

EOCT REVIEW

THE NATURE OF SCIENCE

- Identify terms employed in scientific research.
control group constant procedure
controlled experiment analysis chart
data hypothesis graph
dependent/responding variable independent/manipulated variable
- Identify the metric units used for: Mass, Volume, Length, Density
- Identify the following types of graphs: Line, Bar, Pie. Explain when each would be used.
- Identify what each prefix stands for: kilo-, hecto-, deka-, deci-, centi-, milli-
- Convert: 103m to cm, 1236g to kg, 5L to mL, 10hm to cm.
- Define biology and explain why the study of biology is so important.
- List and explain the characteristics of all living things.

ECOLOGY

- Define:
habitat biosphere population autotrophs
carrying capacity ecosystem niche heterotrophs
limiting factors community
- Distinguish between density independent and density dependent factors. Provide at least 4 examples of each.
- Differentiate different types of symbiotic relationships and provide examples of each. (HINT: there are three main types)
- Distinguish “J” and “S” shaped population growth curves. Explain what each represents and how they differ from one another.
- Differentiate between abiotic and biotic factors and give at least 2 examples of each.
- Compare:
primary and secondary succession (give an example of when each might occur, as well)
pioneer communities and a climax community

BIOCHEMISTRY

- Draw and label the parts of an atom. Include information about the **location** of protons, neutrons, electrons & **charges**.
- What is the difference between ionic and covalent bonds? Give an example of each.
- Define and identify the parts of a solution with an example like sugar water.
- Identify the main **elements** that make up living cells.
- Fill out the following chart to describe the four basic types of organic compounds and their functions in the cell.

Compound	Elements	Monomer/Basic Unit	Function(s)	Examples
Carbohydrates				
Lipids				
Proteins				
Nucleic Acids				

- Compare and contrast dehydration synthesis (condensation) and hydrolysis.
- Draw and label a pH scale. Place the following items on the scale: neutral, strong acids, strong bases, weak acids, weak bases
- Describe the role of enzymes.

9. Identify how various factors (pH, temperature, etc.) affect the rate of enzyme reactions.

10. Describe why water is important to living systems (at least 2 reasons)?

CELL PARTS AND TRANSPORT

1. Distinguish between

- a prokaryote and a eukaryote.
- a unicellular organism and a multicellular organism

2. State the parts of the Cell theory.

3. Be able to label the organelles of a plant **and** animal cell!

4. Fill in the chart and be able to identify the organelles on a plant or animal cell diagram:

CELL ORGANELLE	FUNCTIONS	FOUND IN Plant/Animal/Both Cells
CELL WALL		
CENTRIOLES		
CHLOROPLASTS		
CILIA		
CYTOPLASM		
CYTOSKELETON		
ENDOPLASMIC RETICULUM		
FLAGELLA		
GOLGI BODIES		
LYSOSOMES		
MITOCHONDRIA		
NUCLEOLUS		
NUCLEUS		
PLASMA MEMBRANE (Cell membrane)		
RIBOSOMES		
VACUOLES		

5. Define each of the following terms:

<i>Terms</i>	<i>Definition</i>
<i>Diffusion</i>	
<i>Osmosis</i>	
<i>Active Transport</i>	
<i>Endocytosis</i>	
<i>Exocytosis</i>	

<i>Isotonic</i>	
<i>Hypotonic</i>	
<i>Hypertonic</i>	

- Distinguish between active and passive transport. List 2 examples of each type.
- Identify factors that affect the rate of cellular transport.
- The cell contains 70% water, 5% salt and 25% other materials. The solution it is in contains 70% water, 5% salt, and 25% other materials. Identify the type of solution the cell is in. Draw a picture that best represents the above situation; include arrows to show the direction water will flow. What will happen to a cell in this type of solution?
- The cell contains 78% water, 12% salt and 10% other materials. The solution it is in contains 95% water, 3% salt, and 2% other materials. Identify the type of solution the cell is in. Draw a picture that best represents the above situation; include arrows to show the direction water will flow. What will happen to a cell in this type of solution?
- The cell contains 88% water, 2% salt and 10% other materials. The solution it is in contains 82% water, 16% salt, and 2% other materials. Identify the type of solution the cell is in. Draw a picture that best represents the above situation; include arrows to show the direction water will flow. What will happen to a cell in this type of solution?

