# Earth Science NC Final Review

## E/En 1.1 Explain Earth’s role (position) as a body in space.

1. How is Earth’s motion related to the origin of the galaxy and its solar system?

**Earth orbits the Sun rotates within the solar system, which rotates in Milky Way Galaxy, which moves in the Universe due to expansion.**

1. What is Earth’s position in the hierarchy of organization within the universe?

**Earth 🡪 Solar System 🡪 Orion Arm of Milky Way Galaxy 🡪 Local Group 🡪 Virgo Supercluster 🡪 Universe**

1. How do Kepler’s laws describe planetary orbits (esp. Earth’s)?

**1st Law (Law of Orbits): All planets move in elliptical orbits with the sun as one focus. (Earth orbit is an ellipse.)**

**2nd Law (Law of Areas): A line that connects a planet to the Sun sweeps out equal areas in equal time. (Earth sweeps out a longer path when it is closer to the Sun. Earth moves fastest when it is closest to the Sun.)**

**3rd Law (Law of Periods): The square of the orbital period of any planet is proportional to the cube of the semi major axis of its orbit. (The closer a planet’s orbit is to the Sun, the short its orbital period or year will be.)**

1. What is the relative motion of Earth in the solar system, the solar system in the galaxy, and the galaxy in the universe?

**Earth orbits the Sun rotates within the solar system, which rotates in Milky Way Galaxy, which moves in the Universe due to expansion.**

1. What motion causes a year?

**A year is caused by the revolution of the Earth around the Sun.**

1. What motion causes day and night?

**Day and night are caused by the rotation of Earth on its axis – spinning towards and away from the Sun.**

1. What is precession?How does it change the climate?

**Precession is the wobble in Earth’s rotational axis. Climate changes due to the changing position of the hemispheres. Eventually the Northern and Southern hemispheres will change positions.**

1. What is nutation? How does it change the climate?

**Nutation is the change in the angle of tilt of Earth’s axis. If the angle of the tilt decreases, the temperature difference between seasons would lessen. If the angle of the tilt increases, the temperature difference between seasons would greaten.**

1. What is barycenter? Why does the Sun wobble?

**Barycenter is the center of mass between a planet and the Sun. The sun wobbles around in its orbit because the planets are pulling on it as they orbit.**

1. What causes the seasons?

**The tilt and the ecliptic plane of the Earth causes the seasons.**

1. When are winter, spring, summer, and fall in each hemisphere? Relate this to Earth’s tilt.

**Northern Hemisphere:**

 **Summer - Tilted toward the Sun**

 **Fall – Facing away from the Sun**

 **Winter – Tilted away from the Sun**

 **Spring – Facing toward the Sun**

**Southern Hemisphere:**

 **Summer (Their Winter) – Tilted away from the Sun**

 **Fall (Their Spring) – Facing toward the Sun**

 **Winter (Their Summer) – Tilted toward the Sun**

 **Spring (Their Fall) – Facing away from the Sun**

1. Why are seasons opposite in the Northern and Southern hemispheres?

**The seasons in the Northern and Southern Hemispheres are opposite each other because when one hemisphere is tilted towards the Sun, the other is tilted away from it.**

1. What force and motion causes the circumference of Earth to be larger around the equator than around the poles?

**Centrifugal force and Earth’s rotation causes the circumference of Earth to be larger around the equator than around the poles.**

1. What is fusion?

**Fusion is the fusing of smaller, lighter hydrogen atoms to form a larger, heavier helium atom (which releases energy).**

1. Where in the universe does fusion occur naturally?

 **Fusion occurs in the stars (our Sun) naturally.**

1. How does fission differ from fusion? (Where does fission occur on Earth?)

**Fission is the splitting of bigger, heavy atoms into smaller, lighter atoms where as fusion is the joining of smaller, lighter atoms into bigger, heavy atoms. Fission occurs in nuclear power plants and submarines.**

1. What is **combustion**? How does **combustion** differ from fusion or fission?

**Combustion is the burning of a fuel in presence of oxygen to produce energy in the form of heat and light. This differs from fusion or fission in that atoms are not split or fused; they are rearranged.**

