

Name: Answer Key

Living Environment Regents Review

Cells

1. Put the following in order from smallest to largest.

Organ cell organism tissue organelles organ system

Organelle - cell - tissue - Organ - organ system - organism

2. Parts of a cell. Fill in the table.

Cell Organelle (carry out SPECIFIC functions)	Function
nucleus	"Brain"; Controls cells activities; DNA
mitochondria	Energy ; ATP
chloroplast	Plants only ; Site of photosynthesis
cell (plasma) membrane	Semi-permeable
ribosomes	Makes proteins
vacuoles	Storage

3. Draw and label a cell membrane.



4. Transport across a cell membrane. Fill in the chart.

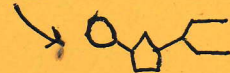
Type of transport	Movement	ATP used?
Diffusion	High → Low	No
Active Transport	Low → High	YES

5. Small (size) particles like Glucose will diffuse through a cell membrane while large (size) particles like Starch will NOT diffuse through through a cell membrane.

Macromolecules

1. Inorganic compounds do NOT contain Carbon. The most common inorganic compound is water.
2. Organic compounds contain carbon and hydrogen.
3. 4 Organic Compounds. Fill in the chart.

Macromolecule	Building Blocks	Function	Examples
Carbohydrates	Simple Sugars	Stores energy	Glucose - monosaccharide Starch - Polysaccharide
Proteins	amino acids	Growth & Repair	Enzyme
Lipids	3 fatty acids & 1 glycerol		fats & oils
Nucleic Acids	Nucleotides	Genetic Code; Hereditary Information	RNA; DNA

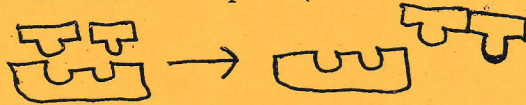
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Enzymes

1. Enzymes are a special type of Proteins that affect the rate of chemical reactions.
2. Three things that effect enzyme activity are pH, temperature, and amount of substrate. Draw a graph that shows how enzymes reaction rates are affected by the above 3 things.



3. Draw and label the 2 parts (substrate & catalyst) of the "lock and key" concept for enzyme activity.



4. Enzymes end in what 3 letters? -ase Another name for an enzyme? Catalyst
5. Enzymes have SPECIFIC shapes, if they lose their shape it is called denaturation

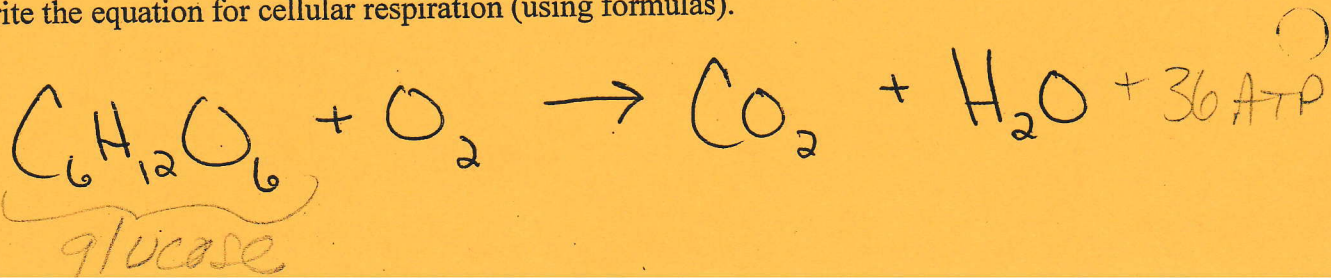
Photosynthesis

1. What organisms carry out photosynthesis? Producers (autotrophs) Where does photosynthesis occur? Chloroplasts
2. Write the equation for photosynthesis (using formulas) and label the inorganic raw materials and the organic product.



Cellular Respiration

1. Cellular respiration takes place in the mitochondria to produce ATP.
2. Write the equation for cellular respiration (using formulas).



3. Two types of cellular respiration are aerobic (oxygen) and anaerobic (NO oxygen)
4. Two types of anaerobic respiration are lactic (muscle cells) and Alcohol (yeast)

Cell Growth and Division

1. Mitosis and Meiosis. Fill in the chart.

Cell Division	Reproduction sexual or asexual	Daughter Cells identical or 1/2	Type of cells it occurs in sex cells (gametes) or body cells
Mitosis	asexual	identical	Body Cells
Meiosis	sexual	1/2	Sex Cells

2. Mitosis is needed for growth and tissue repair. Another name for mitosis is Cloning, asexual
3. Name the phases of the cell cycle? (clue: I PMAT)
Interphase, Prophase, Metaphase, Anaphase, Telophase
 (not part of mitosis; when DNA is replicating)
4. Male gametes are called Sperm and female gametes are called eggs. A fertilized egg is called a Zygote.
5. During early stages of development, the cell divides by mitosis and each cell undergoes differentiation. (Each cell becomes different from one another and leads to the formation of specialized cells.)

