

Oklahoma Biology Science Framework

Activity (Part 1: accumulation – interconnections)

For each word listed in the left column, find a sentence in the text containing that word. Copy the complete sentence in the space provided. Underline the vocabulary word in your sentence.

Example

Genetic	Within populations, small modifications occur at the genetic level (in DNA) with each generation, and these genetic changes can affect how the organism interacts with its environment.
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Word List

accumulation	
accurately	
acids	
acquired	
across	
adaptation	
Adaptive	
advantageous	

Student Name _____

Date _____

affect	
air	
amino	
among	
amount	
anatomical	
animal	
animals	
another	
apart	
appears	
aquatic	

Student Name _____

Date _____

attack	
available	
balance	
become	
beginning	
behavior	
behavioral	
behaviors	
below	
best	
better	
bigger	

Student Name _____

Date _____

biomass	
carbohydrates	
Carbon	
carnivores	
cell	
Cells	
Cellular	
certain	
chain	
chance	
change	
characteristics	

Student Name _____

Date _____

chemicals	
circumstances	
climate	
combinations	
combine	
compete	
competition	
complex	
complexity	
components	
composed	
compounds	

Student Name _____

Date _____

conditions	
connected	
constantly	
contribute	
copying	
course	
create	
created	
creating	
creation	
current	
Cycling	

Student Name _____

Date _____

Decomposers	
decreasing	
depend	
dependent	
depending	
depict	
Despite	
destroyed	
determined	
develop	
developed	
differences	

Student Name _____

Date _____

dioxide	
distinguish	
distribution	
diversity	
divide	
DNA	
down	
during	
dynamic	
Dynamics	
earth	
eaten	

Student Name _____

Date _____

Ecosystem	
Ecosystems	
encoded	
Energy	
ensure	
entire	
entirely	
environment	
environmental	
Environmentally	
equally	
errors	

Student Name _____

Date _____

eventually	
Evolution	
example	
exists	
exposure	
expressed	
factors	
flow	
Food	
forces	
form	
frequency	

Student Name _____

Date _____

function	
gametes	
generation	
generations	
Genes	
Genetic	
Genetics	
global	
group	
growth	
habitat	
herbivores	

Student Name _____

Date _____

herding	
Heredity	
homeostasis	
Humans	
identical	
individual	
influences	
information	
inherit	
instructions	
interacts	
interconnections	

Oklahoma Biology Science Framework

Activity (Part 2: lead - work)

For each word listed in the left column, find a sentence in the text containing that word. Copy the complete sentence in the space provided. Underline the vocabulary word in your sentence.

Example

Genetic	Within populations, small modifications occur at the genetic level (in DNA) with each generation, and these genetic changes can affect how the organism interacts with its environment.
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lead	
less	
level	
life	
light	
likely	
limited	
limiting	

Student Name _____

Date _____

living	
longer	
lower	
made	
maintain	
major	
make	
material	
matter	
may	
mechanism	
mechanisms	

Student Name _____

Date _____

mistakes	
modifications	
molecular	
molecules	
multiple	
mutation	
natural	
nature	
need	
network	
new	
next	

Student Name _____

Date _____

nutrients	
occur	
occurring	
occurs	
offspring	
often	
one	
order	
organism	
Organisms	
organized	
organs	

Student Name _____

Date _____

organ-systems	
overcome	
oxygen	
parent	
passed	
periods	
photosynthesis	
physical	
place	
plant	
population	
possesses	

Student Name _____

Date _____

power	
predator	
predators	
predict	
pressures	
prevalent	
prey	
probability	
process	
Proteins	
provide	
rates	

Student Name _____

Date _____

recombine	
related	
relationships	
repair	
repeatedly	
reproduce	
reproduction	
require	
resource	
Resources	
respiration	
resulting	

Student Name _____

Date _____

returning	
Selection	
sequence	
sequences	
share	
shelter	
shifting	
show	
siblings	
similar	
simplified	
size	

Student Name _____

Date _____

small	
social	
soil	
source	
space	
speciation	
species	
specific	
statistics	
stronger	
structure	
success	

Student Name _____

Date _____

sugar	
suited	
sunlight	
survival	
survive	
sustain	
system	
temperature	
things	
time	
tissues	
together	

Student Name _____

Date _____

trait	
transferred	
transformed	
tremendous	
ultimately	
ultraviolet	
uncorrected	
under	
undetected	
unit	
upon	
variation	

Student Name _____

Date _____

varying	
water	
web	
whole	
work	

Text (Passages)

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Adaptations

Over the course of time, species with traits or characteristics that are better suited for them to survive in a habitat, are likely to have more success than those that have traits or characteristics that are less suited to a habitat.

When an organism has a trait that makes it better suited to the environment, it is called an adaptation.

An adaptation is a mutation, or genetic change, that helps an organism, such as a plant or animal, survive in its environment.

Due to the helpful nature of the mutation, it is passed down from one generation to the next.

As more and more organisms inherit the mutation, the mutation becomes more prevalent in the population.

The mutation has become an adaptation.

Adaptive traits can be physical or behavioral.

Social or group behaviors often develop in populations as a way to overcome limiting factors.

For example, herding behavior has developed in many prey species.

Herding increases the chance of the individual animal to survive a predator's attack and has thus developed as an adaptation to predators in their environment.

1. Changes in the frequency of traits occur over generations as a result of environmental forces.
2. In natural selection, organisms that are best suited (not just bigger or stronger) for the current environmental conditions will survive and reproduce.
3. Variation exists across a single species.
4. In natural selection organisms that are best suited (not just bigger or stronger) for the current environmental conditions will survive and reproduce.
5. Genetic variations in a population result in some organisms having more advantageous traits.

