**Name: _____ Period: _____ Date: _____**

# Biology EOCT Study Guide

The Biology End of Course Test is a state mandated test which covers ALL content taught in the semester of Biology. **This test counts 20% of the students semester average.** This student version study guide is a condensed form of the Georgia Dept. of Education study guide found online at http://www.doe.k12.ga.us/curriculum/testing/eoct_guides.asp. Resources to help you study include your **text book, semester notes, labs, assignments and online resources found at Ms. Dorsey's teacher page**. Content is broken up into 7 domains.
The Biology EOCT is an all multiple choice test. Testing block is 3 hours. The test will be taken **May 15th.**
**Complete this study guide to review all standards taught this school year. If you need any assistance please ask.**

The chart below lists the seven content domains for the ***Biology*** **EOCT**.

| CONTENT DOMAINS | |
|---|---|
| I. | Scientific Processes and Nature of Biology |
| II. | Cellular Basis of Life |
| III. | Chemical Basis of Life |
| IV. | Genetics and Patterns of Change |
| V. | Viruses, Monerans, Protists, and Fungi |
| VI. | Plants and Animals |
| VII. | Ecology and the Environment |

## Domain I – Scientific Processes, Classification and Nature of Biology

Chapters – 1, 17

**I.I. Vocabulary**: In your own words, write the meaning of the following terms:

a) Hypothesis
b) Controlled Experiment
c) Independent Variable
d) Dependant Variable
e) Control
f) Qualitative Data
g) Quantitative Data
h) Taxonomy
i) Systema Naturae/Linnaeus
j) Inference
k) Conclusion
l) Binomial nomenclature

**I.II. Classification** - Linnaeus' Systema Naturae

a) List the Linnaeus' hierarchy of classification from broadest to most specific:

b) Give the scientific name of one organism (notes):

c) List the 6 Kingdoms of classified organisms:

**I.III Metric Measurement** – scientific system of measurement based on factors of 10; conversions by factor of 10.

## Metric Measurement

Each type of measurement has a base unit.

| Quantity | Base Unit |
|---|---|
| length/distance | meter |
| mass | gram |
| time | second |
| temperature | degrees Celsius |
| volume | liter |

Common prefixes used in measurements:

| Prefix | Symbol | Multiple of base unit |
|---|---|---|
| kilo- | k | 1000 |
| hecto- | h | 100 |
| deka- | da | 10 |
| deci- | d | 0.1 |
| centi- | c | 0.01 |
| milli- | m | 0.001 |

You can convert from one unit to the next by multiplying or dividing by 10.

a) How many meters are in 117 centimeters? _____

b) How many grams are in 0.19 kilograms? _____

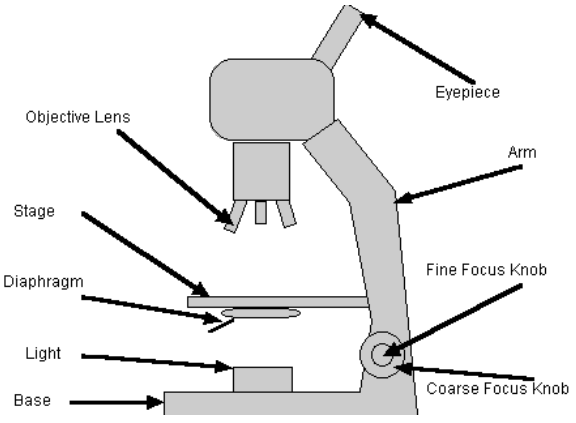
**I.IV Laboratory Skills and Safety**

-Review basic lab safety rules and procedures

a) In the following scenario, identify the **Independent Variable, Dependant Variable, Control, Quantitative Data,** and **Qualitative Data**. **Write a conclusion** based on the data. **Experiment** – You wish to know whether human steroid hormones affect the growth of plants. You take two of the same plant species, plant A and plant B and place them in identical conditions. Plant B receives 10ml of human steroid hormone a day while Plant A receives none. After 10 weeks, you measure the growth and find Plant A to have increased in height by 5.4 cm. Plant B increased in height by 6.3 cm. Plant A has bright green leaves. Plant B has dull yellow leaves with brown spots.