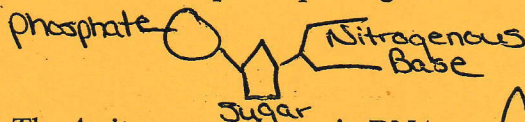
Genetics

1. The nucleus contains DNA that provides hereditary information. (genes are found on chromosomes in the nucleus)

2. What is the shape of DNA and who are the 2 scientist that discovered it?

Double helix; Watson & Crick

3. DNA is made up of repeating units of nucleotides. Draw a nucleotide and label the 3 parts.



4. The 4 nitrogenous bases in DNA are Cytosine pairs with Guanine and Adenine pairs with Thymine.

5. A change in DNA is called a mutation. This can be caused by Sun radiation or Toxins, poisons, chemicals.

6. RNA has the adenine, cytosine, and guanine BUT does not have Thymine. Instead, it has the base Uracil. (DNA and RNA also have different sugars; Deoxyribose and Ribose.)

7. During protein synthesis DNA passes its code to mRNA then to tRNA forming an amino acid sequence that builds a protein. Transcription is when DNA passes the code to mRNA in the nucleus.

Translation is when mRNA passes the code to tRNA on the ribosome.

8. Genetic engineering (biotechnology) is when you insert a desired piece of human DNA into a plasmid from a bacteria. The new DNA is called recombinate DNA. The human DNA is removed and reattached to the plasmid by the action of enzymes. (Most commonly used to make insulin and growth hormones.)

9. What is the process used for 100's of years to produce plants and animals with the most desirable traits?

Selective breeding

Evolution

1. Evolution is the process by which organisms change over time. The scientist that supported the theory of evolution with the concepts of Natural Selection and Survival of the Fittest was Darwin.

- BEST fit organisms survive and pass their traits to their offspring.
- VARIATION amongst a species is good for survival of the species.

2. The failure for a species to adapt to a changing environment may result in the extinction (disappearance) of an entire species.

3. Evidence of Evolution

- Fossils
- Biochemistry: comparing Amino Acid sequences between different organisms
- Anatomy: homologous structures
- Embryology

4. Organisms are named using a two name-naming system called **binomial nomenclature**.

The 1st name is the organisms genus; the 2nd name is the organisms species.

Protists

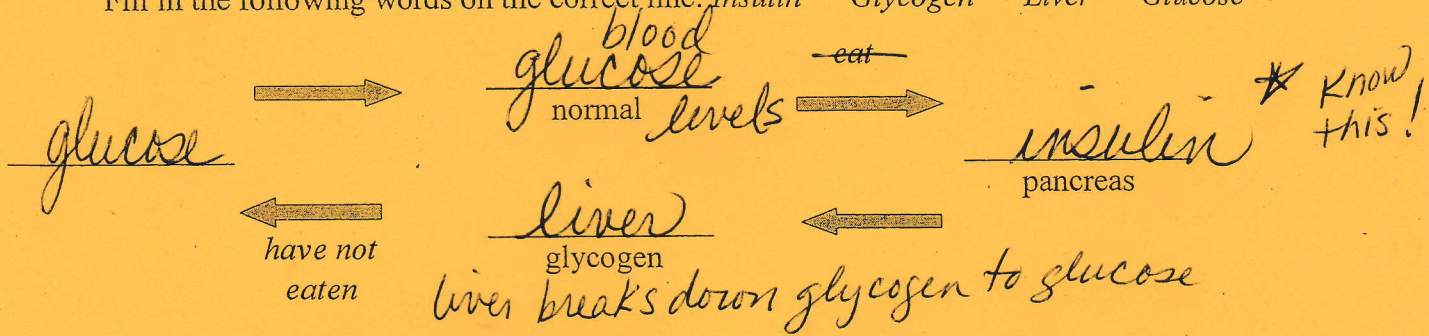
1. Protists are single celled organisms that contain organelles to sustain life; similar to human organs. What organelles in a protist would be similar to an organ in the human body?

