

STIAchievement Services

Formative Assessments Pacing Guide for St. Clair County Schools AHSGE Biology Objectives

(Each objective includes 6 test items except Objectives 4 & 9 which share 6 test items. Total Items=90)

Cos Standards/ AHSGE Objectives and Eligible Content (Textbook/Other Resources)	Months to be Taught (Semester I/ Semester II) Accelerated Guide Weeks 1-7	Content Vocabulary (Word Walls)	Test Vocabulary/ Bloom's Level (Word Walls)	Rigor Level I-introduces content/basic theory Rigor Level II-connects to prior knowledge Rigor Level III-focuses on highly developed skills, integrates complex skills Rigor Level IV-demonstrates skills in independent groups (project based); includes use of technology
<p>1. Select appropriate laboratory glassware, balances, time measuring equipment, and optical instruments to conduct an experiment.</p> <ul style="list-style-type: none"> Select appropriate glassware for conducting experiments including a graduated cylinder, a beaker, a flask, a test tube, a microscope slide, a pipette, and a Petri dish. Select appropriate measuring equipment for conducting experiments including a balance and a stopwatch. Select appropriate optical instruments for conducting experiments including a compound microscope, an electron microscope, and a magnifying glass. 	<p>Introduce August/ January</p> <p>Ongoing throughout semester</p> <p>AG Week 1</p>	<p>Petri dish, graduated cylinder, beaker, flask, test tube, microscope slide, pipette, balance, stopwatch, mL, watch glass, agar, hypothesis, compound microscope, electron microscope, triple beam balance, optical instruments, magnifying glass</p>	<p>Conducting an experiment, precisely, best, most accurately, graduated cylinder, electron microscope, spontaneous generation, conducting experiment, single-celled organism, precisely, conducting, volume, mL, broth, hypothesis, spontaneous generation, most, volume, electronic balance, accurately, solid, agar</p> <p>Level 3</p>	<p>Level I</p>
<p>2. Describe cell processes necessary for achieving homeostasis, including active and passive transport, osmosis, diffusion, exocytosis, and endocytosis.</p>	<p>September/ February</p> <p>AG Week 3</p>	<p>Homeostasis, active transport, passive transport, osmosis, diffusion, exocytosis, endocytosis, physiological, transport proteins,</p>	<p>Eliminate, energy is used, more or less, concentrated, impermeable, describes, Arrows (all directions, i.e. →</p>	<p>Level III</p>

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<p>Biology COS Standard 2 continued:</p> <ul style="list-style-type: none"> Recognize and apply the definition of homeostasis. (The ability of an organism/cell to maintain internal balance/stability by adjusting its physiological processes.) Recognize/apply definition of active transport. (Movement of a substance across a biological membrane against its concentration or electrochemical gradient w/help of energy input/specific transport proteins.) Recognize and apply the definition of passive transport. (The diffusion of a substance across a biological membrane.) Recognize and apply the definition of osmosis. (The movement of water across a selectively permeable membrane.) Recognize and apply the definition of diffusion. (The spontaneous tendency of a substance to move down its concentration gradient from a more concentrated to a less concentrated area.) Recognize and apply the definition of exocytosis. (The cellular secretion of macromolecules by the fusion of vesicles with the cell membrane.) Recognize/apply definition of endocytosis.(The cellular uptake of macromolecules/particulate substances by localized regions of cell membrane that surround substance/pinch off to form intracellular vesicle.) 		<p>concentration gradient, selectively permeable, macro-molecules, intracellular vesicle, semi-permeable, spontaneous, secretion vesicles, intracellular, extracellular</p>	<p>Move from areas of low concentration to high concentration, movement of direction, solution is more or less concentrated</p> <p>Level 4</p>	

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<p>3. Identify reactants and products associated with photosynthesis and cellular respiration, and the purposes of these two processes.</p> <ul style="list-style-type: none"> Identify the chemical formula for photosynthesis. Identify the function of photosynthesis. Identify the chemical formula for respiration. Identify the function of respiration. Identify the relationship between photosynthesis and respiration. 	<p>October/ February AG Week 4</p>	<p>Photosynthesis, cellular respiration, chemical formula, products, reactants,</p>	<p>Fluctuation, primary purpose, identify, factor, temperature, light intensity, water availability Level 3</p>	<p>Level III</p>
<p>4. Describe similarities and differences of cell organelles, using diagrams and tables.</p> <ul style="list-style-type: none"> Identify cell structures including cell membrane, cell wall, nucleus, ribosome, smooth endoplasmic reticulum, rough endoplasmic reticulum, Golgi body, vacuole, chloroplast, and mitochondrion. Classify organisms as prokaryotic or eukaryotic. <p>9. Differentiate between the previous five-kingdom and current six-</p>	<p>September/ February AG Weeks 3-4</p>	<p>All cell structures (cell membrane, cell wall, nucleus, ribosome, smooth endoplasmic reticulum, rough endoplasmic reticulum, Golgi body, vacuole, chloroplast, mitochondrion), prokaryotic, eukaryotic</p>	<p>Similarities, differences, synthesizing and packaging protein, study cell diagrams, tables, membrane bound Level 4</p>	<p>Level III</p>

