get milk

A. Classical conditioning

B. Imprinting

C. Innate behavior

D. Operant conditioning

AP BIO INSTA-REVIEW

TOPIC 8.1

Chick a dee learns if it pecks at milk carton, it will get milk

D. Operant conditioning

Operant conditions is a type of associative learning. This refers to the behavior being associated with a reward or punishment. The wolf that attacks the porcupine and gets quills to the face will not attack another porcupine. The chick-a-dee that pecks at the milk carton getting the cream will continue to peck to get additional cream.

AP BIO INSTA-REVIEW

TOPIC 8.1

If a bird is cross fostered, what is the problem in terms of learned behaviors?

AP BIO INSTA-REVIEW

TOPIC 8.1

If a bird is cross fostered, what is the problem in terms of learned behaviors?

Due to imprinting, the baby bird will learn the mating song of the foster parent and be unable to mate with their species. It will undergo behavioral isolation from its own species.

AP BIO INSTA-REVIEW

TOPIC

8.1

How does an altruistic behavior increase the inclusive fitness?

AP BIO INSTA-REVIEW

TOPIC 8.1

How does an altruistic behavior increase the inclusive fitness?

Altruism is a self-less behavior. I use the example of the Belding Squirrels. If there is a predator present, one squirrel will make an alarm noise. The other squirrels will hide to protect themselves which ensures the colony is able to survive and reproduce.

AP BIO INSTA-REVIEW

TOPIC 8.2

Energy Flow Through Ecosystems

ENE-1.M.1

Organisms use energy to maintain organization, grow, and reproduce–

a. Organisms use different strategies to regulate body temperature and metabolism.

i. Endotherms use thermal energy generated by metabolism to maintain homeostatic body temperatures.

ii. Ectotherms lack efficient internal mechanisms for maintaining body temperature, though they may regulate their temperature behaviorally by moving into the sun or shade or by aggregating with other individuals.

b. Different organisms use various reproductive strategies in response to energy availability.

AP BIO INSTA-REVIEW

TOPIC 8.2

Energy Flow Through Ecosystems

ENE-1.M.1

Organisms use energy to maintain organization, grow, and reproduce–

c. There is a relationship between metabolic rate per unit body mass and the size of multicellular organisms–generally, the smaller the organism, the higher the metabolic rate.

d. A net gain in energy results in energy storage or the growth of an organism.

e. A net loss of energy results in loss of mass and, ultimately, the death of an organism.

AP BIO INSTA-REVIEW

TOPIC 8.2

Energy Flow Through Ecosystems

ENE-1.N.1

Changes in energy availability can result in changes in population size.

ENE.1.N.2

Changes in energy availability can result in disruptions to an ecosystem–

a. A change in energy resources such as sunlight can affect the number and size of the trophic levels.

b. A change in the producer level can affect the number and size of other trophic levels.

AP BIO INSTA-REVIEW

TOPIC 8.2

Energy Flow Through Ecosystems

ENE-1.0.1

Autotrophs capture energy from physical or chemical sources in the environment–

a. Photosynthetic organisms capture energy present in sunlight.

b. Chemosynthetic organisms capture energy from small inorganic molecules present in their environment, and this process can occur in the absence of oxygen.

ENE-1.0.2

Heterotrophs capture energy present in carbon compounds produced by other organisms.

a. Heterotrophs may metabolize carbohydrates, lipids, and proteins as sources of energy by hydrolysis.

AP BIO INSTA-REVIEW

TOPIC 8.2

Warm-blooded organisms are actually...

A. Ectotherms

B. Endotherms

AP BIO INSTA-REVIEW

TOPIC 8.2

Warm-blooded organisms are actually...

B. Endotherms

Endotherms are organisms that regulate their own body temperature through metabolism. These organisms are called "warm-blooded" in elementary and middle school classes. Biologists call these organisms "regulators".

AP BIO INSTA-REVIEW

TOPIC 8.2

Where do endotherms get their body heat from?

A. Cellular Respiration

B. Environment

C. Photosynthesis

D. Thermophiles

AP BIO INSTA-REVIEW

TOPIC 8.2

Where do endotherms get their body heat from?

A. Cellular Respiration

The process of cellular respiration is an exergonic reaction (releases energy). This process is inefficient so the extra energy that is not used to synthesize ATP is released as heat energy.

AP BIO INSTA-REVIEW

TOPIC
8.2

"Cold-Blooded" organisms have cold-blood...

A. True

B. False

AP BIO INSTA-REVIEW

TOPIC 8.2

"Cold-Blooded" organisms have cold-blood...

B. False

This is a misconception that you learned in elementary school. "Cold-blooded organisms" do not have cold-blood. The term "cold-blooded" refers to that the organisms use their environment to control their body temperatures. Biologists call them "conformers".

AP BIO INSTA-REVIEW

TOPIC 8.2

"Cold-Blooded" organisms are...

A. Ectotherms

B. Endotherms

AP BIO INSTA-REVIEW

TOPIC 8.2

"Cold-Blooded" organisms are...

A. Ectotherms

Ectotherms are organisms that absorb their heat energy from their environment. These are "conformers" and will use their environment to regulate their internal temperature.

AP BIO INSTA-REVIEW

TOPIC 8.2

Where do ectotherms get their body heat from?

A. Cellular Respiration

B. Environment

C. Photosynthesis

D. Thermophiles

AP BIO INSTA-REVIEW

TOPIC 8.2

Where do ectotherms get their body heat from?

B. Environment

Ectotherms are "cold-blooded organisms" that regulate their internal body temperature using their environment. Example: crocodile – when they are cold, they bask in the sun or when they are warm, they go take a dip in the water

AP BIO INSTA-REVIEW

TOPIC

8.2

Assuming the same size of organisms, at cooler temperatures, who would have a higher O_2 consumption?

A. Ectotherms

B. Endotherms

AP BIO INSTA-REVIEW

TOPIC 8.2

Assuming the same size of organisms, at cooler temperatures, who would have a higher O_2 consumption?

B. Endotherms

Endotherms regulate their body temperature using metabolism while ectotherms regulate their body temperature using their environments. Due to this, the endotherm would require a higher concentration of oxygen as oxygen is the final electron acceptor. The endotherm must undergo more cellular respiration to generate the heat to warm the organim,

AP BIO INSTA-REVIEW

TOPIC

8.2

How does a litter size change based on energy availability?

AP BIO INSTA-REVIEW

TOPIC 8.2

How does a litter size change based on energy availability?

If there is less energy available, the litter size will be smaller. The organisms will have less offspring due to the low energy available for reproduction and growth.

AP BIO INSTA-REVIEW

TOPIC

8.2

The smaller the organism, the ____ the metabolic rate.

A. Higher

B. Lower

AP BIO INSTA-REVIEW

TOPIC 8.2

The smaller the organism, the ____ the metabolic rate.

A. Higher

The smaller the organism, the higher the surface area to volume ratio. This leads to a higher metabolic rate in the organism.

AP BIO INSTA-REVIEW

TOPIC 8.2

Why is metabolic rate per unit body mass higher in smaller animals?

AP BIO INSTA-REVIEW

TOPIC 8.2

Why is metabolic rate per unit body mass higher in smaller animals?

However, BMR is higher per unit of body mass in small animals compared to larger ones. This is because the higher metabolic rate of small animals needs a greater delivery of oxygen to tissues around the body.

Also, the smaller animals have a greater surface area to volume ratio, so more heat is lost.

AP BIO INSTA-REVIEW

TOPIC
8.2

Net gain of energy by organism causes...

A. Decay & Energy Storage

B. Gain of Mass & Death

C. Growth & Energy Storage

D. Loss of Mass & Death

AP BIO INSTA-REVIEW

TOPIC 8.2

Net gain of energy by organism causes...

C. Growth & Energy Storage

Gain of energy refers to an endergonic process. Growth of an organism is an endergonic process. Energy storage is an endergonic process.

AP BIO INSTA-REVIEW

TOPIC 8.2

Net loss of energy results in...

A. Decay & Energy Storage

B. Gain of Mass & Death

C. Growth & Energy Storage

D. Loss of Mass & Death

AP BIO INSTA-REVIEW

TOPIC 8.2

Net loss of energy results in...

