Name:_____Date:_____Block:____

The Big Picture: A Review of Biology for the EOCT

INTRODUCTION TO BIOLOGY / SCIENTIFIC METHOD

1. Define biology

2. What is the difference between a unicellular & a multicellular organism?

3. List the characteristics of life

4. What is homeostasis and give an example?

5. List the 6 steps of the scientific method:

6. Independent variable:

   Dependent variable:

CHEMISTRY OF LIFE

7. What is an organic compound?

8. Fill in the table:

Macromolecule	**What is it made of? What are its building blocks?**	**What is it used for?**	**Examples of how it is used in body**
		enzymes- speed up rxns **hormones-** send messages thru body **structural-** hair, nails, skin	Amylase, insulin, hair, nails, every part of your cells!
Carbohydrates	Monosaccharides (glucose & other simple sugars)		
	Fatty acids and glycerol		
Nucleic Acids		Storing genetic information & Protein synthesis	

9. An enzyme is a _____ that speeds up _____ _____ by lowering the amount of _____ needed which makes the reaction happen faster.

10. Water molecule is made up of?

11. What is cohesion?

12. What is adhesion?

13. What do we call the reason that it is hard to change water's temperature?

14. The pH scale ranges from _____.

15. A pH of _____ is netural; _____ is an acid; _____ is a base.

CELLS

16. What are the characteristics of a prokaryote?

17. What are the characteristics of a eukaryote?

18. What are the differences between plant and animal cells?

19. Fill in the organelle table:

Organelle Structure	Organelle Function	Plant, Animal, or Both?
Nucleus		
Nucleolus		
	Smallest organelle, site of protein synthesis	
	Long channels where ribosomes pass while they make proteins	
	Takes proteins from ribosomes, reorganizes & repackages them to leave cell	
	Store digestive enzymes to clean up dead cell parts, bacteria, etc	
Vacuole		
	Controls what goes in & out of cell; maintains homeostasis	
	Makes ATP from food we eat & stores ATP (energy storage molecule); site of cellular respiration	

Chloroplast		
	Outermost boundary of plant cell; gives support & protection; made of cellulose	

20. What is the function and structure of the cell membrane?

21. What are the 2 ways things are transported across the cell membrane? Give 2 examples of both.

22. What type of cellular transport requires a cell to use energy?

23. What is the term that describes the movement of water through a cell?

24. A hypotonic solution causes a cell to _____? Why?

25. A hypertonic solution causes a cell to _____? Why?

26. An isotonic solution causes a cell to _____? Why?

27. What is the process by which organisms use energy from sunlight to make their own food (glucose)?

28. What is the process that breaks down glucose in order to make energy for an organism?

29. Write the equations for cellular respiration and photosynthesis

DNA AND GENETICS

30. What are some things DNA and RNA have in common?

31. What are some things that make DNA and RNA different?

32. Transcription uses _____ to make a copy of a segment of _____. It happens in the _____.

33. Translation reads the _____ and builds the protein using the matching _____ _____. It happens where?

34. If one side of the DNA molecule reads ATGCCGT, what would the complementary side read?

35. **Mitosis**. Makes new _____ cells. Starts with cells that are diploid and ends with cells that are _____. The daughter cells are _____ the parent cell.

36. **Meiosis**. Makes _____. Starts with cells that are _____ and ends up with cells that are _____. The daughter cells are _____ the parent cell.

37. What are the benefits of asexual reproduction?

38. What are the benefits of sexual reproduction?

39. What are different versions of a gene for the same trait called?

40. What is the difference between a genotype and phenotype? And give an example of both.

41. The _____ allele masks the _____ allele.

42. Using the letter G, write the genotypes of the following:
    a. Heterozygous:
    b. Homozygous dominant:
    c. Homozygous recessive:

43. The Diagram below shows a cross between 2 individuals
    What are the genotypes of the parents for this punnett square?

BB	Bb
Bb	bb

26. What is the difference between co-dominance and incomplete dominance?

27. What does a pedigree show and what type of diseases is it best used to determine?

CLASSIFICATION AND EVOLUTION

28. The system we use to name organisms is called _____ _____. The first name is the _____ and the second name is the _____.