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<p>kingdom classification systems.</p> <ul style="list-style-type: none"> Identify and define similarities and differences between the five-kingdom and six-kingdom classification systems. 	<p>November/ April AG Week 5</p>	<p>Simple/complex, Archaeobacteria, peptidoglycan, unicellular, anaerobic, lipids, classification, fungi, Protista, monera, eubacteria, plantae, animalia,</p>	<p>Simple/complex, genetic information Level 4</p>	<p>Level III</p>
<p>5. Identify cells, tissues, organs, organ systems, organisms, populations, communities, and ecosystems as levels of organization in the biosphere.</p> <ul style="list-style-type: none"> Identify the levels of organization in the biosphere including cells, tissues, organs, and organ systems, as well as organisms, populations, communities, and ecosystems. 	<p>September AG Weeks 3-4</p>	<p>Cells, tissues, organs, organ systems, organism, populations, communities, ecosystems, biosphere, organelle,</p>	<p>Pod, specific, most likely, in an inverted pyramid, levels of organization in various ways (diagrams, sequencing,etc.), sequence, complex, identified, (pyramid is small-low#, pyramid#, wide-high#) Level 4</p>	<p>Level III</p>
<p>6. Describe the roles of mitotic and meiotic divisions during reproduction, growth, and repair of cells.</p> <ul style="list-style-type: none"> Demonstrate an understanding of how meiosis leads to variation. 	<p>September/ October and February/ March</p>	<p>Mitotic, meiotic, reproduction, variation, chromosome, cell division, haploid, diploid, 2n, n,</p>	<p>Respiration (breathing), chromosomes, cell division, haploid, lifespan, asexual</p>	<p>Level III</p>

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<ul style="list-style-type: none"> Describe the role of meiosis in producing variation. Describe the role of meiosis in reproduction. Describe the role of mitosis in cell repair. Describe the role of mitosis in growth. Describe the role of both mitosis and meiosis. 	AG Weeks 3-4	meiosis variation, cell repair, phases of mitosis, replication, fertilization	reproduction, regenerative, 2n, NOTE: Go over examples such as 1 & 2 are both right. Level 4	
<p>7. Apply Mendel's laws to determine phenotypic and genotypic probabilities of offspring.</p> <ul style="list-style-type: none"> Use Punnett squares to determine phenotypic and genotypic percentages. Recognize dominant and recessive alleles and their roles in determining the phenotypes of offspring. Compare the terms heterozygous and homozygous, and demonstrate an understanding of how these terms relate to phenotypes and genotypes of offspring. 	October/ March AG Weeks 4-5	Phenotypic, genotypic, probability, dominant/ recessive alleles, heterozygous, homozygous, sex-linked	Blood type, go over fractions like 1/6 or 1/4, reasonable, parental, Punnett squares, describe pedigrees, dihybrid & monohybrid cross, probabilities, heterozygous, homozygous, heterozygous for 2 traits, probabilities of offspring, disorder, sex-linked Level 3	Level III
<p>8. Identify the structure and function of DNA, RNA, and protein.</p> <ul style="list-style-type: none"> Recognize that amino acids make up protein. Recognize that proteins can function as enzymes. 	October/ November and March/ April	DNA, RNA, function, protein, nucleotide, amino acids, enzymes, base pairing, genes, chromosomes,	Structure, function, transmit, replicates, sequence, complement, activation, enzyme catalyst,	Level III

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<ul style="list-style-type: none"> Compare the functions of DNA and RNA in the production of protein. Identify patterns of base pairing of DNA and RNA. Recognize DNA as making up genes and chromosomes. 	AG Week 5	catalyst, guanine, thymine, adenine, cytosine, nucleotide, mRNA, tRNA, rRNA, replication, translation, protein synthesis	transports amino acids, replicates itself, transports proteins, complementary strand, DNA/RNA translation, protein synthesis Level 4	
<p>10. Distinguish between monocots and dicots, angiosperms and gymnosperms, and vascular and nonvascular plants.</p> <ul style="list-style-type: none"> Demonstrate knowledge of structures and reproduction, identify the differences in venation patterns, and demonstrate knowledge about the significance of the number of cotyledons. Distinguish between monocots and dicots. Distinguish between angiosperms and gymnosperms. Distinguish between vascular and nonvascular plants. 	December/ May AG Week 7	Monocot, dicot, angiosperms, gymnosperms, vascular, non-vascular, stamens, venation patterns, cotyledons, vascular bundles, fibrous, embryo	Stamens, monocot, dicot, angiosperm, gymnosperm, leaf-variation, parallel veins, ring of vascular bundles, netted arrangement of veins, deep fibrous roots to obtain water, pollination, arrangement of vascular tissue in stem, number of embryo parts Level 4	Level III
<p>11. Classify animals according to type of skeletal structure, method of fertilization and reproduction, body symmetry, body coverings, and locomotion.</p>	November/ April AG Week 6	Skeletal structure, body symmetry, locomotion, invertebrates, vertebrates, compare endo & exoskeleton, bilateral, radial, sexual and	What characteristics are used to determine . . .Radial symmetry, bilateral symmetry, asymmetry, warm-blooded,	Level III