D. Loss of Mass & Death

Loss of energy refers to an exergonic process. Losing mass refers to an exergonic process. If you lose too much energy, the organism is unable to complete simple tasks which can result in death.

AP BIO INSTA-REVIEW

TOPIC
8.2

What property of water allows for cooling from sweat?

A. Adhesion

B. Cohesion

C. High Heat of vaporization

D. Less dense as solid

AP BIO INSTA-REVIEW

TOPIC 8.2

What property of water allows for cooling from sweat?

C. High Heat of vaporization

High heat of vaporization refers to that water requires a large amount of heat energy to vaporize liquid water to gaseous water vapor.

AP BIO INSTA-REVIEW

TOPIC

8.2

What is this called when this "heat of vaporization" is used?

AP BIO INSTA-REVIEW

TOPIC 8.2

What is this called when this “heat of vaporization” is used?

Evaporative cooling

AP BIO INSTA-REVIEW

TOPIC

8.2

Goosebumps are a vestigial structure to keep warm.

A. True

B. False

AP BIO INSTA-REVIEW

TOPIC 8.2

Goosebumps are a vestigial structure to keep warm.

A. True

Vestigial structures are homologous structures from a common ancestor with no apparent function.

AP BIO INSTA-REVIEW

TOPIC

8.2

Describe how countercurrent exchange keeps core warm.

AP BIO INSTA-REVIEW

TOPIC 8.2

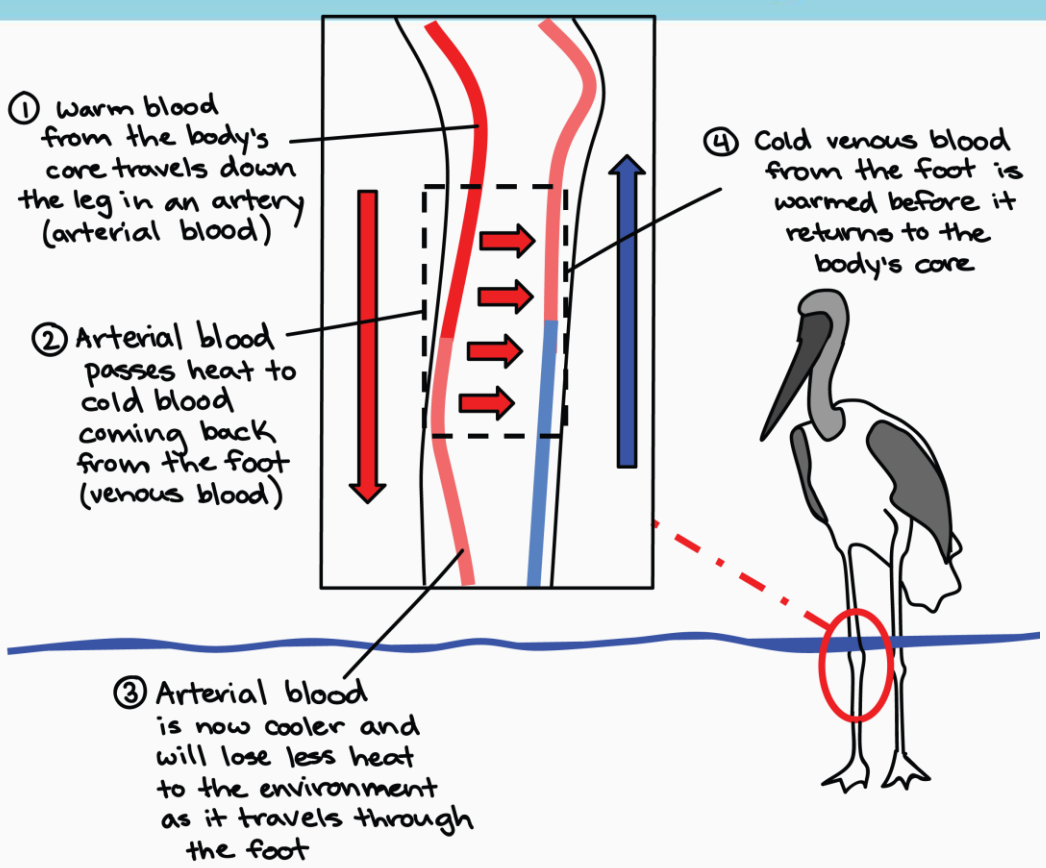
Describe how countercurrent exchange keeps core warm.

Countercurrent exchange involves the fluid moving in the opposite direction exchanging something. This something in this case is heat. The blood leaving the core is warm and that warmth is transferred to the blood re-entering the core.

AP BIO INSTA-REVIEW

TOPIC 8.2

Describe how countercurrent exchange keeps core warm.



So the blood coming back into the core is warmed by the blood leaving the core. This reduced energy lost to the environment and maintains the body temperature of the organism.

AP BIO INSTA-REVIEW

TOPIC
8.2

A reduction in ___ would cause a decrease in entire chain.

A. Decomposer

B. Primary Consumer

C. Primary Producer

D. Sunlight

AP BIO INSTA-REVIEW

TOPIC 8.2

A reduction in ___ would cause a decrease in entire chain.

C. Primary Producer

The primary producer is the food source for the entire food chain. If there is a decrease in the primary producer, there is less available food for the primary consumers. If there is a decrease in the primary consumers, then there is less available food for secondary consumers.

AP BIO INSTA-REVIEW

TOPIC 8.2

When you control producer level, what type of model does this describe?

A. Bottom-Up Model

B. Top-Down Model

AP BIO INSTA-REVIEW

TOPIC 8.2

When you control producer level, what type of model does this describe?

A. Bottom-Up Model

Using the word to assist your thinking...

BOTTOM-UP model refers to starting at the BOTTOM and moving up to the TOP. In a food chain, the producer is at the BOTTOM of the chain.

AP BIO INSTA-REVIEW

TOPIC 8.2

What are all secondary consumers?

A. Carnivores

B. Decomposer

C. Herbivore

D. Producer

AP BIO INSTA-REVIEW

TOPIC 8.2

What are all secondary consumers?

A. Carnivores

A secondary consumer consumes the primary consumer which consumes the primary producer.

The primary producer is an autotroph and relies on the sun.
The secondary producer is a heterotroph and consumers the primary producer which is another organism making the secondary consumer a carnivore.

AP BIO INSTA-REVIEW

TOPIC
8.2

Where do photosynthetic organisms get most of their energy?

A. Inorganic molecules
B. Moonlight
C. Organic molecules
D. Sunlight

AP BIO INSTA-REVIEW

TOPIC 8.2

Where do photosynthetic organisms get most of their energy?

D. Sunlight

Energy cannot be created or destroyed. The PHOTOsynthetic organisms require LIGHT. This light is used to provide the solar energy for photosynthesis. The LIGHT must come from SUNLIGHT.

AP BIO INSTA-REVIEW

TOPIC 8.2

Where do chemosynthetic organisms get most of their energy?

A. Inorganic molecules

B. Moonlight

C. Organic molecules

D. Sunlight

AP BIO INSTA-REVIEW

TOPIC 8.2

Where do chemosynthetic organisms get most of their energy?

A. Inorganic molecules

Energy cannot be created or destroyed. The CHEMOsynthetic organisms require CHEMICALS. This chemical is used to provide the chemical energy for chemosynthesis. These organisms use inorganic molecules to synthesize organic molecules.

AP BIO INSTA-REVIEW

TOPIC
8.2

What can heterotrophs not metabolize for energy?

A. Carbohydrates

B. Lipids

C. Nucleic Acids

D. Proteins

AP BIO INSTA-REVIEW

TOPIC 8.2

What can heterotrophs not metabolize for energy?