b) Looking at the picture of the microscope, describe the function of the following parts-

a) diaphragm b) objective lens c) eyepiece d) coarse adjustment knob




**I.V. Nature of Biology** – list what each division of Biology studies

a) Botany b) Taxonomy c) Ecology

d) Microbiology e) Genetics f) Zoology

**Content Domain II – Cells** – Structure, Function/Homeostasis
Chapters 3, 4, 5

**II.I Vocabulary -** your own words, write the meaning of the following terms

a) organelle
b) homeostasis
c) hypertonic solution
d) hypotonic solution
e) isotonic solution
f) diffusion
g) cell wall
h) fluid mosaic model
i) diffusion
j) osmosis
k) facilitated diffusion
l) active transport
m) endocytosis
n) exocytosis
o) mitosis

a) List the 3 parts of the Cell Theory -

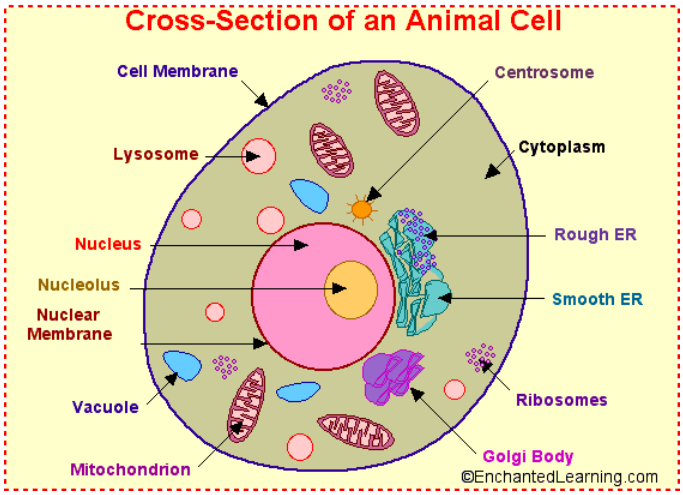
b) List the 8 characteristics of all living organisms –

c) What are the differences between prokaryotic cells and eukaryotic cells?

d) What are differences between plant cells and animal cells?

e) What happens when an animal cell is placed in a hypotonic solution? A plant cell?

g) List the function of the following parts of a cell: 1) Nucleus 2) Ribosomes
3) Cell membrane 4) Mitochondria 5) Golgi Body 6) Lysosome 7) ER




h) If this cell were a plant cell, what other structures would be present? What are the functions of these parts?
i) Discuss how passive transport (osmosis, diffusion, facilitated diffusion) and active transport (requiring ATP) help a cell maintain homeostasis.

j) List the chemical equation for photosynthesis

k) List the chemical equation for cellular respiration

j) Compare and contrast photosynthesis and cellular respiration

k) List the stages of Mitosis.

l) What is the outcome of Mitosis?

m) List the stages of Meiosis

n) What is the outcome of Meiosis?

o) Compare and contrast mitosis and meiosis.

## Content Domain III Biochemistry – Chemical basis of life

Chapter 2

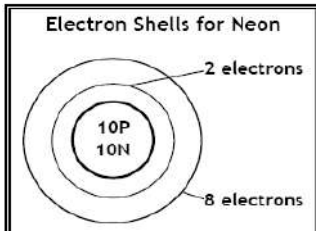
III.I Vocabulary – Write the meaning of the following terms in your own words.

a) atom
b) element
c) matter
d) organic compound
e) inorganic compound
f) acid
g) base
h) pH scale
i) solute
j) solvent
k) isotope
l) ion

**ELECTRON CONFIGURATION**

Maximum number of electrons for each electron shell:

| shell # | # of electrons |
|---|---|
| 1 | 2 |
| 2 | 8 |
| 3 | 18 |
| 4 | 32 |




**III.II Content review questions**

a) Neon is atom #10. How many electrons, protons and neutrons does Neon have?
b) Lemon juice has a pH value of 4. Is this acidic, neutral or basic?
c) Pure water is neutral. Its pH would be _____.
d) Ammonia has a pH of 13. Is this acidic, neutral or basic?