1. What forms of energy are produced by the sun?

**The Sun produces electromagnetic radiation across the spectrum (radio waves, microwaves, infrared energy (heat), visible light ultraviolet radiation, x-rays, and gamma rays).**

1. What are electromagnetic waves?

**Electromagnetic waves are waves that are formed from electric and magnetic disturbances that travel through space.**

1. How are ultraviolet rays filtered or blocked by our atmosphere?

**Ultraviolet rays are filtered/blocked by our atmosphere by the ozone layer (in the stratosphere).**

1. How are cosmic rays blocked?

**Cosmic rays are blocked by Earth’s magnetic field.**

1. By what three processes does the Sun’s energy warm the Earth and its atmosphere?

**The three process are radiation, conduction, and convection.**

1. What is radiation?

**Radiation is the transfer of energy through space by electromagnetic waves (visible light, ultraviolet radiation, and others.**

1. What is conduction?

**Conduction is the transfer of energy that occurs when molecules collide. This is how air molecules above Earth’s surfaces are warmed.**

1. What is convection?

**Convection is the transfer of energy by the flow of a heated substance. Warm air rises and cold air sinks.**

1. Which takes longer to warm or cool – land or water?

**Water takes longer to warm and cool.**

1. How does the differential heating of land and water cause wind?

**Differential heating of land and water causes wind due to pressure differences between land and water.**

1. How does the **differential heating** of land and water affect coastal climates?

**It moderates the climate. In winter, the ocean acts like a giant heater and in the summer, the ocean acts like a giant air conditioner.**

1. What is photosynthesis?

**Photosynthesis is the process where solar energy is converted into chemical energy (food).**

1. How is solar energy transformed into chemical energy through photosynthesis?

**Carbon dioxide mixes with water to produce oxygen and sugar**

1. What is Earth’s magnetic field?
2. What creates the magnetic field?

**Earth’s magnetic field is created by Earth’s magnetic core.**

1. How does it protect us from the harmful effects of the Sun’s radiation?

**Earth’s magnetic field protects us from the solar wind by deflecting these particles and trapping them in two huge rings (Van Allen belts).**

1. **What is an - Ellipsoid celestial body that is flattened at the poles and bulging at the equator… do not confuse with an elliptical orbit**

## E/En 2.1: Explain how processes and forces affect the lithosphere.

## E/En 2.2.1: Understand how human influences impact the lithosphere.

1. What are the processes that change one type of rock into another type in the rock cycle?

**The process that change one type of rock into another type in the rock cycle are melting, cooling, solidification, deposition, burial, lithification (compaction and cementation), heat, and pressure.**

1. What processes form igneous rocks?

**The processes that form igneous rocks are melting, cooling, and solidification.**

1. What processes form sedimentary rocks?

**The processes that form sedimentary rocks are deposition, burial, and lithification (compaction and cementation).**

1. What processes form metamorphic rocks?

**The processes that form metamorphic rocks are heat and pressure – without melting.**

1. What is weathering? How is it related to the rock cycle?

**Weathering is the process by which big pieces of rocks are broken down into smaller pieces. Weathering is the process that changes igneous rocks into sedimentary rocks.**

1. What is the difference between **chemical weathering** and **physical weathering**?

**Physical weathering is the process where rocks and minerals break down into smaller pieces while chemical weathering is the process by which rocks/minerals undergo changes in composition as result of chemical reactions.**

1. What are ways that rocks can be chemically weathered? Physically weathered?

**Chemically Weathered:**

* + **Water: dissolves minerals and rocks**
	+ **Oxygen: combines with iron in rocks and minerals**
	+ **Carbon Dioxide: combines with water in atmosphere or soil forming weak carbonic acid**
	+ **Acid Precipitation: precipitation mixed with gases in the atmosphere that turn it into acid rain**

**Physical Weathering**

* + **Frost Wedging: water in cracks expands as it freezes, wedging the rock apart and splitting it**
	+ **Exfoliation: overlaying rocks removed by erosion, pressure reduced, outer layers crack and are stripped away**
1. In which type of climate do rocks experience more chemical weathering? Physical weathering?