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<ul style="list-style-type: none"> • Compare invertebrates and vertebrates. • Compare endoskeletons and exoskeletons. • Compare internal and external fertilization. • Compare sexual and asexual reproduction. • Compare bilateral and radial symmetry. • Classify animals according to type of skeletal structure. • Classify animals according to method of fertilization and reproduction. • Classify animals according to type of body symmetry. • Classify animals according to type of body coverings. • Classify animals according to type of locomotion. • Classify animals according to multiple physical characteristics. 		asexual reproduction, fertilization, cilia, flagella, endotherm, ectotherm, warm-blooded, cold-blooded, NOTE: show pictures of symmetry	mammal, amphibians, endothermic, ectothermic, two different taxonomic classes, composition of skeleton, habitat, aquatic, terrestrial, excreted, locomotion, adaptation, cilia flagella, adaptation for defense Level 4	
<p>12. Describe protective adaptations of animals, including mimicry, camouflage, beak type, migration, and hibernation.</p> <ul style="list-style-type: none"> • Recognize and apply the definition of mimicry. (The resemblance of one organism to another or to an object in its surroundings for concealment and protection from predators.) • Recognize and apply the definition of camouflage. (The method or result 	September/ February AG Weeks 1-2	Adaptations, mimicry, camouflage, migration, hibernation, look at beak types, protective adaptation, predator, prey, chemical defense	Hibernate, adapt, physical characteristics, spearing, sipping, chiseling, predators, urbanization, deforestation, coloration, behavioral adaptation,	Level II

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<p>of concealing by disguise or protective coloration such that the organism appears to be part of the natural surroundings.)</p> <ul style="list-style-type: none"> Distinguish between different beak types, and identify what each type is used for. Recognize and apply the definition of migration. (The process of changing location periodically, especially by moving seasonally from one region to another.) Recognize and apply the definition of hibernation. (The process of passing winter in an inactive or dormant state.) 			<p>resemble Levels 3-4</p>	
<p>13. Trace the flow of energy as it decreases through the trophic levels from producers to the quaternary level in food chains, food webs, and energy pyramids.</p> <ul style="list-style-type: none"> Trace the flow of energy through food chains, food webs, and energy pyramids. 	<p>August/ September and January/ February AG Weeks 1-2</p>	<p>Trophic level, metabolism, quaternary level, tertiary, food chain, food web, energy pyramid, decomposers, producers, food web</p>	<p>Aquatic, secondary consumers, tertiary consumers, metabolism, tundra, primary consumers, decomposers Level 4</p>	<p>Level III</p>

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<p>14. Trace biogeochemical cycles through the environment, including water, carbon, oxygen, and nitrogen.</p> <ul style="list-style-type: none"> • Demonstrate an understanding of the water cycle. • Describe all events of the water cycle. • Demonstrate an understanding of the carbon cycle. • Describe all events of the carbon cycle. • Demonstrate an understanding of the oxygen cycle. • Describe all events of the oxygen cycle. • Demonstrate an understanding of the nitrogen cycle. • Describe all events of the nitrogen cycle. 	<p>September/ February AG Weeks 1-2</p>	<p>Water cycle, carbon cycle, oxygen cycle, nitrogen cycle</p>	<p>Dependent, temporary reduction, gravity, evaporation, transpiration, precipitation, condensation, fossil fuels Level 4</p>	<p>Levels I, II, III</p>

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<p>15. Identify biomes based on environmental factors and native organisms.</p> <ul style="list-style-type: none"> Identify terrestrial biomes including the tundra, desert, rainforest, grassland, taiga (coniferous forest), and the temperate deciduous forest. Identify the aquatic biomes including freshwater and marine. Identify terrestrial and aquatic biomes based on the rainfall and temperature characteristics. 	<p>September/ February AG Weeks 1-2</p>	<p>Biomes, native, terrestrial, freshwater, marine, aquatic, taiga, tundra, deciduous, desert, rainforest, nutrients</p>	<p>Precipitation, annual, stable, average, budding, division, diversity, permafrost, salt concentrations, topsoil, evergreen, succulents, bromeliads, estuary, semi-arid Level 3</p>	<p>Level I, II, III</p>
<p>16. Identify density-dependent and density-independent limiting factors that affect populations in an ecosystem.</p> <ul style="list-style-type: none"> Identify the limiting factors that affect populations in an ecosystem as either density-dependent or density-independent including natural disasters, space, food, water, air, abiotic and biotic factors, human activity, disease, and succession. 	<p>September/ February AG Weeks 1-2</p>	<p>Density-dependent, density-independent, limiting factors, populations, ecosystems, abiotic, biotic, succession, parasite</p>	<p>Influenza, human-caused, deforestation, susceptible, invasion, fragments, limiting factor, predatory, density dependent, density independent Level 3</p>	<p>Levels III-IV</p>