C. Nucleic Acids

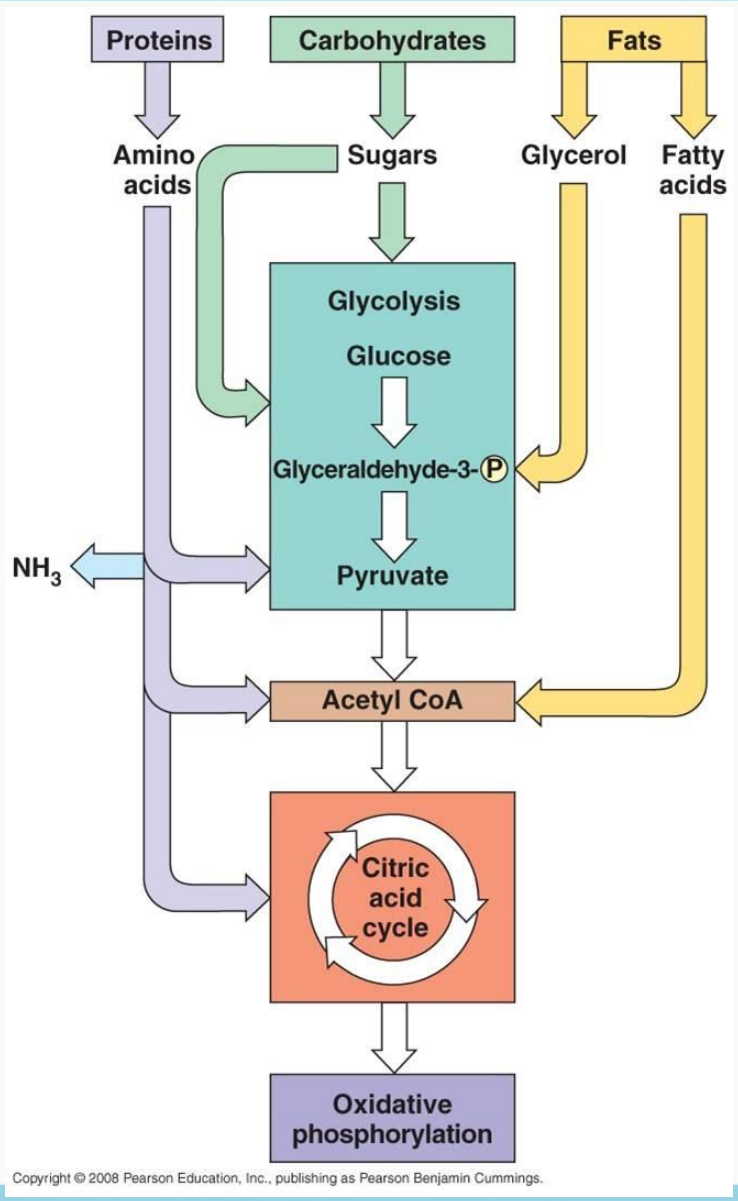
Three of the four macromolecules can be used for energy. Carbohydrates (sugars) enter glycolysis. Proteins (amino acids) enter at the end of glycolysis or the beginning of Krebs cycle. Fats (glycerol) enter in the middle of glycolysis and (fatty acids) enter into the Krebs cycle. There is no mention of nucleic acids because they are NOT used for energy.

AP BIO INSTA-REVIEW

TOPIC 8.2

What can heterotrophs not metabolize for energy?

C. Nucleic Acids

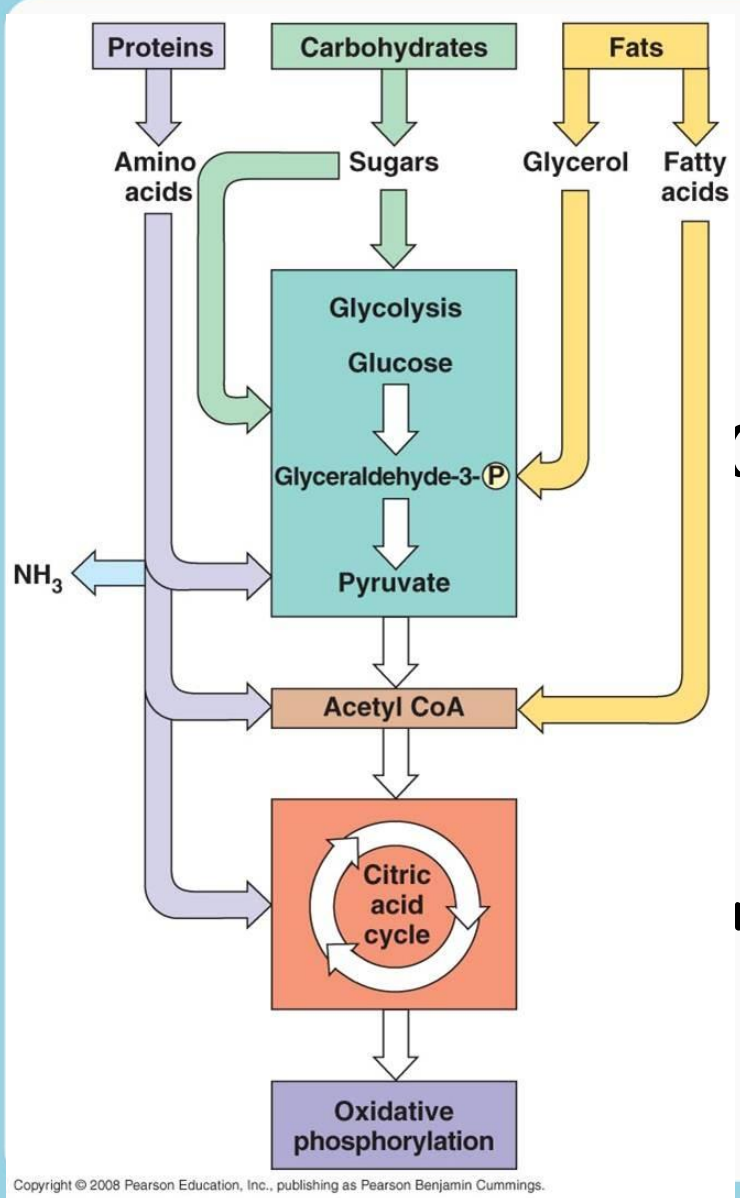


AP BIO INSTA-REVIEW

TOPIC 8.2

What can heterotrophs not metabolize for energy?

C. Nucleic Acids



Three of the four macromolecules can be used for energy. Carbohydrates (sugars) enter glycolysis. Proteins (amino acids) enter at the end of glycolysis or the beginning of Krebs cycle. Fats (glycerol) enter in the middle of glycolysis and (fatty acids) enter into the Krebs cycle. There is no mention of nucleic acids because they are NOT used for energy.

AP BIO INSTA-REVIEW

TOPIC 8.2

Which stores the most energy per molecule?

A. Carbohydrates

B. Lipids

C. Nucleic Acids

D. Proteins

AP BIO INSTA-REVIEW

TOPIC 8.2

Which stores the most energy per molecule?

B. Lipids

Fat has the highest energy potential given that it provides 9 calories per gram. Protein and carbohydrates provide 4 calories per gram each. Carbohydrates are the easiest for the body to break down though.

AP BIO INSTA-REVIEW

TOPIC 8.2

Fun Fact: Where do lipids enter cellular respiration pathway?

A. Glycolysis

B. Krebs Cycle

C. Electron Transport

D. Chemiosmosis

AP BIO INSTA-REVIEW

TOPIC 8.2

Fun Fact: Where do lipids enter cellular respiration pathway?

B. Krebs Cycle

Fatty acids are oxidized through fatty acid or β-oxidation into two-carbon acetyl CoA molecules, which can then enter the Krebs cycle to generate ATP.

AP BIO INSTA-REVIEW

TOPIC

8.2

What is an endotherm?

A. Organism generates heat by metabolism

B. Organism generates heat by basking in sun

C. Organism that releases heat

D. Organism that absorbs heat

AP BIO INSTA-REVIEW

TOPIC 8.2

What is an endotherm?

A. Organism generates heat by metabolism

Endotherms are "warm-blooded organisms" that are able to regulate their own body temperature using metabolism.

AP BIO INSTA-REVIEW

TOPIC
8.2

What is an ectotherm?

A. Organism that generates heat by performing metabolism
B. Organism that uses external sources of heat
C. Organism that releases heat to warm the organism
D. Organism that absorbs heat to cool the organism

AP BIO INSTA-REVIEW

TOPIC 8.2

What is an ectotherm?

B. Organism that uses external sources of heat

Ectotherms are "cold-blooded organisms" that use their external environment to regulate their internal temperature. When they are cold, they will lay out ("bask") in the sun.

AP BIO INSTA-REVIEW

TOPIC
8.2

Which organism requires more food at the same temperature?

A. Ectotherm

B. Endotherm

AP BIO INSTA-REVIEW

TOPIC 8.2

Which organism requires more food at the same temperature?