**Chemical weathering happens more rapidly in climates that are warm and humid (tropical places) , such as Central America and South East Asia. Physical weathering happens more rapidly in climates that can get cold.**

1. Which types of rocks are more easily physically weathered?

**Sedimentary rocks are more easily weathered than harder igneous and metamorphic rocks.**

1. What type of weathering produces caves and clay?

**Chemical weathering, in the form of carbon dioxide, causes weathering in clay and caves.**

1. How does weathering help to make soil?

**The weathering of rocks into smaller sediments over time creates soil.**

1. What is **soil**?

**The weathering of rocks into smaller sediments**

1. How do the three particle types of soil (clay, silt, sand) differ?

**Particles of soil are classified by size – clay being the smallest and sand being the largest.**

1. How can a soil texture triangle be used to determine the texture of soil in a location?

**A soil texture triangle uses the relative proportions of sand, silt, and clay to determine its texture, which determines its capacity to absorb and retain water and support plant growth.**

1. What is the difference between renewable and nonrenewable resources?

**A renewable resource is a resource that can be used indefinitely while a nonrenewable resource exist in a fixed amount and can only be replaced by processes that take thousands of years.**

1. What is erosion?

**Erosion is the process that transports Earth’s materials from one place to another.**

1. How does water cause erosion?

**Water has more power to move large objects. Rocks exposed to their surrounding environments are slowly weathered away then rivers carry those sediments away.**

1. How does wind cause erosion?

**Wind causes erosion by transporting sediment from one area to another.**

1. How do glaciers cause erosion?

**Glaciers change Earth’s surface by scraping and gouging out large sections of land, carry huge rocks and pile debris over great distances, and by polishing rocks.**

1. What are the types of mass movements of Earth materials due to the force of gravity? How do the following types of mass movements change Earth’s surface – landslides, slumps, avalanche, rock slide (fall), creep?

**Mass movements are the downslope movement of loose sediments or weathered rock due to gravity. The types are:**

* **Landslide: thin block of loose Earth that slides on bedrock than can be triggered by earthquakes and excess rain**
* **Slump: a mass of Earth material that rotates and slides along a curved surface that causes crescent-shaped scars**
* **Avalanche: a landslide in snowy mountainous areas that changes the Earth’s surface by moving large amounts of Earth down**
* **Rock Falls: falling rocks that cause road blocks and destruction to property**
* **Creep: the slow, steady, downhill flow of loose, weather material that changes the landscape by causing everything on it to tilt**
1. What is the effect of human activity on shorelines? What are artificial stabilization efforts used to prevent shore erosion? (What is a jetty, groin, seawall, breakwater?)

**Human activity impacts the shoreline by increasing erosion along a beach shore.**

* **Jetty: a concrete wall that keeps harbor entrances clear of sand but causes erosion of beaches downshore**
* **Groin: traps beach sand which increases erosion downshore**
* **Seawall: prevents the destruction of beachfront property by reflecting waves to beach which increases erosion**
* **Breakwater: protects small boats but causes the shore side to fill with sand**
1. What is the theory of plate tectonics? What tectonic features do scientists look at on a world map that indicates that Earth’s lithosphere is broken into giant plates?

**The theory of plate tectonics states the Earth’s rigid crust and upper mantle (lithosphere) is broken into large plates. Scientists look for cracks in the Earth’s crust.**

1. How are the plates moving at each of the following plate boundaries - divergent, convergent, transform?
* **Divergent: plates separate (divide)**
* **Convergent: plates are moving toward each other (converge)**
* **Transform: slide horizontally past each other**
1. How do the forces of **ridge push** and **slab pull** move the tectonic plates?
* **Ridge push: force created by weight of uplifted ridge, which pushes an ocean plate towards a trench**
* **Slab pull: weight of subducting plate pulls trailing plate into subduction zone**
1. What geologic events/landforms occur at of the following plate boundaries – divergent, convergent (ocean/ocean), convergent (ocean/continental), convergent (continental/ continental), transform? Answer the following questions. Studying diagrams would be immensely helpful!!
	1. At which boundary is seafloor spreading occurring?