29. List the levels of classification

30. What level of classification includes the fewest organisms?

31. Fill in the table of the domains:

	PROKARYOTES (no nucleus or membrane bound organelles)		**EUKARYOTES** (have a nucleus and membrane bound organelles)			
Domain	**DOMAIN ARCHAEA**	**DOMAIN BACTERIA**	**DOMAIN EUKARYA**			
Kingdom						
Characteristics	Extreme bacteria	Common bacteria	Mostly unicellular		mostly Multicellular	Multicellular

	Prefer salty, hot, or high pH environment	Prefer normal warm, moist environment	Cell walls made of cellulose in some		Cell walls made of chitin	No cell walls
			Autotrophic or heterotrophic			

32. Viruses are not considered _____ because they do not exhibit the characteristics of life. They do have _____ or _____. What doesn't work on viruses?

33. Who developed the current theory of evolution?

34. Characteristics of Natural Selection:
    a. All organisms produce more offspring than can _____.
    b. All offspring are _____ _____.
    c. Variations in genes allow some offspring to _____ the others.
    d. Those with positive traits _____ to pass their genes on. (survival of the fittest)
    e. Eventually the entire _____ evolves and changes OVER TIME.

35. What happened to the moth populations after the industrial revolution?

36. _____ evolution: many species descend from common ancestor. Example:

37. _____: 2 species evolve in response to each other. Example:

38. _____ evolution: 2 species evolve to have the same trait because they live in similar environments. Example:

39. There are three types of evidence:

40. What is a homologous structure? Give an example.

41. Analogous structures have different _____ but similar _____. Example?

42. What is a vestigial structure? Give examples.

43. What does a cladogram show us?

44. What is a dichotomous key used for?

ECOLOGY

45. What are the levels of ecology from smallest to largest?

46. What is the difference between a food chain and a food web?

47. Trophic levels:
    a. Producers: _____ their food. _____ of food chain.
    b. Primary consumers: _____ that get energy from _____.

c. Secondary consumers: _____ that gets energy from _____.
d. Tertiary consumers: _____ or _____ that gets energy from secondary consumer. _____ the food chain.

48. What is the difference between how decomposers and detritivores get energy? Give examples of each.

49. Energy pyramids show that energy _____ as you go up the food chain. The top _____ in an ecosystem gets the least energy. _____ also decreases as you go up the food chain.
50. Biogeochemical cycles show how nutrients and chemicals must be _____ so new organisms can grow. Examples of cycles:
51. _____ Succession is when life happens in an environment for the first time. Example:
52. _____ Succession is when life happens after a disturbance.

    Example:

53. Most populations show _____ growth when there is plenty of resources.
54. When factors become limited, the population growth levels off and begin to show _____ growth.
55. The population numbers hover around the _____ _____ of that organism, or the number of organisms that can be supported in that area.
56. Fill in the biomes table:

BIOME	CLIMATE	PLANT ADAPTATIONS	ANIMAL ADAPTATIONS
	Warm all year round Gets most precip.	Layered forest Broad, big leaves to capture sunlight in understory; variety of seed adaptations	Arboreal (live in trees); long prehensile tails, gliders; insects, monkeys
	High temperatures Low precipitation	Succulents- store water; spines for protection and decreased transpiration; cacti, aloe	Large ears to dissipate heat; burrowers; nocturnal; insects, reptiles, coyotes, jack rabbits
	High temperatures Moderate precipitation Savanna's get more rainfall than prairies Frequent fires	Tall grasses; a few trees near sources of water	Grazing animals Feed at different levels to avoid competition Burrowing animals
	Moderate temperature Moderate precipitation	Deciduous trees- lose leaves in winter to conserve water Oaks, hickory, maple, sweetgum	Hibernate in winter Dull colors to blend in with tree trunks or dead leaves in fall/winter Deer, raccoons, squirrels, snakes
	Long, cold winters Short cool summers	Evergreen/coniferous trees- wax on needles prevents water loss so they keep leaves all year; thick bark; pyramid shaped tree to slough snow; shallow roots	Broad hooves/feet to walk on snow; thick fur/blubber; moose, elk, wolverines, insects
	Long cold winters Short cool summers	Small plants to prevent water loss, grow close to ground to get maximum sun/warmth; lichens, moss, small flowering plants	Broad hooves/ feet to walk on snow; thick fur/blubber; hibernate; polar bears, caribou/reindeer, seals