CELL ENERGY

- Identify the balanced equation for photosynthesis.
- Complete the chart comparing the two types of photosynthesis reactions:

	Light Dependent	Light Independent (Calvin Cycle)
Location where it occurs in the chloroplast		
Reactants used		
Products produced		

- State the equation for aerobic respiration (cellular respiration).
- Describe the 2 types of anaerobic respiration. When does anaerobic occur? What types of cells?
- Distinguish between aerobic and anaerobic respiration by completing the chart.

	Glycolysis	Fermentation	Kreb's Cycle	Electron Transport
Reactants used				
Products produced				
Amount of ATP produced				
Aerobic or Anaerobic				
Where the process occurs				

- Create a Venn diagram comparing and contrasting photosynthesis and cell respiration (each process should have unique features listed as well as commonalities between the two processes).

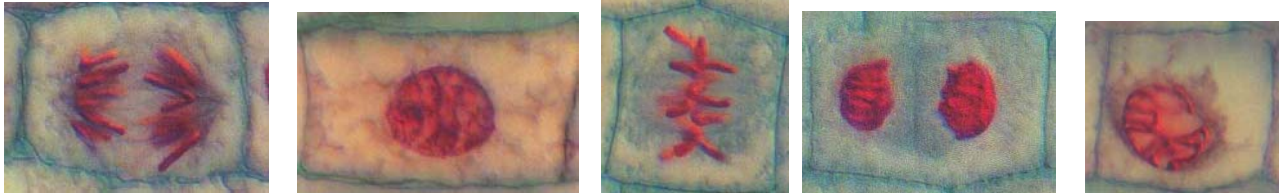
CELL CYCLE

- Draw a diagram of the stages of the cell life cycle. Describe the events that occur in each step.
- Draw a label a chromosome, include sister chromatids and a centromere. What is the relationship between DNA, chromosomes and chromatin?
- Explain the difference in chromosome numbers in somatic (body) cells and reproductive cells (gametes) in humans.
- Why must gametes be haploid?
- Complete the chart below:

Type	# of divisions of nucleus	Parent cell type (haploid or diploid)	Daughter cell type (haploid or diploid)	# of daughter cells produced	Occurs in which part of the body	Similarity of parent to daughter cells

Mitosis						
Meiosis						

6. Identify these stages of Mitosis and number chronologically.



DNA AND GENES

1. Describe at least 3 main differences between DNA and RNA, including the full names of the molecules.

2. Fill in the chart by placing an X or check in the appropriate boxes:

TRAIT	DNA	mRNA	tRNA	rRNA
Contains ribose				
Contains deoxyribose				
Double-stranded				
Single-stranded				
Involved in translation				
Involved in transcription				
Contains uracil				
Contains thymine				
Can be found in the nucleus				
Made of nucleotides				

3. Summarize the processes of DNA replication, transcription, and translation.

4. Explain the effect of mutagens. Explain why some changes in DNA structure are inherited and some are not.

5. Summarize the protein synthesis process, starting with the DNA. Use your codon chart.

DNA (sense)	TAC	AAA	CCA	TTG	CGA	AAT	AGA	TGA	ATT
mRNA									
tRNA									
Amino acid									

MENDEL AND PATTERNS OF HEREDITY AND HUMAN GENETICS

1. Define important genetic terms

- | | |
|-----------|--------------|
| Dominant | Phenotype |
| Recessive | Homozygous |
| Alleles | Heterozygous |
| Genotype | Heredity |

2. Explain the basic Mendelian genetic principles of:

- Principle of Dominance
- Principle of Segregation
- Principle of Independent Assortment

3. Complete a Punnett Square and summarize the **phenotypic** and **genotypic** ratios of the following:

- Monohybrid – Cross two carriers for albinism (Aa, Aa)
- Codominance - In Japanese Four O’Clock flowers, color is governed by incompletely dominant gene, red (R), and white, (r). Cross two plants with pink flowers.
- Sex-linked traits – Cross a female carrier for colorblindness and a male with normal vision. ($X^C X^c$, $X^C Y$)
- Incomplete dominance – White and red
- Codominance in cattle. Cross two roan cows. (RW x RW)

4. Distinguish between autosomes and sex chromosomes.