**Divergent boundary**

* 1. Which of the boundaries form fissure volcanoes, a rift valley, or a midocean ridge?

**Divergent boundary**

* 1. Which of the boundaries form volcanic islands?

**Convergent boundary (ocean/ocean)**

* 1. Which of the boundaries form a volcanic mountain range near a coastline?

**An ocean/continental convergent boundary**

* 1. At which boundary is an ocean trench present?

**Subduction**

* 1. What forms an ocean trench?

**Convergent boundary**

* 1. What is a subduction zone? What often forms above a subduction zone?

**A subduction zone is an area where one plate goes under another. A volcanic island arc often forms.**

* 1. Where is the ring of fire?

**The ring of fire is the locations of volcanoes that occur at plate boundaries.**

1. What is a volcano?

**A volcano is a mountain or opening in Earth’s crust from which lava eruopts**

1. What is the difference between magma and lava?

**Magma is a mixture of molten rock, suspended mineral grains, and dissolved gases beneath Earth’s surface while lava is molten rock that has reached Earth’s surface**

1. What causes an earthquake?

**An earthquake is a natural vibration of the ground caused by movement along gigantic fractures in Earth’s crust**

* 1. What is stress? What do - compression, tension, shear - result in?
* **A stress is the force per unit area acting on a material.**
* **Compression decreases the volume of a material.**
* **Tension pulls a material apart.**
* **Shear causes a material to twist.**
	1. What is a fault?

**A fault is a fracture along with movement occurs.**

* 1. What type of stress and rock movement are found at each of the 3 types of faults - reverse, normal, strike-slip?
* **Reverse Fault: forms at convergent boundaries and occurs due to compression; Block above fault moves up and over**
* **Normal Fault: forms at divergent boundaries and occurs due to tension; Block above fault moves down**
* **Strike-slip Fault: forms at transform boundaries and occurs to shearing; Blocks slide past each other**
	1. What are seismic waves?

**Seismic waves are the vibrations of the ground during an earthquake**

 How do the following types of seismic waves - primary, secondary, surface **-** move the rocks through which they travel? Which are fastest? Which do the most damage?

* **Primary (P) waves: squeeze (push) and pull rocks in the same direction as the wave; Fastest**
* **Secondary (S) waves: rocks move at right angles to the direction of the wave**
* **Surface waves: wave that moves in 2 directions (up/down and side/side); Slowest; Most damaging**

What does a Travel-Time Graph show?

**A travel-time graph shows the average time of P and S waves that is used to calculate the distance to the epicenter**

What is the focusof an EQ? What is the epicenter? How can an EQ’s epicenter be located?

**The focus of an earthquake is where the rocks break at least several miles beneath Earth’s surface. The epicenter is the location on Earth’s surface just above the focus. The epicenter can be located by using a travel-time curve.**

1. Which of our states have the highest seismic risk? What is North Carolina’s seismic risk? Is it the same across the state?

**Highest seismic risk: California, Alaska, Hawaii, Utah, Nevada**

**North Carolina: Moderate seismic risk in Piedmont and mountains; Low seismic rick in coastal plains**

1. Where on Earth do most EQs occur?

**Most earthquakes happen at tectonic plate boundaries (Ring of Fire, Mediterranean, mid-ocean ridge)**

1. What precautions can be taken to prevent the loss of human life and destruction to property due to EQs?

**Better buildings,**

## E/En 2.3: Explain the structure and processes within the hydrosphere.

## E/En 2.4: Evaluate how humans use water.

1. When sea ice melts, the water gets cold and salty and sinks - why?
	1. Where does cold water from the poles go?
	2. What does deep ocean water do as it reaches the equator and warms?
2. How do each of these processes of the water cycle work? evaporation, transpiration, condensation, precipitation, and infiltration.
* **Evaporation: moisture from the water changes into gas**
* **Transpiration: moisture from the land changes into gas**
* **Condensation: process where liquid changes into a solid**
* **Precipitation: water that falls back to earth**
* **Infiltration: the process where water seeps into the ground**
1. What is the connection between **surface water** and **groundwater**? How does each turn into the other?