**ORGANIC COMPOUNDS**

- Carbohydrates
- Lipids
- Proteins
- Nucleic Acids

e) Which of these 4 compounds is used for energy storage?
f) Which is used for structure and enzymatic reactions?
g) Which is used for a quick energy source?
h) Which holds genetic information?

**Content Domain IV Genetics and Evolution**

Chapter 6-12

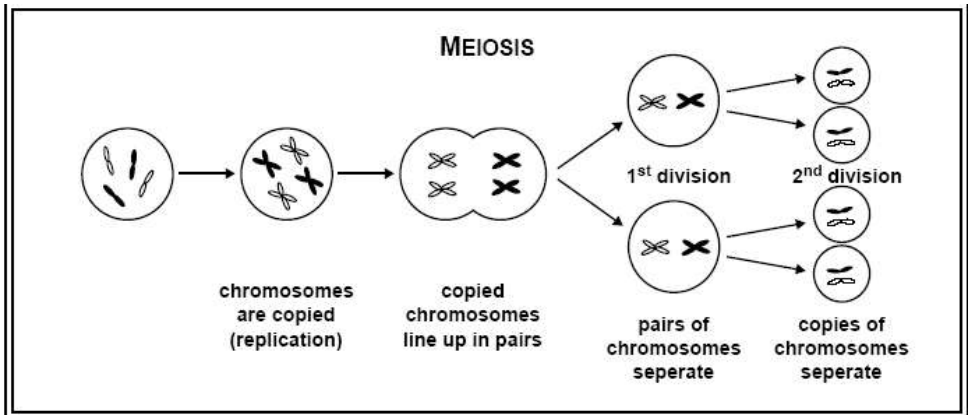
**IV.I Vocabulary** – write the meanings to the following terms in your own words.

a) homologous chromosome
b) meiosis
c) gametes
d) haploid
e) diploid
f) gene
g) allele
h) zygote
i) genotype
j) phenotype
k) Dominant
l) recessive
m) homozygous
n) heterozygous
o) chromosomal mutation
p) genetic engineering
l) sex linked trait
m) evolution
n) fitness
o) adaptation
p) genetic variation

**IV.II Content Review Questions**

a) Albinism is a recessive condition. If two normal parents, genotypes Aa and Aa have a child, what is the likelihood he or she will have the recessive phenotype? Set up a punnett square to show.

b) What are Gregor Mendel's Three Laws relating to genetics –




c) Looking above, what is the overall outcome of Meiosis? Are the cells produced diploid or haploid?

d) Colorblindness is a recessive sex linked trait (X chromosome). Set up a punnett square to show the likelihood (percentage) of a colorblind female (X**c** X**c**) and a normal male (X**C** Y) having a colorblind daughter. Colorblind son?

e) In the following example, pick out which adaptation is most fit for the new environment. What will occur to each allele frequency in the population? What will the future populations look like? What did Darwin call this?

In a population of mice, there are two phenotypes, brown (BB, Bb) and grey (bb). Their habitat once was a snowy tundra, but now the snow is melting to brown dirt.

f) List the three parts to Darwin's Theory of Natural Selection-

g) Give an example of vestigial structures and explain how vestigial structures are significant to evolution.

h) How are genes and proteins similar to homologous structures when determining evolutionary relationships among species?

i) Describe three types of barriers that can cause populations to become reproductively isolated from each other.
j) What are some causes of mass extinctions?

k) What are two ways that cyanobacteria have changed the physical or chemical composition of Earth?

l) What is the difference between relative dating and absolute dating?

m) Considering that millions of species have lived on Earth, why are there relatively few fossils?

n) Draw and label a molecule of DNA – which bases are found in DNA? What is the function?

o) Draw and label a molecule of RNA – which bases are found in RNA? What is the function?

p) **DNA REPLICATION**: If the DNA sequence is AGTCCT, what would be the newly replicated sequence? What enzyme is responsible for this process? Where does this occur?

q) **PROTEIN SYNTHESIS DNA → RNA → PROTEIN** – **TRANSCRIPTION**: If the DNA sequence is AGTCCT, what would be the mRNA sequence transcribed? What enzyme is responsible for this process? Where does this occur?

r) **PROTEIN SYNTHESIS DNA→ RNA→PROTEIN – TRANSLATION**: Take the mRNA sequence from above and write the tRNA anticodon sequence. Which sequence is read to determine the amino acid sequence?

s) What may happen if there is a mutation in the DNA code?

t) Identify three ways mutations can occur.

u) Explain how mutagens can cause genetic mutations in spite of your body's DNA repair enzymes.

v) Explain why a person that has skin cancer continues to have the growths reappear even after having them removed.

w) Explain how bacteria can produce a human protein.

x) Identify four ways in which scientists can manipulate DNA.

