GBCS Curriculum Guide			GRADE:		SUBJECT:			
Topic	**Pacing**	**Unit**	**Standards**	**Enduring Understandings & Essential Questions**	**Learning Targets**	**Vocabulary/Concepts**	**Materials**	**Assessments**
Earth Systems and Resources	10-15%		Earth Science Concepts The Atmosphere Global Water Resources and Use Soil and Soil Dynamics	What processes that shape the earth and its resources? What is the general composition and structure of the atmosphere? What are some factors that determine natural climate variability? What determines global wind patterns? How does ENSO affect global climate patterns? Where is water, both fresh and salt, located and how does human use alter it? How does water circulate in the ocean? What is the role of irrigation in world water consumption? How is water used by humans at home and at work? How do humans affect surface and groundwater? How have water problems affected people around the world? What are the methods and issues surrounding water conservation? How does soil form? What are the chemical and physical properties of soil? How does soil become eroded? What are the methods for soil conservation?		Surface Water Watershed Aquifer Confined/unconfined aquifer Water table Clean Water Act Floodplain Aquifer depletion Saltwater intrusion Oligotrophic Mesotrophic Eutrophic Dams Desalinization Plate tectonics Albedo Troposphere Stratosphere Mesosphere Thermosphere Exosphere Trade Winds Coriolis Effect Gyre Ocean Current Ocean Conveyer Belt Climate Weather		
The Living World	10-15%		Ecosystem Structure Energy Flow Ecosystem Diversity Natural Ecosystme Change Natural Biogeochemical Cycles	How are ecosystmes structured? What is an ecological niche and how does it contribute to a functioning ecosystem? How does species diversity contribute to a functioning ecosystem? How do species interact within an ecosystem? What are the major terrestrail and aquatic biomes? How does photosynthesis and respiration play a role in energy flow through an ecosystem? What are the roles of different species in a food web? How is biodiversity formed in an ecosystem? What types of services are provided by ecosystem? What is succession? How are nutrients moved through an ecosystems so that life can be maintained?		Biotic Abiotic Food Web Food Chain Ecology Community Population Organism Atmosphere Biosphere Lithosphere Hydrosphere 1st Law of thermodynamics 2nd law of thermodynamics Net Primary Productivity Gross Primary Productivity Net Secondary Productivity Gross Secondary Productivity Open System Closed System Respiration Photosynthesis Decomposer Autotroph Scavenger Trophic Level Pyramid of Numbers Pyramid of Biomass		

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Population	10-15%		Population Biology Concepts Human Population Dynamics Human Population Size Impacts of Human Population Growth	How are populations measured and described? What determines carrying capactiy in an ecosystems? How do differing reproductive strategies affect population size? How do the dynamics of population growth affect the survivorship of populations? How has the size human population changed over time? What are fertility rates around the world and how do they affect population size? How is the human population distributed around the world? What is demographic transition? How does the age structure of a population affect public policy? How do the impacts of population growth compare in developing and nondeveloping countries? What are strategies for sustainabile human population growth? How has habitat destruction differed around the world?		Zero Population Growth Migration Developed Country Developing Country Moderately Developed Country Infant Mortality Rates Replacement Level Fertility Total Fertility Rate Demographic Transition Population Growth Momentum Age Structure diagram Doubling Time		
Land and Water Use	10-15%		Agriculture Forestry Rangelands Mining Other Land Use Fishing	What are the methods used to feed a growing population? What are human nutritional requirements? What are the various method of agriculture and how do they differ throughout the world? What is the green revolution and how has it changed the sustainablity of agriculture? What are GMOS and how have they affected crop production? How are pests controlled safely? What public policies are in place to ensure the safety of our food supply? What are the different methods of managing our forests? What is New Forestry and how does it protect our forests? How do forest fires affect the forest? How has US forest policy on fires altered our forests? How has overgrazing affected our rangelands? What is desertification and its affects on our rangelands? How can public policy be used to appropriately manage our land? What is urban sprawl and its affects on land? What is sustainable development and what are the goals? How are minerals formed? How are minerals extracted and how much do we have? What are the affects of mining on ecosystems? What are the impacts of fishing? Is it sustainable? What fishing techniques are used?		Pesticide (insecticide, herbicide, fungicide, rodenticide) Narrow-Spectrum Pesticide Broad-Spectrum Pesticide 1st Generation Pesticide 2nd Generation Pesticide Synthetic DDT/chlorinated hydrocarbon Organophosphates Pesticide Treadmill Resistance management Endocrine Disrupter Integrated Pest Management System (IPM) Cultivation methods (as related to pest control) Biological Control Pheromones Reproductive Controls Genetic Controls Pesticide Chemicals Amendment FIFRA Food Quality Protection Act Persistent Organic Pollutant (POP) Surface Mining Strip Mining Overburden Spoils Bank Subsurface Mining Surface Mining Control and Reclamation Act Acid Mine Drainage		