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Heredity

Characteristics of living things are often passed down from parents to offspring, but there are variations from offspring to parent leading to multiple sources of variation within populations.

Variation in individuals can result from different combinations of the genetic material of parents.

This is why most siblings do not look identical to each other or to their parents.

Individual variation can also be caused by errors made while cells are copying genetic material (DNA).

Cells have mechanisms to check for mistakes, but some mistakes go undetected or uncorrected, resulting in a change in the genetic material.

Environmental factors, like temperature, ultraviolet light, and exposure to some chemicals, also cause individual variation.

Factors that affect the variation of traits also affect the probability of traits occurring within a population.

Statistics and probability can be used to predict the distribution of expressed traits in a population.

1. DNA in molecules of organisms affects both the structure and function of the organism's cells.
2. Environmentally acquired traits are not passed from parent to offspring; however environmental effects to gametes may cause changes in offspring.
3. Genes are expressed as traits

Molecular Genetics

Molecules called DNA are the instructions that all living organisms use to create all of the characteristics and traits it possesses. Cellular structures use the DNA as instructions for expressing traits that are passed down from parents to offspring.

Highly similar DNA sequences lead to anatomical similarities, while differences in DNA sequences contribute to the diversity of living things.

1. Genetic information is encoded in DNA molecules.
2. This information influences an organism's physical traits and behavior.
3. Proteins are made up of amino acids, the sequence of which is determined by the organism's DNA sequence.

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Natural Selection

All living organisms on earth show tremendous differences of form and function.

Despite this diversity, all organisms share certain characteristics that distinguish them from non-living things.

Within populations, small modifications occur at the genetic level (in DNA) with each generation, and these genetic changes can affect how the organism interacts with its environment.

Over time, accumulation of these genetic changes can alter the characteristics of the whole population, and a new species appears.

Major changes in life forms take place by the same mechanism, but over even longer periods of time.

1. Changes in the frequency of traits occur over generations as a result of environmental forces.
2. Changes in the frequency of traits occur at different rates, at different times depending on the environmental pressures.
3. Environmentally acquired traits are not passed from parent to offspring; however environmental effects to gametes may cause changes in offspring.
4. Selection is related to both survival and reproduction success.
5. Variation exists across a single species.
6. Evolution through natural selection can sometimes, but not always lead to speciation.

Cellular Systems

Cells are the smallest unit of life.

Each cell has a specific structure and function.

Cells work together to carry out more and more complex functions in order to sustain life.

These cells may be organized into larger structures or systems beginning with tissues and increasing in size and complexity to maintain organs, organ-systems, and eventually an organism.

These structures can maintain balance (homeostasis) within an organism to ensure their survival.

These structures are all dependent upon one another and any change within one structure can affect the functioning of other structures.

1. All living things are composed of one or more cells.
2. Cells in multi-cellular organisms repeatedly divide to make more cells for growth and repair

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Ecosystem Dynamics

Ecosystems are constantly changing.

These changes can be a result of shifting living (predators, competition, and available food) and non-living (shelter, water, and climate) factors within a specific environment.

Under most circumstances these factors ensure that a natural “balance” is maintained within a specific ecosystem.

However, changes to one or more of these factors can result in an ecosystem breaking down or ultimately the creation of an entirely new ecosystem.

1. All organisms, both land-based and aquatic, are connected to other organisms by their need for food.
2. This results in a global network of interconnections, which is referred to as a food web.
3. Changes to any one part of the food web can have varying effects on the entire food web.
4. All organisms are important within an ecosystem.
5. Varying a species' population size may not affect all other species equally, but it will affect the ecosystem as a whole.
6. All organisms are important within an ecosystem.
7. Varying a species' population size may not affect all other species equally, but it will affect the ecosystem as a whole.
8. Organisms higher in a food chain eat some, but not necessarily all, of the organisms below them in the food web.
9. Food webs most accurately depict the flow of energy within an ecosystem.
10. They depict a complex set of relationships that are dynamic in nature.
11. In all environments, individual organisms that depend on the same resource may compete for that resource when it is limited.
12. Resources that can be limited include food, space, water, shelter, and light.

Cycling of Energy

The processes of photosynthesis (making oxygen and sugar, done in plants) and cellular respiration (making energy from sugar, done in plants and animals) provide most of the energy for life on earth.

1. Carbon dioxide is used during photosynthesis to make sugar used a food/energy source for plants.
2. The biomass in plants comes from carbon from carbon dioxide taken in from the air

DO NOT WRITE ON THIS PAGE**Cycling of Matter**

Molecules combine and break apart and recombine to form necessary compounds for life.

These include: sugars, amino acids, proteins, and carbohydrates.

The process of creating these compounds is done by plants and animals at a cellular level.

It also occurs in systems in our food.

1. Plants create their own food using sunlight and carbon dioxide through photosynthesis.
2. Energy cannot be created or destroyed, but is transformed or transferred within a system.
3. Organisms higher in a food chain eat some, but not necessarily all, of the organisms below them in the food web.
4. Food webs most accurately depict the flow of energy within an ecosystem.
5. They depict a complex set of relationships that is not easily simplified to a food chain.
6. Energy is transferred among all components of a food web.
7. Organisms at the top of a food web typically require more energy than those lower in the food web.
8. While some carnivores may be larger and require more food than some herbivores, they do not have more energy or power.
9. There are more herbivores than carnivores because of the decreasing amount of energy available at each level of the food web.
10. Decomposers break down dead organisms, returning nutrients to the soil so they can be used by plants.
11. Some decomposers are eaten by carnivores.
12. Humans (and all other animals) are dependent on plants.
13. Carbon dioxide is used during photosynthesis to make sugars used for food