

Biology 300 Final Exam Review Packet

UNIT 9: Evolution (Chapter 12)

Essential Question 1: What is the role of natural selection in creating diversity in organisms?

Essential Question 2: What is the evidence that supports the modern theory of evolution?

Essential Question 3: How do organisms change over time?

CONTENT KNOWLEDGE OBJECTIVES

Initial Understanding :

Explore Darwin's observations and parallel his road to the discovery that life forms change over time.

Developing an Interpretation:

Uncover the lines of evidence that led Darwin and others to suggest evolutionary theory.

Making Connections:

Demonstrate that the process of natural selection has provided the tremendous diversity of life on earth.

Apply their knowledge of genetics to explain how alterations have taken place in living organisms to create diversity.

Taking a Critical Stance:

Theorize about how the first living organisms were formed and how the evolution of the first autotrophs affected the future of life on earth.

VOCABULARY

adaptation

analogous

comparative anatomy

comparative embryology

competition

evolution

extinct

fossil

homologous

mutation

natural selection

population

random

species

survival of the fittest

variation

vestigial

UNIT 10: Classification (Chapter 14)

Essential Question 1: How and why are organisms grouped?

Essential Question 2: Why have classification systems changed over time?

CONTENT KNOWLEDGE OBJECTIVES

Initial Understanding:

Understand the use of binomial nomenclature in organizing living things.

Developing an Interpretation:

Explain how and why the classification system has changed and will continue to change.

Describe how advancements in technology have improved and altered the classification of organism.

Making Connections:

Relate the necessity for classification in students' lives to the necessity of classifying organisms.

Taking a Critical Stance:

Create a phylogenetic key based on the evidence used for classification in biology.

Given several characteristics of a particular organism appropriately **place** it in the proper taxa.

VOCABULARY

binomial nomenclature

class

common name

domain

family

genus

kingdom

order

phylogeny

phylum

scientific name

taxa

taxonomy

UNIT 11: Reproduction (Chapter 18)

Essential Question 1: What are the different methods of passing heritable material?

Essential Question 2: What are the structures of the human reproductive system and their functions?

CONTENT KNOWLEDGE OBJECTIVES

Initial Understanding:

Describe the various patterns of reproduction that are shared by a wide variety of organisms demonstrating the theme of unity within diversity.

Describe the structures and associated functions of the human reproductive system.

Describe the various steps of the human menstrual cycle.

Developing an Interpretation:

Analyze the adaptations that exist allowing for external and internal fertilization.

Making Connections:

Understand the functioning of their own reproductive system and its similarities, in structure and function, to those of other forms of life.

Taking a Critical Stance:

Compare and contrast the various methods of reproduction and their efficiency and appropriateness for various species.

Explore the advantages expressed by those species that have evolved numerous methods for reproduction and **defend** the superiority of one method over one another.

VOCABULARY

alternation of generations

anther

binary fission

budding

bulbourethral gland

conjugation

double fertilization

endosperm

estrus

filament

flower

follicle

fragmentation

gametophyte

hermaphroditic

hormone

menstrual cycle

menstruation

ovary

oviduct

ovulation

ovule

penis

petal

pistil

pollen

pollination

prostate gland

regeneration

scrotum

semen

seminiferous tubules

sepal

sporophyte

stamen

stigma

style

testes

urethra

uterus

vagina

vas deferens

vegetative reproduction

UNIT 12: Nutrition and Digestion (Chapter 20)

Essential Question 1: How and why do organisms obtain nutrients?

Essential Question 2: What are the structures of the human digestive system and their functions?

CONTENT KNOWLEDGE OBJECTIVES

Initial Understanding:

Describe the nutritional needs of human beings.

Describe the structures and associated functions of the human digestive system.

Developing an Interpretation:

Demonstrate the necessity for digestion and compare the variety of designs employed by organisms to accomplish this function **defending** the suitability of these designs.

Making Connections:

Distinguish between and recognize the nutritional requirements of autotrophs and heterotrophs and **compare** the many ways organisms meet their nutritional needs.

Taking a Critical Stance:

Demonstrate knowledge of a healthy diet and how human beings can meet their nutritional needs.

VOCABULARY

anus

bile

chemical digestion

chyme

colon

crop

digestion

epiglottis

esophagus

extracellular digestion

gallbladder

gizzard

HCl

intracellular digestion

large intestine

mouth

nutrient

pancreas

pepsin

peristalsis

pharynx

physical digestion

salivary gland

small intestine

stomach

teeth

tongue

villi

UNIT 13: Transport (Chapter 21)

Essential Question 1: How and why do necessary life materials move within an organism?

Essential Question 2: What are the structures of the human circulatory system and their functions?

Essential Question 3: How does the circulatory system of animals interact with other body systems?

CONTENT KNOWLEDGE OBJECTIVES

Initial Understanding:

Understand and explain the necessity for a means of transport in all organisms.

Explore the transport system in a vascular plant.

Developing an Interpretation:

Explain the existence of a system of transport in organisms whose cells are distant from the environment.

Making Connections:

Compare and contrast the variety of systems that provide transport in organism.

Taking a Critical Stance:

Appreciate the common characteristics as well as the improvements in complexity and efficiency of transport systems of organisms.