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Energy Resources and Consumpstion	10-15%		Energy Concepts Energy Consumption Nonrenewable Energy Resources and Use Energy Conservation Renewable Energy	What are the different forms of energy? How is energy measured? How is energy converted from one form to another and how efficient is it? How has the consumption of energy changed over time? How much energy do we use and what are the world's future needs? How are the different nonrenewable energies formed and extracted? What are the advantages and disadvantages of all types of energies- both renewable and nonrenewable? How is nuclear energy generated? How is electricity produced? How is energy efficiency improved? What are CAFE standards and how do they drive efficiency? How is energy produced from various renewable energy sources: solar, hydrogen fuel cells, biomass, wind, hydroelectric, tides, geothermal?		Energy Consumption Energy Services Energy Conservation Energy Efficiency LEED building Cogeneration Turbine Generator Electricity Hydrogen Fuel cells Peat Coil Oil Natural Gas/ LNG Reserve Carbon capture and storage Cogeneration Fracking Oil Pollution Act Arctic National Wildlife Refuge Fossil Fuels Minerals : Metals and non-metallic Ore Rock Cycle Open-pit mining Smelter Tailings		
Pollution	25-30%		Pollution Types: Air, Noise, Water and Solid Waste Impacts on the Environments and Human Health Economic Impacts	What are sources or primary and secondary air pollution? What are the major air pollutants and how do they affect ecosystem health, including humans? How is pollution measured? What is smog and how is it formed? What caused acid depostions and what are its effects? How is pollution remediation and reduction completed? What are the relevant laws that limit pollution? What are sources of noise pollution? What are the effects of noise pollution and how do we control it? What are the sources of water pollution? How do we maintain water quality? What are the various methods of water purification? How do we treat sewage? What is in our solid waste? How is a modern landfill designed and what are the potential problems that could arise? How do we reduce our waste and its impact on ecosystems? How do we remediate sites that have been contaminated from various pollution? What are the acute and chronic effects of pollution on humans? How do we assess risk and manage it? How do we determine a cost-benefit analysis of our exposure to pollution while balancing the economic impacts? What are mariginal costs?		Sewage Enrichment Cellular Respiration Biological Oxygen Demand (BOD) Dissolved Oxygen (DO) Dead Zone Point pollution Nonpoint pollution Fertilizer runoff Pharmaceuticals, microbeads, microfleece Fecal Coliform Sediment pollution Turbidity Runoff PPM/PPB Thermal Pollution Primary treatment Primary sludge Secondary treatment Secondary sludge Aeration Ocean Dumping Ban Act North Pacific Garbage Patch Septic tank Maximum contaminant level Safe Drinking Water Act National emission limitations NPDES		

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Global Change	10-15%		Stratospheric Ozone Global Warming Loss of Biodiversity	How is stratospheric ozone formed? How does ultraviolet readiation play a role in ozone depletion? What are the effects of ozone depletion? What are strategies for reducing ozone depletion? What are the relevant laws and treaties that protect our atmospehere? What is the greenhouse effect and what are greenhouse gases? What are the impacts and consequences of global climate change? How can we reduce climate change? What is the data that supports a changing climate? What are the main componenets that drive the loss of biodiverstiy? How can we maintain biodiversity through conservation methods? What are the relevant laws and treaties that protect the biodiversity of the world?		Greenhouses gases CFCs Carbon Dioxide Emitters IPCC ocean adicity cap and trade Kyoto Protocol Montreal Protocol Clean Air Act Endangered species Act CITIES Lacey Act Habitat Loss Invasive Species Pollution Population Growth Climate Change Overconsumption Nature Preserve Wildnerness Reintroduction Captive Breeding		