B. Endotherm

Since endotherms are generating their own heat through cellular respiration, an endotherm requires more food to provide the fuel to cellular respiration. Have you ever noticed that snakes only eat once a week?

AP BIO INSTA-REVIEW

TOPIC
8.2

Which organism consumes more oxygen at cooler temperatures?

A. Ectotherm
B. Endotherm

AP BIO INSTA-REVIEW

TOPIC 8.2

Which organism consumes more oxygen at cooler temperatures?

B. Endotherm

Since endotherms are generating their own heat through cellular respiration, an endotherm requires more oxygen as the final electron acceptor in cellular respiration. Have you ever noticed that fish move their operculum slower in the cold water? These ectotherms have a decrease in cellular respiration as it is colder.

AP BIO INSTA-REVIEW

TOPIC 8.2

Why would an endotherm have a higher oxygen consumption at low temperatures?

AP BIO INSTA-REVIEW

TOPIC 8.2

Why would an endotherm have a higher oxygen consumption at low temperatures?

Endotherms regulation their body temperature through metabolism (aka cellular respiration). As the temperature decreases, the organism needs to generate heat to maintain body temperature. More metabolism means, more oxygen consumption because oxygen is the final electron acceptor.

AP BIO INSTA-REVIEW

TOPIC 8.2

How does metabolic rate compare to size of organism?

A. Smaller the organism, the higher the metabolic rate

B. Larger the organism, the higher the metabolic rate

AP BIO INSTA-REVIEW

TOPIC 8.2

How does metabolic rate compare to size of organism?

A. Smaller the organism, the higher the metabolic rate

It's all about that surface area. The smaller the organism, the larger the surface area. This leads to heat loss which results in an additional amount of oxygen required for cellular respiration to maintain body temperatures.

AP BIO INSTA-REVIEW

TOPIC 8.2

If a secondary consumer population decreases, what would happen to the producers?

A. Decrease

B. Increase

C. Stay the Same

AP BIO INSTA-REVIEW

TOPIC 8.2

If a secondary consumer population decreases, what would happen to the producers?

A. Decrease

The secondary consumer will consume the primary consumer. A decrease in the secondary consumer results in an increase in the primary consumer. If there is an increase in the primary consumer, there will be more primary producer consumed leading to a DECREASE.

AP BIO INSTA-REVIEW

TOPIC
8.2

What is an autotroph?

A. Produces its own food stored in organic compounds

B. Produces its own energy from metabolic reactions

C. Produces its own ATP from feeding on lower trophics levels

D. Produces its own light energy from chemical reactions

AP BIO INSTA-REVIEW

TOPIC 8.2

What is an autotroph?

A. Produces its own food stored in organic compounds

Autotrophs will use solar energy or energy from inorganic molecules to synthesize organic compounds to store the energy. Then, they will break down those organic compounds for cellular energy through cellular respiration.

AP BIO INSTA-REVIEW

TOPIC

8.2

How does chemoautotroph differ from photoautotroph?

A. Chemoautotroph makes food from sunlight

B. Photoautotroph makes the food from sunlight (solar energy)

C. Chemoautotroph makes the food with decomposing detritus

D. Photoautotroph makes the food from decomposing detritus

AP BIO INSTA-REVIEW

TOPIC 8.2

How does chemoautotroph differ from photoautotroph?

B. Photoautotroph makes the food from sunlight (solar energy)

The "photo" in photoautotroph means light. The photoautotrophs are using solar energy to synthesize organic compounds. Chemoautotrophs will use inorganic molecules as their energy source.

AP BIO INSTA-REVIEW

TOPIC 8.2

Oxygen is required by the photosynthesis process

A. True

B. False

AP BIO INSTA-REVIEW

TOPIC 8.2

Oxygen is required by the photosynthesis process

B. False

Oxygen is a PRODUCT of photosynthesis. During the light reactions in photosystem II, the water molecule undergoes photolysis which splits the water molecule releasing the electrons, protons, and oxygen.

AP BIO INSTA-REVIEW

TOPIC

8.2

Plants require oxygen.

A. True

B. False

AP BIO INSTA-REVIEW

TOPIC 8.2

Plants require oxygen.

A. True

Plants have a mitochondria and undergo cellular respiration. The oxygen is the final electron acceptor in cellular respiration.

AP BIO INSTA-REVIEW

TOPIC

8.2

Plants have a mitochondria.

A. True

B. False

AP BIO INSTA-REVIEW

TOPIC 8.2

Plants have a mitochondria.

A. True

Plants have both a mitochondria (for cellular respiration) and a chloroplast (for photosynthesis). Recall, all eukaryotes have a mitochondria based on endosymbiotic theory that the chemosynthetic prokaryote was engulfed prior to the photosynthetic prokaryote.

AP BIO INSTA-REVIEW

TOPIC 8.2

Mrs. Jones, why do plants have a mitochondria and require oxygen if they are autotrophs?

Mitochondria is believed to be a chemosynthetic prokaryote which was engulfed, so all eukaryotes have a mitochondria.

The ATP synthesized in the process is used in the process. They do not make ATP for cellular activities during photosynthesis. They make carbohydrates which are broken down by mitochondria (hence the higher oxygen consumption)

AP BIO INSTA-REVIEW

TOPIC

8.2

What is a heterotroph?

A. Organism that must consume organic molecules for light.

B. Organism that breaks down organic molecules for energy.

AP BIO INSTA-REVIEW

TOPIC 8.2

What is a heterotroph?

B. Organism that breaks down organic molecules for energy.

Heterotroph must consume an autotroph for cellular energy. These organism break down the organic molecules synthesized by autotrophs (or organic molecules synthesized from consuming autotrophs)

AP BIO INSTA-REVIEW

TOPIC
8.2

Which macromolecule is not broken down for energy?

A. Carbohydrates

B. Lipids

C. Nucleic Acids

D. Proteins

AP BIO INSTA-REVIEW

TOPIC 8.2

Which macromolecule is not broken down for energy?

C. Nucleic Acids

Three of the macromolecules are used for energy except nucleic acids. The carbohydrates are used in glycolysis, the proteins are used at the end of glycolysis and during Krebs cycle, and fats are used in glycolysis (glycerol) and Krebs cycle (fatty acids)

AP BIO INSTA-REVIEW

TOPIC 8.3

Population Ecology

SYI-1.G.1

Populations comprise individual organisms that interact with one another and with the environment in complex ways.

RELEVANT EQUATION

Population Growth—

$$\frac{dN}{dt} = B - D$$

where:

dt = chage in time

B = birth rate

D = death rate

N = population size

RELEVANT EQUATION

Exponential Growth—

$$\frac{dN}{dt} = r_{max} N$$

where:

dt = change in time

N = population size

r_{max} = maximum per capita growth rate of population

AP BIO INSTA-REVIEW

TOPIC 8.3

Population Ecology

SYI-1.G.2

Many adaptations in organisms are related to obtaining and using energy and matter in a particular environment–

a. Population growth dynamics depend on a number of factors. Reproduction without constraints results in the exponential growth of a population.

AP BIO INSTA-REVIEW

TOPIC 8.3

Which of the following add to a population size?

A. Births & Immigration

B. Birth & Emigration

C. Death & Emigration

D. Death & Immigration

AP BIO INSTA-REVIEW

TOPIC 8.3

Which of the following add to a population size?

A. Births & Immigration

When an individual is born, this is an addition of a new individual which increases the population size.

When an individual immigrates, the addition of the individual into the area will increase the population size.

AP BIO INSTA-REVIEW

TOPIC 8.3

Which of the following remove from a population size?

A. Births & Immigration

B. Birth & Emigration

C. Death & Emigration

D. Death & Immigration

AP BIO INSTA-REVIEW

TOPIC 8.3

Which of the following remove from a population size?

C. Death & Emigration

Death will remove individuals from the population as they are no longer in the population.

Emigration will remove individuals from the population as they are no longer in the population.

AP BIO INSTA-REVIEW

TOPIC 8.3

In the rate of increase formulas, what does b stand for?

A. Births per capita

B. Deaths per capita

C. Total births/year

D. Total deaths/year

AP BIO INSTA-REVIEW

TOPIC 8.3

In the rate of increase formulas, what does b stand for?