**The water cycle**

1. What are the following parts of a river? – river, tributaries, watershed, divide, floodplain, meander, headwaters, and mouth?

**River: a large stream**

**Tributaries: the smaller streams that feed into a river**

**Watershed: all of the land area whose water drains into s stream system**

**Divide: a high land area that separates one watershed from another**

**Floodplain: a broad, flat, fertile area next to a stream that floods periodically**

**Meander: a bend or curve in a stream channel**

**Headwaters: the beginning of a stream**

**Mouth: the end of a stream that is usually located at the ocean or another body of water**

1. What causes floods? How do groundwater levels affect flooding?

**Floods occur when water overflows a stream’s bank. It is more likely to flood when groundwater levels are high since the aquifer is already full.**

1. What is an **estuary**? Where does the fresh and salt water come from? How would an upstream **drought** affect the water in an estuary?
2. Where is most of Earth’s water? Where is most of Earth’s fresh water?

**Most of Earth’s water is found in the oceans (97%). Most of Earth’s fresh water is found in the polar ice caps and glaciers (90%).**

1. How are the following terms describing groundwater defined – porosity, aquifer, aquiclude, zone of saturation, water table?
* **Porosity: the percentage of pore space in a material**
* **Aquifer: an underground storage area for water**
* **Aquiclude: an impermeable layer above or below an aquifer**
* **Zone of Saturation: the depth below surface where groundwater completely fills all the pores**
* **Water Table: the upper boundary of the zone of saturation**
1. What is awell?

**A well is a hole dug to reach groundwater**

1. The following are consequences of the **overuse of groundwater**…
	1. What is drawdown?

**Drawdown is the difference between the original water table level and that of a pumped well.**

* 1. What is **aquifer depletion**?
	2. What is subsistence?

**Subsidence is when the ground near an overused well sinks**

* 1. What causes salt-water intrusion into wells in coastal areas?

**Salt water from the ocean enters an aquifer and makes the water undrinkable.**

1. What are some **threats** to our groundwater supplies?
	1. What **substance** is drawn up when wells are over pumped?
	2. Can most chemical contaminants **be easily removed** from groundwater?
	3. How can our groundwater be protected and restored?

## E/En 2.5: Understand the structure of and processes within our atmosphere.

1. What is the most abundant gas in the atmosphere? By what percent? The second most? By what percent?

**The most abundant gas in the atmosphere is nitrogen (78%) followed by oxygen (21%).**

1. What are the functions/importances of the following substances in the atmosphere… oxygen, carbon dioxide, ozone, water vapor, water, ice, dust and salt
* **Gas: gas organisms need to break down food for energy**
* **Carbon Dioxide: gas that plays a minor role in absorbing heat**
* **Ozone: gas that absorbs ultraviolet radiation from the sun**
* **Water Vapor: gas that plays a major role in absorbing heat**
* **Water: liquid that is the source of rain**
* **Ice: solid that makes up snow, sleet, and hail**
* **Dust and Salt: solids that provide a solid surface for water vapor to condense**
1. What are the characteristics and composition of the 5 layers of the atmosphere – troposphere, stratosphere, mesosphere, thermosphere, exosphere? What is found in each?
* **Troposphere: lowest layer in the atmosphere where weather, life forms and jets are located**
* **Stratosphere: layer that contains the ozone layer**
* **Mesosphere: layer that contains meteors that burn up**
* **Thermosphere: layer that contains the ionosphere and the auroras**
* **Exosphere: layer that contains satellites**
	1. Where is the ozone layer? Why is it so important to life on Earth?