**Content Domain V - Viruses, Bacteria, Protists and Fungi**

Chapter 18-19

**V.I Vocabulary** – Define the following terms in your own words.

a) Capsid
b) Bacillus
c) Coccus
d) strepto
e) staphalo
f) spirillus
g) binary fission
h) cilia
i) pseudopods
j) mycelium

**V. II Content Review Questions**

a) Draw the structure of a virus

b) Why are viruses not classified as living organisms?

c) Due to their unique ability to break down an enormous array of substances, prokaryotes play critical roles in ecosystems. Summarize two of these roles.

d) Explain the differences between the two ways viruses infect their host cells.

**Fill out the table for each Kingdom**

| Kingdom | Cell Type | Multi/Uni Celled | How obtain energy? |
|---|---|---|---|
| Archaebacteria/ Eubacteria | | | |
| Protista | | | |
| Fungi | | | |

e) What are the three types of Protist?

**Animal Like Protist Divisions**

| Phylum name | Means of Locomotion |
|---|---|
| Ciliophora (ciliophorans) | use cilia (hair-like projections) |
| Sarcodina (sarcodinians) | use pseudopods (foot-like cytoplasmic projections) |
| Sporozoa (sporozoans) | do not move; parasitic |
| Zooflagellata (zooflagellates) | use flagella (whip-like projections) |

f) What trait is used to classify Animal like protists?

**Plant Like Protist Divisions**

| Phylum name | Pigments |
|---|---|
| Chlorophyta (green algae) | chlorophylls *a* and *b*, carotenoids |
| Chrysophyta (golden-brown algae) | chlorophylls *a* and *c*, carotenes, xanthophylls, fucoxanthins |
| Euglenophyta (euglenoids) | chlorophylls *a* and *b* |
| Phaeophyta (brown algae) | chlorophyll *a* and *c*, fucoxanthin |
| Dinoflagellata (dinoflagellates) | chlorophylls *a* and *c*, xanthophylls |
| Rhodophyta (red algae) | chlorophyll *a* and *d*, carotenes, phycobilins |

g) What is the basic function of the pigments in the plant like protist division?

h) List two positive effects of protists; list two negative effects of protists.

**Fungi Phylum chart**

| Phylum name | Reproduction | | Examples |
|---|---|---|---|
| | Asexual Spores | Sexual | |
| Ascomycota (sac fungi) | conidia | ascospores produced in ascus (sac-like structure) | cup fungi, yeasts, mildew |
| Basidiomycota (club fungi) | conidia | basidiospores produced in basidium (club-like structure) | mushrooms, puffballs, shelf fungi, rusts |
| Deuteromycota (imperfect fungi) | conidia | no sexual phase known | *Penicillium*, ringworm, athlete's foot fungus |
| Zygomycetes (common molds) | sporangia | conjugation (the fusion of two nuclei from different mating strains) | *Rhizopus* |

i) Using the chart of Fungi Phyla, what trait is used to classify fungi?

j) How is the decomposing activity of fungi both beneficial and harmful?

k) Draw a mushroom (kingdom fungi) and label the following –fruiting body, mycelium, gills, basidia

## Content Domain VI – Plants and Animals

Chapters 20-27

**VI. I Vocabulary**

a) Vascular System
b) Xylem
c) Phloem
d) Alternation of Generation
e) seed
f) angiosperm
g) gymnosperm
h) Monocot
i) Dicot
j) cotyledons
k) pollination
l) germination
m) vertebrate
n) invertebrate
o) coelom
p) bilateral symmetry
q) radial symmetry

**VI.II Content Review Questions**

a) What are the basic characteristics of a plant?

b) What is the difference between an angiosperm and a gymnosperm?

c) Draw and label the reproduction structures of a flower – stamen, pistil, ovary, carpal, pollen

d) What are the basic characteristics of an animal (Kingdom animalia)?