A. Births per capita

b = per capita birth rate

d = per capita death rate

r = b – d

N = population size

dN/dt = change in population size

AP BIO INSTA-REVIEW

TOPIC 8.3

In the rate of increase formulas, what does d stand for?

A. Births per capita

B. Deaths per capita

C. Total births/year

D. Total deaths/year

AP BIO INSTA-REVIEW

TOPIC 8.3

In the rate of increase formulas, what does D stand for?

B. Deaths per capita

b = per capita birth rate

d = per capita death rate

r = b – d

N = population size

dN/dt = change in population size

AP BIO INSTA-REVIEW

TOPIC

8.3

If b = 4 and d = 8, what is r?

A. -12

B. -4

C. 4

D. 12

AP BIO INSTA-REVIEW

TOPIC

8.3

If B = 4 and D = 8, what is r?

B. -4

b = per capita birth rate

d = per capita death rate

$r = b - d$

$r = 4 - 8$

$r = -4$

AP BIO INSTA-REVIEW

TOPIC

8.3

If r = 0.5 and N = 1000, what is dN/dt?

A. 500
B. 1000
C. 1500
D. 2000

AP BIO INSTA-REVIEW

TOPIC 8.3

If r = 0.5 and N = 1000, what is dN/dt?

A. 500

N = population size

$dN/dt = rN$

$dN/dt = 0.5(1000)$

$dN/dt = 500$

AP BIO INSTA-REVIEW

TOPIC 8.3

Type of growth from reproduction without constraint

A. Decreasing

B. Increasing

C. Logistic

D. Exponential

AP BIO INSTA-REVIEW

TOPIC 8.3

Type of growth from reproduction without constraint

D. Exponential

Exponential growth will allow for the population to grow without any restrictions on size. This is the carrying capacity.

These individuals have no predators and unlimited race track.

AP BIO INSTA-REVIEW

TOPIC 8.3

What makes up a population?

A. Different species in the same area

B. Different species that interbreed to make hybrids

C. Same species in the same area

D. Same species separated by geographical barrier

AP BIO INSTA-REVIEW

TOPIC 8.3

What makes up a population?

C. Same species in the same area

By definition, a population is group of individual of the same species living in an area.

AP BIO INSTA-REVIEW

TOPIC 8.3

How does a population increase in individuals?

A. Births and Deaths

B. Births and Immigration

C. Deaths and Emigration

D. Immigration and Emigration

AP BIO INSTA-REVIEW

TOPIC 8.3

How does a population increase in individuals?

B. Births and Immigration

Births add new individuals and immigration allow for addition of new individuals. This together leads to an increase in the population.

AP BIO INSTA-REVIEW

TOPIC 8.3

What decreases a population size?

A. Births and Deaths

B. Births and Immigration

C. Deaths and Emigration

D. Immigration and Emigration

AP BIO INSTA-REVIEW

TOPIC 8.3

What decreases a population size?

C. Deaths and Emigration

Deaths will remove individuals from a population and emigration will lead to individuals leading the area. This leads to a decrease in population size.

AP BIO INSTA-REVIEW

TOPIC 8.3

How do you solve for the rate of increase?

A. Birth Rate + Death Rate

B. Birth Rate – Death Rate

C. Birth Rate x Death Rate

D. Birth Rate/Death Rate

AP BIO INSTA-REVIEW

TOPIC 8.3

How do you solve for the rate of increase?

B. Birth Rate – Death Rate

Per capita rate of increase in the birth rate minus the death rate. This is logical as we subtracting the deaths from the births which tells us how much the population increased by.

AP BIO INSTA-REVIEW

TOPIC

8.3

Type of growth rate with unlimited resources

A. Exponential
B. Logarithmic
C. Logistic

AP BIO INSTA-REVIEW

TOPIC 8.3

Type of growth rate with unlimited resources

A. Exponential

Exponential growth rate curves are also known as J shaped curved since the population size grows exponentially in the presence of unlimited resources.

AP BIO INSTA-REVIEW

TOPIC 8.3

What maintains the logistic growth?

A. Carrying Capacity

B. Rate of Increase

C. Birth Rate

D. Death Rate

AP BIO INSTA-REVIEW

TOPIC 8.3

What maintains the logistic growth?

A. Carrying Capacity

The carrying capacity is the maximum individuals that can support by the environment in an area.

AP BIO INSTA-REVIEW

TOPIC

8.3

If r = 0.5 and N = 200, how many individuals remain after 1 generation?

A. 200
B. 250
C. 300
D. 350

AP BIO INSTA-REVIEW

TOPIC 8.3

If r = 0.5 and N = 200, how many individuals remain after 1 generation?

c. 300

$$dN/dt = rN$$

$$dN/dt = 0.5\ (200)$$

$$dN/dt = 100$$

$$200 + 100 = 300$$

AP BIO INSTA-REVIEW

TOPIC

8.3

If r = 0.5, N = 200 and K = 400, how many individuals remain after 1 generation?

A. 200
B. 250
C. 300
D. 350

AP BIO INSTA-REVIEW

TOPIC 8.3

If r = 0.5, N = 200 and K = 400, how many individuals remain after 1 generation?

B. 250

$$dN/dt = (K-N)/K$$
$$dN/dt = (400 - 200)/400$$
$$dN/dt = 200/400$$
$$dN/dt = 50$$

$$50 + 200 = 250$$

AP BIO INSTA-REVIEW

TOPIC 8.4

Effect of Density of Populations

SYI-1.H.1

A population can produce a density of individuals that exceeds the system's resource availability.

AP BIO INSTA-REVIEW

TOPIC 8.4

Effect of Density of Populations

SYI-1.H.2

As limits to growth due to density-dependent and density-independent factors are imposed, a logistic growth model generally ensues.

RELEVANT EQUATION

$$\frac{dN}{dt} = r_{max} N \left(\frac{K - N}{K} \right)$$

where:

dt = change in time

N = population size

r_{max} = maximum per capita growth rate of population

K = carrying capacity

AP BIO INSTA-REVIEW

TOPIC 8.4

What is the term for the largest population size the environment can support?

AP BIO INSTA-REVIEW

TOPIC 8.4

What is the term for the largest population size the environment can support?

Carrying Capacity

AP BIO INSTA-REVIEW

TOPIC 8.4

Which variable represents carrying capacity?

A. dN/dt

B. N

C. K

D. r

AP BIO INSTA-REVIEW

TOPIC 8.4

Which variable represents carrying capacity?

C. K

N = population size

K = carrying capacity

r = per capita rate of increase

dN/dt = change in population size

AP BIO INSTA-REVIEW

TOPIC 8.4

As K approaches N, what happened to the dN/dt?

A. Decreases, then increases

B. Decreases, then remains constant

C. Increases, then decreases

D. Increases, then remains constant

AP BIO INSTA-REVIEW

TOPIC 8.4

As K approaches N, what happened to the dN/dt?

B. Decreases, then remains constant

$$dN/dt = rN(K-N)/K$$

As N approaches K, the difference between the two gets smaller. This means the numerator will get smaller, so the rate will decrease.

AP BIO INSTA-REVIEW

TOPIC

8.4

When is dN/dt = 0?

A. N < K

B. N > K

C. N = K

AP BIO INSTA-REVIEW

TOPIC 8.4

When is dN/dt = 0?

C. N = K

$$dN/dt = rN(K-N)/K$$

If N = K, then the numerator is zero. When you multiply anything by a zero, the product is always zero.

AP BIO INSTA-REVIEW

TOPIC 8.4

Which type of factor is an earthquake?

A. Density dependent

B. Density independent

AP BIO INSTA-REVIEW

TOPIC 8.4

Which type of factor is an earthquake?

B. Density independent

An earthquake is not dependent on the density of the population. Recall, the density refers to the number of individuals in a certain area.

AP BIO INSTA-REVIEW

TOPIC 8.4

Which type of factor is a disease?

A. Density dependent

B. Density independent

AP BIO INSTA-REVIEW

TOPIC 8.4

Which type of factor is a disease?

A. Density dependent

Disease spreads more quickly when the population is more densely populated. Recall, density refers to the number of individuals in an area.

AP BIO INSTA-REVIEW

TOPIC

8.4

If N = 500, K = 250, and r = 0.1, solve for dN/dt?