Human Systems

1. **Nervous System:** Neurons are nerve cells that sense stimuli from surroundings, monitor, and give feedback to your brain to respond accordingly.
2. **Digestive System:** Break down and absorbs nutrients like glucose, amino acids, and lipids.
3. **Excretory System:** Rids body of waste. Organs include kidneys, liver, and skin (sweat).
4. **Endocrine System:** HORMONES – chemical messengers of the body
5. **Respiratory System:** Brings in oxygen for cellular respiration and gets rid of CO₂ during cellular respiration.
6. **Reproductive System:** Male: testes produce testosterone which is responsible for sperm production; Female: ovaries produce estrogen which develops the egg or ovum.

7. A **feedback mechanism** involves a cycle in which output of a system "feeds back" to either modify or reinforce the action taken by the system.

Fill in the following words on the correct line: *Insulin* *Glycogen* *Liver* *Glucose*



8. What is a vaccine?

weaken or dead form of a virus

9. What is the function of the following cells:

Plasma:

Red Blood Cells:

Platelets:

White Blood Cells:

Ecology

1. Ecology is the interaction of living (biotic) and non-living (abiotic) things in the environment.

2. The main source of energy for ALL living things is the Sun.

3. Fill in the following words with the correct definition:

community *biome* *species* *biosphere* *ecosystem* *population*

- biosphere On earth where all life exists.
- biome Group of ecosystems.
- ecosystem The living and nonliving factors in a particular location.
- community MANY species in a certain area.
- population ONE species in a certain area.
- species Organisms that can interbreed and produce fertile offspring.

4. Autotrophs are also known as producers. They produce their own food through the process of photosynthesis.

5. Heterotrophs are also known as consumers. They rely on other organisms to consume their food.

6. What do the following organisms eat or do in the food chain?

Herbivore: plants

Carnivore: meat

Omnivore: plants & meat

Scavenger: dead

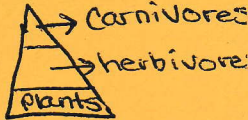
Decomposer: _____

7. Draw a food chain for the following animals. (Label the organism that is a heterotroph, carnivore, and autotroph.)

rabbit wolf grass

grass → rabbit → wolf

8. Draw a food pyramid for the following organisms: Carnivores, Plants, Herbivores (The largest biomass on the pyramid is at the bottom level.)



9. The natural change in the environment over time from a bare field to a forest is called:

ecological succession

10. **Global Warming:**

How is it caused?

CO₂ from pollution → from burning of fossil fuels (oil, gas)

An increase in what gas causes it?

CO₂
How is it harming the Earth?

Killing animals; plants; climate changes

What can we do to slow it down?

Recycle; Reduce Pollution; New forms of energy

11. **Ozone Layer:**

What causes it?

CFC's emissions; Given off by refrigerants (air conditioners; aerosols)

Why is this layer important?

Absorbs harmful UV Rays

12. **Human Impact:**

What human activity has the biggest impact on the environment?

Population increase
What things do humans do to disrupt an ecosystem?

deforestation; building homes; increasing farmland; pollution

13. **Deforestation:**

Explain what is happening?

Trees being cut down

How does it add to Global Warming?

Trees take in CO₂, if there are fewer trees the CO₂ levels will increase.

4 State Labs

1. Diffusion Through a Membrane

- Selective Permeability: Small particles will pass through the membrane and large particles will NOT pass through. The substance that will pass through is glucose, the substance that will NOT pass through is starch.
- Benedict's solution tests for glucose. (A positive test turns yellow-red when heated.)
- Iodine tests for starch. (A positive test turns blue/black.)
- The diffusion of water is called osmosis.
- Explain what happens to a cell when salt water is added: shrinks
- When the salt water is added, the cell diffuses water to the environment.
- Explain what happens to a cell when distilled water is added: swells

2. Biodiversity

- Organisms may be related if they have **structural** and **molecular** similarities.
- Genetic variation is important for a species to be successful and survive.
- What type of reproduction increases genetic variation?
Sexual
- Why is Biodiversity important?

3. Making Connections

- Pulse rate increases when under physical stress.
- Increase in activity leads to muscle fatigue, which is due to a build up of lactic acid.

4. Darwin's Finches Adaptive Radiation

- Adaptations give some organisms an advantage to survive.
- The environment "naturally selects" which organisms are best "fitted" to survive and reproduce.
- The organisms that survive and reproduce pass favorable genes onto the next generation.
or traits
- What are some examples of what organisms compete for?