**The ozone layer is found in the stratosphere which absorbs the ultraviolet radiation from the sun.**

* 1. How does the temperature, pressure, & density vary as one moves up the troposphere?

**The troposphere increases in temperature, pressure and density as it moves up in the troposphere.**

* 1. What characteristic is used to identify the layers of the atmosphere?

**Heat is the characteristic used to identify the layers of the atmosphere.**

* 1. Why is the thermosphere said to be the hottest layer when it feels so cold up there?

**The thermosphere is the hottest layer of the atmosphere but it feels so cold because even though molecules are moving very fas, they are so far apart that there is no heat transfer.**

1. How much of the sun’s energy does Earth’s surface **absorb**? What happens to the rest of it?

**65% of the sun’s energy is absorbed by Earth’s surface. The rest (35%) is reflected back into space.**

1. If warm air and cold air collide, which will rise?

**Warm air rises and cold air sinks.**

* 1. Why does warm air rise?

**Warm air rises because it is less dense.**

* 1. Why does cold air sink?

**Cold air sinks because it is more dense.**

1. What creates wind?

**The air moving from an area of high pressure to an area of low pressure.**

1. What is the difference betweenweather and climate?

**Weather is the current state of the atmosphere while climate is the average weather for a specific location for a long period of time.**

1. What are the location and characteristics of the 5 major air masses that affect the weather of the USA? continental tropical, maritime tropical, continental polar, continental tropical, Arctic
* **Continental Tropical (cT): forms over tropical lands which bring warm dry air**
* **Maritime Tropical (mT): forms over tropical waters which bring warm humid air**
* **Continental Polar (cP): forms over colder lands which brings cool dry air**
* **Maritime Polar (mP): forms over colder waters which brings cool humid air**
* **Arctic (A): forms over Arctic land which brings very cold dry air**
1. What causes the four types of fronts - cold, warm, stationary, occluded? Identify symbols for each & describe the weather & clouds each causes. What happens to temperature of an area after each passes?
* **Cold front (blue triangles): cold, dense air displaces warm air and forces it up a steep front which brings clouds, showers, and thunderstorms**
* **Warm front (red semicircles): advancing warm air displaces cold air and moves up slowly and causes extensive cloudiness and precipitation**
* **Stationary front (blue triangles alternate with red semicircles): two air masses meet and neither advances and causes some clouds and precipitation**
* **Occluded front (purple alternating semicircles/triangles): a cold air mass moves so rapidly that it overtakes a warm front and wedges the air up and causes precipitation on both sides of the front**
1. Be able to read a weather map! What are isobars? Isotherms? What type of wind is represented by isobars that are close together? (strong or weak?)

**Isobars connect points of equal pressure while isotherms connect points of equal temperature. Isobars that are closer together indicate stronger winds.**

1. Describe the 2 types of pressure systems – high and low. Recognize the symbol for each. What kind of weather do they cause?

**High Pressure System: brings fair weather**

**Low Pressure System: brings clouds and precipitation**

1. Where do the majority of thunderstorms occur in the USA?

**The majority of thunderstorms occur in Florida.**

* 1. Where is the safest place to be during a thunderstorm?

**The safest place to be during a thunderstorm is a room near no windows.**

1. What is a tornado?

**A tornado is a wave cyclone that forms on land from rotating winds.**

* 1. Where is the safest place to be in during a tornado?

**The safest place during a tornado is a basement or an interior room/fall on the lowest floor.**

1. What is a tropical cyclone? (a hurricane?)

**A hurricane is a large, rotating, low pressure storm.**

* 1. Where do cyclones derive their energy? What causes them to lose strength?

**Tropical cyclones derive energy from warm, tropical oceans and lose strength as they move onto land.**

1. Hurricane Hazards…
	1. Where are the strongest winds in a hurricane?

**The strongest winds in a hurricane are in the eye wall.**

* 1. What is a storm surge? What kills 9 out of 10 people who die in hurricanes?