A. -500

B. -50

C. 50

D. 500

AP BIO INSTA-REVIEW

TOPIC 8.4

If N = 500, K = 250, and r = 0.01, solve for dN/dt?

B. -50

$$dN/dt = rN((K-N)/K)$$

$$dN/dt = 0.1(500)((250-500)/250)$$

$$dN/dt = 50(-250/250)$$

$$dN/dt = 50(-1)$$

$$dN/dt = -50$$

AP BIO INSTA-REVIEW

TOPIC 8.4

Which of the following does not represent density?

A. Number of bacteria in a 10 mL of nutrient media

B. Number of elephants in 1 acre of savanna

C. Number of offspring in each generation

D. Number of fish in a square mile

AP BIO INSTA-REVIEW

TOPIC 8.4

Which of the following does not represent density?

C. Number of offspring in each generation

Density is the number of individuals in an area or volume.

A. Number of bacteria (NUMBER OF INDIVIDUALS) in a 10 mL of nutrient media (VOLUME)

B. Number of elephants (NUMBER OF INDIVIDUALS) in 1 acre of savanna (AREA)

D. Number of fish (NUMBER OF INDIVIDUALS) in a square mile (AREA)

AP BIO INSTA-REVIEW

TOPIC

8.4

What is the carrying capacity?

AP BIO INSTA-REVIEW

TOPIC 8.4

What is the carrying capacity?

The maximum number of individuals that the environment can support

AP BIO INSTA-REVIEW

TOPIC 8.4

What happens to the growth rate as population size approaches carrying capacity?

A. Decreases

B. Increases

C. Stay the Same

AP BIO INSTA-REVIEW

TOPIC 8.4

What happens to the growth rate as population size approaches carrying capacity?

A. Decreases

Recall, rate is slope. If you look at a logistic growth curve, you will see the curve begins to level off. This means that the growth rate **DECREASES.**

AP BIO INSTA-REVIEW

TOPIC 8.4

How do density dependent factors affect growth rate?

A. As population size increases, growth rate decreases

B. As population size increases, growth rate increases

C. As population size increases, growth rate stays the same

AP BIO INSTA-REVIEW

TOPIC 8.4

How do density dependent factors affect growth rate?

A. As population size increases, growth rate decreases

Density dependent factors depend on the density. If there is an increase in population, there will be a decrease in growth rate to keep the population size in check.

AP BIO INSTA-REVIEW

TOPIC 8.4

How do density independent factors affect growth rate?

A. As population size increases, growth rate decreases

B. As population size increases, growth rate increases

C. As population size increases, growth rate stays the same

AP BIO INSTA-REVIEW

TOPIC 8.4

How do density independent factors affect growth rate?

C. As population size increases, growth rate stays the same

Density independent factors do NOT depend on the density of the population. As the population size increases, the growth rate is unaffected because these factors are not dependent on the density.

AP BIO INSTA-REVIEW

TOPIC 8.4

Disease

A. Density dependent factor

B. Density independent factor

AP BIO INSTA-REVIEW

TOPIC 8.4

Disease

A. Density dependent factor

Disease spreads more quickly in a more densely populated area than less densely populated area. Disease is density dependent.

AP BIO INSTA-REVIEW

TOPIC 8.4

Landslide

A. Density dependent factor

B. Density independent factor

AP BIO INSTA-REVIEW

TOPIC 8.4

Landslide

B. Density independent factor

A landslide does NOT depend on the population density, so this would be considered a density independent factor.

AP BIO INSTA-REVIEW

TOPIC 8.4

If you have a population of fish in your pond of 500 and then you add 200 more fish, but the carrying capacity is 600 with a rate of increase of 0.25. What is the population size after 1 generation?

AP BIO INSTA-REVIEW

TOPIC 8.4

If you have a population of fish in your pond of 500 and then you add 200 more fish, but the carrying capacity is 600 with a rate of increase of 0.25. What is the population size after 1 generation?

$$0.25(700)((600-700)/600)$$

$$0.25(700)(-0.16)$$

$$-29.16$$

$$700 - 29.16 = 670.84$$

AP BIO INSTA-REVIEW

TOPIC 8.5

Community Ecology

ENE-4.A.1

The structure of a community is measured and described in terms of species composition and species diversity.

AP BIO INSTA-REVIEW

TOPIC 8.5

Community Ecology

ENE-4.B.1

Communities change over time depending on interactions between populations.

RELEVANT EQUATION

Simpson's Diversity Index—

$$\text{Diversity Index} = 1 - \sum\left(\frac{n}{N}\right)^2$$

n = the total number of organisms of a particular species

N = total number of organisms of all species

AP BIO INSTA-REVIEW

TOPIC 8.5

Community Ecology

ENE-4.B.2

Interactions among populations determine how they access energy and matter within a community

ENE-4.B.3

Relationships among interacting populations can be characterized by positive and negative effects and can be modeled. Examples include predator/prey interactions, trophic cascades, and niche partitioning.

AP BIO INSTA-REVIEW

TOPIC 8.5

Community Ecology

ENE-4.B.4

Competition, predation, and symbioses, including parasitism, mutualism, and commensalism, can drive population dynamics.

ENE-4.C.1

Cooperation or coordination between organisms, populations, and species can result in enhanced movement of, or access to, matter and energy

AP BIO INSTA-REVIEW

TOPIC
8.5

There's 4 different species.
What's the species richness?

A. 2
B. 3
C. 4
D. 5

AP BIO INSTA-REVIEW

TOPIC 8.5

There's 4 different species. What's the species richness?

c. 4

Species richness is the number of different species in an area.

There are 4 different species so the species richness is 4.

AP BIO INSTA-REVIEW

TOPIC 8.5

In Simpson's Index formula, what does "backward E" mean?

A. Equilibrium

B. Exponential

C. Factorial

D. Summation

AP BIO INSTA-REVIEW

TOPIC 8.5

In Simpson's Index formula, what does "backward E" mean?

D. Summation

The "Σ" means summation. You will add all the individual numbers together.

AP BIO INSTA-REVIEW

TOPIC 8.5

As predator population increases, prey population...

A. Decreases

B. Increases

C. Stay the Save

AP BIO INSTA-REVIEW

TOPIC 8.5

As predator population increases, prey population...

A. Decreases

The predator consumes the prey. If there are more predators, they will be consuming more prey so the prey population will decrease.

AP BIO INSTA-REVIEW

TOPIC 8.5

As prey population increases, predator population...

A. Decreases

B. Increases

C. Stay the Save

AP BIO INSTA-REVIEW

TOPIC 8.5

As prey population increases, predator population...

B. Increases

The predator consumes the prey. If the prey population increases, there will be more food available for the predator so the predator population will increase.

AP BIO INSTA-REVIEW

TOPIC 8.5

In a trophic structure of four organisms, what is the effect on the last one?

All 3 organisms have a negative effect on the organism below them in the chain

A. Negative

B. No effect

C. Positive

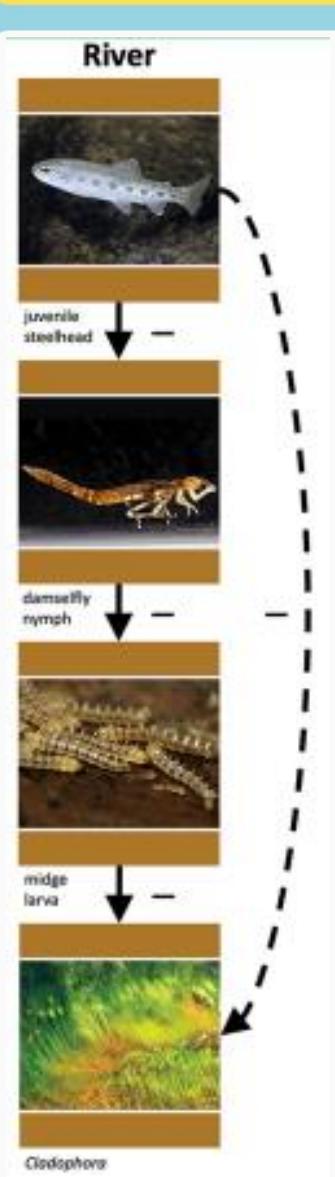
AP BIO INSTA-REVIEW

TOPIC 8.5

In a trophic structure of four organisms, what is the effect on the last one?