**Invertebrates**

| **Division** | **Reproduction** | **Diet** | **Coelomy/n** | **Symmetry** | **Respiration** | **Organs? Defining traits?** |
|---|---|---|---|---|---|---|
| **Porifera** Sponges | | | | | | |
| **Cnidaria** Jellyfish, Sea Anemones | | | | | | |
| **Platyhelminthes** Flatworms | | | | | | |
| **Nematoda** Round worms | | | | | | |
| **Mollusks** Snails, clams, nautilus | | | | | | |
| **Anthropods** Insects, crustaceans | | | | | | |

**Vertebrates/Chordates**

| **Division** | **Reproduction** | **Diet** | **Warm/Cold Blooded** | **Respiration** | **Organs/ Defining traits** |
|---|---|---|---|---|---|
| **Fish** | | | | | |
| **Amphibians** | | | | | |
| **Reptiles** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Birds** | | | | | |
| **Mammals** | | | | | |

## Content Domain VII-Ecology and The Environment

Chapters 13-16

**VII.I. Vocabulary**: In your own words, write the meaning of the following terms:

a.
b. Ecology
c. Biotic factor
d. Abiotic factor
e. Populations
f. Niche
g. Community
h. Habitat
i. Producers
j. Consumers
k. Food chain
l. Trophic level
m. Food web
n. Succession
o. Carrying capacity
p. Biomes
q. Pollution
r. Air pollution
s. Pollutant
t. Water pollution
u. Limiting factors
v. Exponential growth
w. Logistic growth
x. Decomposers
y. Carnivores
z. Herbivores
aa. Omnivores
bb. Water cycle
cc. Nitrogen cycle
dd. Phosphorous cycle
ee. Heterotroph
ff. Climax community
gg. Greenhouse effect
hh. Global warming
ii. Ozone depletion
jj. Acid rain
kk. Biosphere
ll. Environment
mm. Ecosystem
nn. Mutualism
oo. Commensalism
pp. Parasitism
qq. Nonrenewable resources
rr. Renewable resources
ss. Smog
tt. Biodiversity
uu. Geotropisms
vv. Thigmotropisms
ww. Phototropisms
xx. Innate behavior
yy. Learned behavior
zz. Camouflage

**VII.II Content Review Questions**

a. What are the components of an ecosystem?

b. List and describe the 6 major biomes of the world.

c. Draw and label a food chain and food web that show the flow of energy and matter within a biome of your choosing. (All tropic levels must be accurately labeled)

d. Describe what happens to the food chain if an organism is removed.

e. Explain the need for the cycling of major nutrients (C, N, O, H, P)

f. Explain primary and secondary succession and the benefits of each.

g. State the possible causes and solutions to the following environmental threats: Greenhouse effect, global warming, ozone depletion, and acid rain

h. What adaptations have plants and animals acquired to increase their chances of survival? Specifically, what mechanisms help them to survive in stressful situations?

i. What is the difference between an autotroph and a heterotroph? Give an example of each.

j. Compare producers and consumers and give an example of each.

k. Give an example of each of the following: scavenger, herbivore, carnivore, omnivore, and decomposer. Know the definitions as well!

l. List and explain the three different Ecological Pyramids. Be sure to include the 10% law in your explanation. (you may use drawings if you like)

m. How are the flow of matter and the flow of energy through ecosystems different?

n. Define the following terms associated with the water cycle:
Evaporation
Transpiration
Condensation
Precipitation

o. What is a limiting factor? Give 3 examples.

p. Name the different levels of organization within the biosphere from smallest to largest. (See chart in notes)

q. Define the terms abiotic and biotic. Give an example of each factor.

r. Make a chart that compares mutualism, commensalism, and parasitism. In your chart you should include definitions of each as well as an example of each.

s. List and explain the 3 Factors that affect population size. Include definitions for immigration and emigration.

t. Compare Exponential and Logistic Growth. Draw what a graph for each would look like.