1/2/2020

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Brooklyn Ascend Middle School

LE Science Break Packet

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Due Date:

Vocabulary Review

|  |  |
| --- | --- |
| **Term** | **Definition** |
| abiotic | non-living things |
| active transport | movement of molecules from a low concentration to a high concentration that requires no energy  |
| amino acids | organic molecules used by living organisms to make proteins |
| antibiotics  | a medicine that slows down the growth of bacteria  |
| asexual reproduction | biological process by which an organism creates a genetically similar copy of itself without the combination of genetic material with another organism |
| biotic  | living things  |
| biodiversity | **biological diversity in an environment** as indicated by numbers of different species of plants and animals. |
| Cell | the basic structural and functional unit of all organisms |
| Chloroplast | unique structures found in plant cells that specialize in converting sunlight into energy that plants can use |
| Chromosome | one of the rod-shaped or threadlike structures of a cell nucleus that contains genes and divides when the cell divides |
| Deletion | a deletion mutation can remove a single nucleotide, or entire sequences of nucleotides |
| dependent variable  | variable that is being measured at the end of the experiment, the result  |
| diffusion  | movement of molecules from a high concentration to a low concentration |
| Diploid | an organism or cell having two sets of chromosomes or twice the haploid number |
| DNA | the molecule that contains the genetic code of organisms |
| Egg | animal reproductive body consisting of an ovum or embryo together with nutritive and protective envelopes |
| Endocytosis | the process of capturing a substance or particle from outside the cell by engulfing it with the cell membrane and bringing it into the cell |
| Fertilization | the joining of an egg and a sperm |
| Fetus | an animal not yet born or hatched, but more developed than an embryo |
| Gamete | the male or female reproductive cell that contains half the genetic material of the organism |

|  |  |
| --- | --- |
| **Term** | **Definition** |
| genes | the basic unit of heredity; a specific sequence of nucleotides in DNA or RNA that is usually located on a chromosome |
| haploid | an organism or cell having only one complete set of chromosomes |
| heredity | the passing on of characteristics from parents to offspring |
| homeostasis  | a balanced state in an organism  |
| hormone  | a substance that acts as a chemical signal secreted by different glands in the body  |
| Independent variable  | variable that is being tested |
| inherited trait | a quality or characteristic that can be passed through the genes from one generation to the next |
| insertion | the insertion of one or a few [nucleotides](https://www.bing.com/search?q=Nucleotide&filters=sid%3a53b9ce42-1feb-c6d3-52be-8089758ca708&form=ENTLNK) into the DNA sequence |
| Learned (acquired) trait | a quality or characteristic that can be learned and is taught to you |
| meiosis | cell division that produces reproductive cells in sexually reproducing organisms |
| mitochondria | organelle responsible for cellular respiration |
| mitosis | process by which a single cell divides into two identical daughter cells (cell division) |
| mutation | a change in a living thing's DNA |
| nucleus | a part of the cell containing DNA and RNA and responsible for growth and reproduction; main control center of the cell |
| offspring | the product of the reproductive processes of an animal or plant |
| organism | a living thing |
| osmosis  | the diffusion of water into or out of the cell  |
| ovum | the haploid female reproductive cell, or gamete |
| pH | a scale that measures the strength of acids and bases  |
| placenta | a temporary organ that transfers nutrients and oxygen from the mother’s blood into the blood of the fetus through the process of diffusion  |
| recombination | the rearrangement of genetic material, especially by crossing over in chromosomes or by the artificial joining of segments of DNA from different organisms. |
| replication | the process by which DNA makes a copy of itself during cell division |
| reproduction | the process by which a living organism creates a likeness of itself |
| sexual reproduction | the process of creating a new individual by two parent organisms |
| somatic cell | any cells of a plant or animal except the reproductive cells; a cell that does not participate in the production of gametes |
| sperm | male reproductive cells |
| stem cells | cells that are not specialized and are therefore able to produce cells of other types |
| substitution | nucleotide or sequence of nucleotides in the wrong position |
| trait | a characteristic or quality |
| variation | any difference between cells, individual organisms, or groups of organisms of any species caused either by genetic differences or by the effect of environmental factors on the expression of the genetic potentials |
| zygote | a cell formed by the union of two gametes |