All 3 organisms have a negative effect on the organism below them in the chain

A. Negative



Each of the organisms has a negative impact on the organism below in the trophic structure, so overall there will be a negative effect. If there's two negative impacts, the overall impact will be positive. If there's three negative impacts, the overall impact will be negative.

AP BIO INSTA-REVIEW

TOPIC

8.5

Describe the interaction:

Competition

A. +/-

B. -/+

C. +/+

D. -/-

AP BIO INSTA-REVIEW

TOPIC 8.5

Describe the interaction: Competition

D. -/-

Competition is negative for both parties as both populations or species will be negatively impacted with less resources.

AP BIO INSTA-REVIEW

TOPIC

8.5

Describe the interaction:

Predator/Prey

A. +/-

B. -/+

C. +/+

D. -/-

AP BIO INSTA-REVIEW

TOPIC 8.5

Describe the interaction: Predator/Prey

A. +/-

The predator is benefited (received nutrients) while the prey is harmed (it is consumed by the predator).

AP BIO INSTA-REVIEW

TOPIC 8.5

Describe the interaction: Mutualism

A. +/-

B. -/+

C. +/+

D. -/-

AP BIO INSTA-REVIEW

TOPIC 8.5

Describe the interaction: Mutualism

C. +/+

Mutualism is both populations/species are benefited.

example: termites & microorganisms in gut

AP BIO INSTA-REVIEW

TOPIC 8.5

Describe the interaction: Host/Parasite

A. +/-

B. -/+

C. +/+

D. -/-

AP BIO INSTA-REVIEW

TOPIC 8.5

Describe the interaction: Host/Parasite

B. -/+

The host is negatively impacted (the parasite steals nutrients or harms the host) while the parasite is positively impacted (obtains nutrients from the host)

AP BIO INSTA-REVIEW

TOPIC

8.5

What is cooperation?

AP BIO INSTA-REVIEW

TOPIC 8.5

What is cooperation?

Interaction between organisms, populations, community to enhance movement of/access to matter and energy

AP BIO INSTA-REVIEW

TOPIC 8.5

What is a species?

A. Group of individuals that live in same area

B. Group of individuals that mate

C. Group of individuals able to mate and produce fertile, viable offspring

D. Group of individuals that look the same

AP BIO INSTA-REVIEW

TOPIC 8.5

What is a species?

C. Group of individuals able to mate and produce fertile, viable offspring

The biological species concept refers to two individuals are from the same species if they are able to interbreed and produce fertile, viable offspring.

AP BIO INSTA-REVIEW

TOPIC 8.5

What is species richness?

A. The number of different species

B. The number of individuals in a species

C. The total species that exist on Earth

D. The total money that's the species is worth

AP BIO INSTA-REVIEW

TOPIC 8.5

What is species richness?

A. The number of different species

Species richness is the number of species in an area. The more species, the more rich the area. The less species, the less rich the area.

AP BIO INSTA-REVIEW

TOPIC

8.5

Solve with Simpson's Index

Penguins = 10

Monkeys = 5

RELEVANT EQUATION

Simpson's Diversity Index—

$$\text{Diversity Index} = 1 - \sum\left(\frac{n}{N}\right)^2$$

n = the total number of organisms of a particular species

N = total number of organisms of all species

AP BIO INSTA-REVIEW

TOPIC 8.5

Solve with Simpson's Index

Penguins = 10

Monkeys = 5

$$1-[(10/15)^2 + (5/15)^2]$$

$$1-[(0.44)+(0.11)]$$

$$1-0.55$$

$$0.45$$

AP BIO INSTA-REVIEW

TOPIC 8.5

Two species are able to survive with the exact same niche

A. True

B. False

AP BIO INSTA-REVIEW

TOPIC 8.5

Two species are able to survive with the exact same niche

B. False

The competitive exclusion principle states that two species cannot survive with the exact same niche. It is favorable for the two species to undergo resource partitioning to divide up the resources to ensure both species are successful.

AP BIO INSTA-REVIEW

TOPIC 8.5

Interaction in which both organisms are harmed.

A. Competition
B. Cooperation
C. Mutualism
D. Parasitism

AP BIO INSTA-REVIEW

TOPIC 8.5

Interaction in which both organisms are harmed.

A. Competition

Competition is -/- as both individuals are harmed since they are competing for the same resource.

Cooperation is +/+

Mutualism is +/+

Parasitism is +/-

AP BIO INSTA-REVIEW

TOPIC 8.5

Interaction in which both species are benefited

A. Competition
B. Cooperation
C. Mutualism
D. Parasitism

AP BIO INSTA-REVIEW

TOPIC 8.5

Interaction in which both species are benefited

C. Mutualism

Mutualism is +/+ as both individuals are benefited since they are providing a service or resource to each other.

Competition is -/-

Cooperation is +/+

Parasitism is +/-

AP BIO INSTA-REVIEW

TOPIC 8.5

Interaction in which one species benefits and other is harmed

A. Competition
B. Cooperation
C. Mutualism
D. Parasitism

AP BIO INSTA-REVIEW

TOPIC 8.5

Interaction in which one species benefits and other is harmed

D. Parasitism

Parasitism is +/- as one is benefited (parasite) while the other is harmed (host) due to the parasite taking resources from the host.

Competition is -/-

Cooperation is +/+

Mutualism is +/+

AP BIO INSTA-REVIEW

TOPIC 8.5

What type of interaction is predator/prey?

A. +/+

B. +/-

C. +/0

D. -/-

AP BIO INSTA-REVIEW

TOPIC 8.5

What type of interaction is predator/prey?

B. +/-

The predator is positively impacted because it obtains nutrients (and food) while the prey is negatively impacted because it dies (and is consumed by the predator).

AP BIO INSTA-REVIEW

TOPIC 8.5

Predict the result if you separate two obligate mutualistic organisms.

A. No response

B. Organism 1 grows, organism 2 dies

C. Both organisms increase growth

D. Both organisms decrease growth

AP BIO INSTA-REVIEW

TOPIC 8.5

Predict the result if you separate two obligate mutualistic organisms.

D. Both organisms decrease growth

Obligate mutualistic organisms CANNOT survive without the other organism. If you were toe isolate either of these organisms, neither organism will survive.

AP BIO INSTA-REVIEW

TOPIC 8.5

Why would both organisms decline if obligate mutualistic organisms are separated?

AP BIO INSTA-REVIEW

TOPIC 8.5

Why would both organisms decline if obligate mutualistic organisms are separated?

I always tell my students they are obligated to be together.

They are unable to survive without the other. An example of this would be the microorganisms that live in the gut if a termite. If you kill the microorganism in their gut, the termite will no longer be able to digest cellulose thus it will starve as it only eats wood.

AP BIO INSTA-REVIEW

TOPIC 8.5

If two organisms share a niche, how do they both survive?

A. Competitive exclusion

B. Resource partitioning

AP BIO INSTA-REVIEW

TOPIC 8.5

If two organisms share a niche, how do they both survive?

B. Resource partitioning

Resource partitioning is a process where species will divide up the resources. This allows the species to co-exist in the same area without the competitive exclusion principle which states that two species cannot share the same niche.

AP BIO INSTA-REVIEW

TOPIC 8.6

Biodiversity

SYI-3.F.1

Natural and artificial ecosystems with fewer component parts and with little diversity among the parts are often less resilient to changes in the environment.

SYI-3.F.2

Keystone species, producers, and essential abiotic and biotic factors contribute to maintaining the diversity of an ecosystem.

AP BIO INSTA-REVIEW

TOPIC 8.6

Biodiversity

SYI-3.G.1

The diversity of species within an ecosystem may influence the organization of the ecosystem.

SYI-3.G.2

The effects of keystone species on the ecosystem are disproportionate relative to their abundance in the ecosystem, and when they are removed from the ecosystem, the ecosystem often collapses.

AP BIO INSTA-REVIEW

TOPIC
8.6

Which type of community is more resilient to chance?

A. Less diversity & fewer parts

B. Lass diversity & more parts

C. More diversity & fewer points

D. More diversity & more parts

AP BIO INSTA-REVIEW

TOPIC 8.6

Which type of community is more resilient to chance?