**A storm surge is when hurricane force winds drive a mound of ocean water towards coastal areas. Storm surges kill 9 out of 10 people in a hurricane.**

* 1. What is the number 1 safety tip for surviving a **hurricane**?

**Evacuate!**

## E/En 2.6: Analyze patterns of global climate change over time.

## E/En 2.7: Explain how the lithosphere, hydrosphere, and atmosphere individually and collectively affect the biosphere over time.

1. What are 3 factors that describe the climate of a location?

**The factors that describe the climate of a location are temperature, wind, and precipitation.**

1. Where is each of the followingclimate zones located - tropics, temperate, polar?

**The polar region is located at the poles. The tropical region is located the equator.**

* 1. In general, what temperatures would you experience in each zone?

**Polar (-23 to -7°C); Temperate (-7 to 24°C); Tropical (24 to 26°C)**

* 1. Why does it get colder as one moves toward the poles?

**Cold air sinks**

1. What is the rainshadow effect? What does it create on the leeward side of a high mountain range?

**The rain shadow effect is when the windward side gets rain but the leeward side gets no rain.**

1. How do ocean currents affect climate?
	1. Which current affects our climate? California’s? On which coast would you find cold currents? Warm currents?

**East coasts have warm currents due to the gulf stream while the west coasts have cold currents due to the Bering Sea.**

1. How do coastal climates differ from continental (inland) climates? Why?

**Coastal climates are more temperate than continental climates due to differential heating.**

1. What does the Koeppen classification system classify?

**It classifies climate zones.**

1. Are coastal areas cooler or warmer than inland areas in the winter? (Think about the difference in temperature between Clemmons and Wilmington.)

**Coastal communities are cooler in the summer and warmer in the winter.**

1. What is a heat island? Give an example.

**A heat island is a localized place where climate is warmer than the area around it (lots of building and little vegetation).**

1. What is an ice age? How does an ice age affect sea level?

**An ice age is a period of extensive glacial coverage. The sea level decreases.**

1. What is El Niño?

**El Nino is when a warm current develops off the Western coast of South America and can cause short-term, worldwide climatic changes.**

* 1. Which **current** is affected? How does pressure change in the Pacific Ocean?

**South American current**

* 1. Why is the **cold upwelling** along the Peruvian Coast so important?
1. How do the absence (or presence) of sunspots affect Earth’s climate? Why was the Maunder Minimum (Little Ice Age) so cold?

**The absence of sunspots decreases Earth’s temperatures. The Maunder Minimum was so cold due to absence of sunspots.**

1. How does a more elliptical orbit affect Earth’s climate?

**The more elliptical the orbit, the closer the Earth passes and temperatures rise.**

1. How do large volcanic eruptions affect Earth’s climate?

**Large volcanic eruptions tend to cool the Earth because the volcanic ash and dust block solar radiation.**

1. How does extra **carbon dioxide** in the atmosphere affect Earth’s climate? (Answer this question with the standard statement about CO2 being a toxic, greenhouse gas that causes global warming - for your Exam!)
	1. How do changes in global temperatures affect agriculture?

**Crops would change due to climate change.**

* 1. How do changes in global temperatures affect species diversity (esp. amphibians)?

**Specific diversity will alter the numbers of species**

* 1. How do changes in global temperatures affect ecosystem balance?
	2. How do changes in global temperatures affect weather events?

**More hurricanes will occur since the temperature of the ocean water will increase.**

* 1. How do changes in global temperatures affect sea level? (esp. during warming) Related to this…
		1. How do glaciers affect sea level?

**As glaciers melt, the sea level increases.**

* 1. How are the **shorelines and barrier islands of NC** affected by sea level rise?

**Barrier islands and shorelines will decrease or disappear as sea level rises.**

1. What is the biosphere?

**The biosphere is all the life on Earth.**

1. What is biodiversity?

**Biodiversity is the number and variety of species on Earth.**

* 1. What is genetic biodiversity? Why is it important? What is a species that has lost genetic biodiversity?

**Genetic diversity is the difference in genetic makeup within a species. Insects has lost genetic biodiversity.**

* 1. Which biome has the mostbiodiversity? Why?