1. Separate the terms into the chart below:

**worms, dirt, grass, bacteria, soil, sun, fertilizer**

|  |  |
| --- | --- |
| Abiotic factors | Biotic factors  |
|  |  |

1. Fill in the blank
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ need to communicate in order for homeostasis to be maintained.
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a substance that acts as a chemical messenger and plays a vital role in the communication between cells.
4. Reproductive cells such as sperm cells contain only \_\_\_\_\_\_\_\_\_\_\_ the genetic information necessary for the formation of an offspring.
5. An offspring exposed to radiation can cause a mutation only if it occurs in the \_\_\_\_\_\_\_\_\_\_\_\_ of their parents.
6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reproduction results in the offspring without the union of gametes.
7. Match the macromolecule to the correct monomer
8. Nucleic Acid \_\_\_\_\_ Fatty acid
9. Lipids \_\_\_\_\_ Amino acids
10. Proteins \_\_\_\_\_ Nucleotides
11. Carbohydrates \_\_\_\_\_ Monosaccharides
12. Organize the terms below from least complex to most complex

Organism, cells, genes, organs, chromosomes, tissue, 4 types of base subunits

\_\_\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_\_\_

1. Use the key and diagram below to represent sodium molecules actively transporting outside the cell.

This process also requires the use of \_\_\_\_\_\_.

|  |
| --- |
| **Key** |
| + Sodium molecules  |

1. Match the organelles with the correct function
2. Cell membrane controls the activity of the cell and contains DNA
3. Mitochondria allows substances to past in and out the cell
4. Ribosome assembles the protein
5. Nucleus performs the process of cellular respiration
6. Based on the diagram below explain what immediately happens after fertilization in sexual reproduction.



\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Based on the options below indicate if it represents **asexual reproduction (AS)** or **sexual reproduction (S)**

Variation

Proliferation

Identical offspring

Mutation

Increased adaptations

Decreased biodiversity within a species

1. Baby gorillas who have been raised in isolation from members of their species beat their chest whenever they perceive a threat or danger, which is a characteristic of their species. This suggests that the chest beating behavior is a genetically inherited trait from its parent.

Provide at least 3 examples of inherited and learned (acquired) traits of humans below:

**Inherited traits**

1.

2.

3.

**Learned (acquired) trait**

1.

2.

3.

1. A biological process that occurs in both plants and animals is shown below. Label the process and both its **reactants** and **products** below based on the letters (A-D).

C

 ATP

 A + B 🡪 + D + H2O

Process \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Why is the products **(D, H2O, and ATP)** important to organisms?

D – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

H2O – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ATP - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. A process that uses sunlight and occurs in the chloroplast of a specialized cell is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

List the **reactants** of this process

1.

2.

3.

List the **products** of this process

1.

2.

1. Based on the normal sequence list the type of mutation below using the terms:

**Insertion, Substitution, Deletion**

Normal sequence

 GTAATCTTG

Mutation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

GAATCTTG

Mutation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

CTAATCTTG

Mutation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

GTACATCTTG

1. A scientist designed an experiment to determine if pH had an effect on the rate of the enzyme pepsin in the stomach ability to function.

Independent variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Dependent variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



Pepsin is an enzyme found in the stomach. Pepsin can survive in very acidic environments.

Pepsin pH = 1.5 – 4.0

1. Label the x-axis
2. Draw the correct slope
3. Why do you think the stomach is very acidic?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

pH

Relative Activity

On the table below draw a slope that represents an enzyme that decreases in both acidic and basic environment and label the x-axis.

pH

Relative Activity

1. Explain how the cell is able to make the many different proteins it needs. **(Your answer must include the terms: nucleus, chromosomes, DNA, amino acids, and ribosomes)**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. How is the mitochondria’s roll important to the survival of the cell?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Cells communicate by sending and receiving signals. Signals may come from the environment, or they may come from other cells. In order to trigger a response, these signals must be transmitted across the cell membrane. Many signals are transmitted into a cell by first binding to a receptor protein. **Draw an appropriate structure on the membrane that allows cells to communicate below.**



1. A beaker containing an artificial cell containing glucose and starch solution is placed in water with starch indicator. **Answer the questions below:**

The artificial cell after 2 hours turned blue-black because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

After another 2 hours the color of the liquid in the beaker did not change because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

This would demonstrate the process of

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Based on the four tools below label their name, function, and units

    

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tool number**  | 1 | 2 | 3 | 4 |
| **Tool name** |  |  |  |  |
| **Tool function** |  |  |  |  |
| **Tool units** |  |  |  |  |