D. More diversity & more parts

Chance are random environmental changes that might occur. The more diversity allows for the favorable characteristic to be present in the ecosystem.

AP BIO INSTA-REVIEW

TOPIC
8.6

Keystone species have a...

A. Disproportionate affect relative to abundance

B. Proportionate affect relative to abundance

AP BIO INSTA-REVIEW

TOPIC 8.6

Keystone species have a...

A. Disproportionate affect relative to abundance

A keystone species is a species on which other species in an ecosystem largely depend, such that if it were removed the ecosystem would change drastically.

Example: The sea otter maintains the kelp forest

AP BIO INSTA-REVIEW

TOPIC 8.6

What happens if a keystone species is removed...

A. Community becomes more diverse

B. Ecosystem collapses

C. No effect due to minor role

D. Population becomes less diverse

AP BIO INSTA-REVIEW

TOPIC 8.6

What happens if a keystone species is removed...

B. Ecosystem collapses

A keystone species is a species on which other species in an ecosystem largely depend, such that if it were removed the ecosystem would change drastically which affects the existing food web and the ecosystem could collapse.

AP BIO INSTA-REVIEW

TOPIC 8.6

Which of these does not contribute to maintain diversity?

A. Decomposer

B. Essential abiotic/biotic factor

C. Keystone species

D. Producer

AP BIO INSTA-REVIEW

TOPIC 8.6

Which of these does not contribute to maintain diversity?

A. Decomposer

This is directly from the CED. Diversity refers to the species richness and the relative abundance. A decomposer will break down detritus (decomposing materials).

AP BIO INSTA-REVIEW

TOPIC
8.6

What type of environment is resistant to change?

A. Low diversity, low component parts
B. High diversity, low component parts
C. Low diversity, high component parts
D. High diversity, high component parts

AP BIO INSTA-REVIEW

TOPIC 8.6

What type of environment is resistant to change?

D. High diversity, high component parts

A high diversity will allow for the favorable characteristic to be present in the ecosystem.

AP BIO INSTA-REVIEW

TOPIC 8.6

If the keystone species is removed what happens?

A. Their predator population increases

B. Their predator population decreases

C. The ecosystem collapses

D. The ecosystem stabilizes

AP BIO INSTA-REVIEW

TOPIC 8.6

If the keystone species is removed what happens?

C. The ecosystem collapses

The sea otter is a keystone species. When the sea otter is removed, the sea urchins that the sea otters prey upon increases in population which destroys the kelp forest. The sea otter keeps the sea urchin population in check so the kelp forest can be maintained.

AP BIO INSTA-REVIEW

TOPIC 8.6

Abiotic factors

A. Factor that causes living organism to die

B. Factor that causes living organisms to reproduce

C. Living factor

D. Nonliving factor

AP BIO INSTA-REVIEW

TOPIC 8.6

Abiotic factors

D. Nonliving factor

Abiotic factors are nonliving factors while biotic factors are living factors.

AP BIO INSTA-REVIEW

TOPIC 8.6

Predators are an example of

A. Abiotic factors

B. Biotic factors

AP BIO INSTA-REVIEW

TOPIC 8.6

Predators are an example of

B. Biotic factors

Predators prey upon the other organisms. Since the predators are living and affect the prey population, they would be considered a biotic factor.

AP BIO INSTA-REVIEW

TOPIC
8.6

What happens if sea otters decrease?

A. Sea urchins increase, kelp increases
B. Sea urchins decrease, kelp increases
C. Sea urchins increase, kelp decreases
D. Sea urchins decrease, kelp decreases

AP BIO INSTA-REVIEW

TOPIC 8.6

What happens if sea otters decrease?

C. Sea urchins increase, kelp decreases

Sea otters eat sea urchins and sea urchins eat kelp. If the sea otter population decreases, the sea urchin population will increase which will decrease the kelp population.

AP BIO INSTA-REVIEW

TOPIC 8.7

Disruptions to Ecosystems

EVO-1.0.1

An adaptation is a genetic variation that is favored by selection and is manifested as a trait that provides an advantage to an organism in a particular environment.

EVO-1.0.2

Mutations are random and are not directed by specific environmental pressures.

AP BIO INSTA-REVIEW

TOPIC 8.7

Disruptions to Ecosystems

SYI-2.A.1

The intentional or unintentional introduction of an invasive species can allow the species to exploit a new niche free of predators or competitors or to outcompete other organisms for resources.

SYI-2.A.2

The availability of resources can result in uncontrolled population growth and ecological changes

AP BIO INSTA-REVIEW

TOPIC 8.7

Disruptions to Ecosystems

SYI-2.B.1

The distribution of local and global ecosystems changes over time.

SYI-2.B.2

Human impact accelerates change at local and global levels–

a. The introduction of new diseases can devastate native species.

b. Habitat change can occur because of human activity.

AP BIO INSTA-REVIEW

TOPIC 8.7

Disruptions to Ecosystems

SYI-2.C.1

Geological and meteorological events affect habitat change and ecosystem distribution. Biogeographical studies illustrate these changes.

AP BIO INSTA-REVIEW

TOPIC
8.7

An adaptation is...

A. Favored by selection and provides no advantage in environment

B. Favored by selection and provides advantage in environment

C. Not favored by selection and provides no advantage in environment

D. Not favored by selection and provides advantage in environment

AP BIO INSTA-REVIEW

TOPIC 8.7

An adaptation is...

B. Favored by selection and provides advantage in environment

Adaptations are characteristics of organisms that allow them to be more favorable to survive in a certain environment. These traits have been selected for by natural selection over many years.

AP BIO INSTA-REVIEW

TOPIC

8.7

Why do invasive species have exponential growth?

AP BIO INSTA-REVIEW

TOPIC 8.7

Why do invasive species have exponential growth?

No natural predators

Unlimited resources (no competitors or outcompeted)

AP BIO INSTA-REVIEW

TOPIC 8.7

What is the disadvantage of adding N and P with fertilizers?

AP BIO INSTA-REVIEW

TOPIC 8.7

What is the disadvantage of adding N and P with fertilizers?

Run off leads to eutrophication

AP BIO INSTA-REVIEW

TOPIC 8.7

What is a mutation?

A. Change in amino acid sequence

B. Change in cell types

C. Change in DNA

D. Change in polypeptide

AP BIO INSTA-REVIEW

TOPIC 8.7

What is a mutation?

C. Change in DNA

Yes, I agree if there's a change in DNA, there will be a change in the amino acid/polypeptide. The change did not originate in the protein, so that's the result of the mutation. The official definition of a mutation is a change in the DNA.

AP BIO INSTA-REVIEW

TOPIC 8.7

When the mutation allows the organism to better match its environment?

A. Adaptations
B. Carrying capacity
C. Conformer
D. Imprinting

AP BIO INSTA-REVIEW

TOPIC 8.7

When the mutation allows the organism to better match its environment?

A. Adaptations

Adaptations are characteristics that allow an organism to be more favorable in their environment. These adaptations result from mutations then natural selection acting on the population.

AP BIO INSTA-REVIEW

TOPIC 8.7

Why are invasive species "favorable"?

A. No natural predators

B. Unlimited resources

C. Uncontrolled growths

D. All of the above

AP BIO INSTA-REVIEW

TOPIC 8.7

Why are invasive species "favorable"?

D. All of the above

With no natural predators, their population is not kept in check, and they are able to undergo exponential growth.

With unlimited resources, their population does not need to compete to obtain enough resources which allows for exponential growth.

Due to the above two reasons, the population undergoes uncontrolled growths.

AP BIO INSTA-REVIEW

TOPIC 8.7

Which population growth curve do invasive species have?

A. C shape

B. J shape

C. S shape

D. W shape

AP BIO INSTA-REVIEW

TOPIC 8.7

Which population growth curve do invasive species have?

B. J shape

The J shape curve shows exponential growth. Since the invasive species has exponential growth due to absence of predators and unlimited resources, this population has a J shape growth curve.

AP BIO INSTA-REVIEW

TOPIC 8.7

Invasive species can out compete native species.

A. True

B. False

AP BIO INSTA-REVIEW

TOPIC 8.7

Invasive species can out compete native species.

A. True

This is one of the issues with invasive species. Due to the presence of the invasive species with unlimited resources and no natural predators, they are able to outcompete native species which changes the diversity of the ecosystem.