**The biome with the most biodiversity is rainforest because it is warm and has lots of water available for living things.**

* 1. Which biome has the least biodiversity? Why?

**The biomes with the least biodiversity are the tundra because it is very cold and there is very little liquid water available followed by the desert because it has the least water available.**

1. What are 5 things that can reduce biodiversity?

**Habitat alteration, Urbanization, Invasive species, Pollution, Overharvesting**

* 1. Specifically, what is an invasive species? How does it impact biodiversity? What is an example of an invasive species here in NC?

**An invasive species is one that is not native to an area. It reduces biodiversity because it has no natural enemies and native species have no defences.**

* 1. What is overharvesting?

**Overharvesting is the excessive fishing and harvesting of plants which reduces biodiversity by reducing population of harvested species.**

* 1. What is habitat alteration?

**Habitat alteration changes of a natural habitat** .

1. What impact does the **loss of** biodiversit**y** have on our society – local and global?

**The loss of biodiversity affects our survival needs on a global scale (food, water, air, shelter, energy).**

1. How can we prevent the loss of biodiversity?

**To prevent the loss of biodiversity, death and wars must be eliminated.**

## E/En 2.8: Evaluate human behaviors in terms of how likely they are to ensure the ability to live sustainably on Earth.

* + - 1. What methods do we use to obtain… peat & wood, natural gas & petroleum (oil), uranium & coal?
* **Peat and wood: harvesting (collecting from nature)**
* **Natural gas and Petroleum (oil): drilling and fracking (natural gas)**
* **Uranium: mining**
* **Coal: mining (surface pit or underground)**
	+ - 1. What are the consequences of the following activities on the lithosphere? Mining? Harvesting? Drilling?
* **Mining: loss of habitat and pollution**
* **Harvesting: loss of trees if not replanted**
* **Drilling: nonrenewable**
	+ - 1. What are the benefits, costs, and environmental impact of the following types of alternative energy – solar, wind, biofuels, nuclear fusion, fuel cells, wave power, and geothermal?

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Benefits** | **Costs** | **Env. Impact** |
| **Solar** | **Clean and quiet** | **Expensive** | **Negligible**  |
| **Wind**  | **Free and clean** | **Expensive** | **Noisy, unsightly, can kill migrating birts** |
| **Biofuels** | **Renewable**  |  | **Disrupts the recycling of nutrients back into the ecosystem and generates pollution** |
| **Nuclear Fusion** | **Clean** |  | **None** |
| **Fuel Cells** | **No pollution** | **Expensive** | **Hydrogen must be in proper form.** |
| **Wave Power** | **Free** | **Expensive** | **Disturb coastal habitats** |
| **Geothermal** | **Free** | **Expensive** | **Habitat disturbance and the disposal of large quantities of noxious gases and very salty water** |

* + - 1. Which of the energy sources listed above would work best in the mountains, piedmont, and coastal plains of NC? Why?

**Solar, Wind, Wave Power**

* + - 1. What are the advantages and disadvantages of traditional aquaculture? Sustainable aquaculture?
			2. What is carrying capacity?

**The carrying capacity is the number of organisms that any given environment can support.**

* + - 1. What is the difference between dependent & independent limiting factors? What are examples of each?
* **Density-Independent Limiting Factors: environmental factors that affect population growth regardless of population size (Ex: storms, changes in temperature, droughts, floods, pollution)**
* **Density-Dependent Limiting Factors: environmental factors that affect population growth as the population’s size increases (Ex: disease, parasite, lack of food)**
	+ - 1. What is the impact of a growing population on North Carolina’s natural resources?

**More natural resources are used since cars, houses, and roads increase. Land for agriculture, fresh water supplies, and clean air are also strained.**

* + - 1. What is an ecological footprint? What are **l**evels of ecological footprints?
			2. What contributes to your ecological footprint? Is it big or small? How can you make it smaller?

**List any fuzzy questions you have or, if you are do not understand a concept.**

**Others may have the same questions.**