Students will be able to **demonstrate** an appreciation of the importance of maintaining cardiovascular health due to its vital role in connecting the other systems.

VOCABULARY

antibody

antigen

aorta

artery

atrium

capillary

closed circulatory system

guard cell

lymph node

open circulatory system

phloem

platelet

red blood cell

root hair

sieve tube

valve

vein

ventricle

vessel

white blood cell

xylem

UNIT 14: Gas exchange and Excretion (Chapter 22)

Essential Question 1: How and why is gas exchange important in maintaining homeostasis?

Essential Question 2: How and why is excretion of metabolic waste important in maintaining homeostasis?

Essential Question 3: What are the structures of the human gas exchange system and their functions?

Essential Question 4: What are the structures of the human excretory system and their functions?

CONTENT KNOWLEDGE OBJECTIVES

Initial Understanding:

Discuss the role of gas exchange in plants and its necessity in maintaining homeostasis.

Discuss the role of the respiratory system in animals and its necessity in maintaining homeostasis.

Explore the necessity for having adaptations for maintaining osmotic balance in organisms.

Developing an Interpretation:

Describe the process of maintaining osmotic balance and excretion in simple freshwater organisms.

Describe the function of excretion and the maintenance of osmotic equilibrium in those animals possessing a circulatory system.

Making Connections:

Understand the function of the human excretory system and its necessity for maintaining homeostasis.

Taking a Critical Stance:

Compare and contrast the functioning of the respiratory systems of the animal kingdom including annelids, bony fish, mammals and humans.

VOCABULARY

alveolus

Bowman's capsule (glomerular capsule)

bronchus

diaphragm

excretion

gill

glomerulus

kidney

lung

nephron

respiration

trachea

ureter

urethra

urinary bladder

urine

UNIT 15: Nervous Control (Chapter 25)

Essential Question 1: What is the structure and function of a neuron?

Essential Question 2: What is the role of the nervous system in maintaining homeostasis?

Essential Question 3: What is the significance of the steps in a reflex arc?

CONTENT KNOWLEDGE OBJECTIVES

Initial Understanding:

Describe the structure of a neuron and demonstrate its relationship to its function.

Demonstrate the pathway of an impulse through the nervous system and describe the types of neurons that transport these impulses.

Developing an Interpretation:

Diagram the transmission of an impulse and explain how this transmission produces an all-or-none response.

Making Connections:

Explain the complex workings of the human nervous system and its interaction with the other systems.

Explain the interaction that drugs have with the nervous system.

Taking a Critical Stance:

Demonstrate an understanding of the reflex arc and describe its evolutionary rationale.

Compare and contrast the nervous systems of animals with an appreciation of the increased complexity derived through evolution.

VOCABULARY

action potential

axon

central nervous system

cerebellum

cerebrum

dendrite

effector

interneuron

involuntary

medulla oblongata

motor neuron

myelin sheath

nerve

neuron

neurotransmitter

peripheral nervous system

receptor

reflex

resting potential

sensory neurons

stimuli

synapse

terminal axon

voluntary

UNIT 16: Movement (Chapter 26)

Essential Question 1: How and why do organisms move?

Essential Question 2: What are the components of a skeletal system and their functions?

CONTENT KNOWLEDGE OBJECTIVES

Initial Understanding:

Discuss the ways in which bones meet to form different types of joints, allowing for movement.

Demonstrate locomotion methods in organisms without skeletons.

Developing an Interpretation:

Compare and contrast the endoskeleton and exoskeleton, **identifying** the advantages and disadvantages of each.

Making Connections:

Make connections between the skeletal and muscular systems in the human and their interaction to create locomotion.

Taking a Critical Stance:

Distinguish among the three types of vertebrate muscle and their specific roles.

VOCABULARY

ball and socket joint

cardiac muscle

cartilage

extensor

fixed joint

flexor

gliding joint

hinge joint

ligament

pivot joint

smooth muscle

striated muscle

tendon

UNIT 17: Ecosystems (Chapters 27 & 28)

Essential Question 1: How are energy and nutrients made available to all members of a community?

Essential Question 2: What are the various relationships between the trophic levels?

CONTENT KNOWLEDGE OBJECTIVES

Initial Understanding:

Trace the pathway of energy through an ecosystem using an energy pyramid and stressing the necessity of a constant source of energy.

Examine the recycling of materials in an ecosystem and **describe** the carbon, nitrogen and water cycles.

Discuss the symbiotic relationships that exist between organisms in an ecosystem giving specific examples of commensalism, parasitism and mutualism.

Developing an Interpretation:

Demonstrate an understanding that ecosystems vary in their interaction of biotic and abiotic factors.

Making Connections:

Examine the various biomes of the planet and **demonstrate** the abiotic and biotic factors that are elements of these biomes.

Taking a Critical Stance:

Given a particular example of an ecosystem **predict** the influence of any change in the biotic and/or abiotic factors on the stability of the system.

VOCABULARY

abiotic factor

algal bloom

biomass

biotic factor

carnivore

commensalism

consumer

decomposer

ecosystem

first-order consumer

food web

mutualism

herbivore

omnivore

parasitism

producer

trophic level

scavenger

symbiosis