Goal 2 Worksheet Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Bio.2.1 Analyze the interdependence of living organisms within their environments.**

**Bio.2.2 Understand the impact of human activities on the environment (one generation affects the next).**

1. Carbon Cycle
   1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** Absorbs Carbon
   2. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** Releases carbon
   3. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**Releases carbon
2. **Carbon Dioxide and Greenhouse Effect**
   1. As carbon dioxide levels go up, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Gases trap in the heat.
   3. Carbon dioxide levels are rising due to
      1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. **Greenhouse Effect**
   1. As temperatures go up, the following occurs
      1. More \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      2. More \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      3. Sea level rising which causes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      4. More \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Nitrogen Cycle
   1. All living things need\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Nitrogen is needed for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. Some places we have too much nitrogen and other places not enough.
   4. Plants can only intake nitrogen if it is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Plants such as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that fix nitrogen.
   6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ turn nitrogen into nitrates that a plant can use
   7. Hog Waste contains a lot of nitrogen which will runoff and cause many problems:
      1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lower the amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a lake and kill the fish.
      2. High nitrate levels in drinking water cause \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      3. High nitrate levels cause \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(a dinoflagellate) to become deadly and cause \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      4. NC is # \_\_\_\_\_\_\_\_\_\_\_\_\_ of hogs.
5. Energy Flow
   1. Living systems require a continuous input of energy to maintain \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. The input of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which is converted to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ allows organisms to carry out life processes.
   3. Within ecosystems energy flows from the radiant energy of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ through producers and consumers as chemical energy that is ultimately transformed into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. Continual refueling of radiant energy is required by ecosystems.
6. Food Chain
   1. Food chains show the one way transfer of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_in organisms.
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ break down the final matter at the end of the chain. Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_🡪\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. Producer or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Example” plants
   5. Consumer or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:
      1. Primary consumer: Eats \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: ex: rabbit
      2. Secondary Consumer: eats \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Ex: fox
7. Food Webs and Energy Pyramids
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:are interweaving food chains.
   2. Energy pyramids or\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:
      1. Show how energy is lost at each level.

Each organism gets only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:the energy from the organism before it

1. **Biological Magnification**
   1. As we move down a food chain, the amount of energy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. However, the amount of toxins or pesticides will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. Organisms at the top of the food chain will have the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. Over time these toxins will be stored in the fatty tissues of the organisms. This is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Relationships
   1. \_\_\_\_\_\_\_\_\_\_\_\_: When both organisms benefit.
      1. Example : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: When one organism benefits and the other organism is harmed: Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. **Population Growth**
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Limiting factors that control the size of the population. Examples: amount of food, water, and resources
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The maximum amount of organisms that the population can support.
   3. Exponential Growth: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. Logistic Growth: Stabilizes around the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_..
4. Human Population
   1. Population Size= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Exponential human population growth after \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. Death rate increased during \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. Death rate decreases due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. **Impact of disease on a population**
   1. AIDS: caused by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Influenza: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. Kills more people each year than AIDS
   3. Tuberculosis: caused by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. Has evolved to become antibiotic resistant
   4. Dutch Elm Disease\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on trees that is spread by a beetle.
      1. INTRODUCED TO NC FROM \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Protist that has 20+ life forms and can kill fish.
6. **Population Size and Resources**
   1. More people= more\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. More people = more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_= more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = more extinction
   3. More deforestation-> habitat\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. More people = more burning of fossil fuels for energy = more carbon dioxide= more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   5. Diversity is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
7. NC Ecosystems: Acid Rain
   1. Acid Rain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. Has a pH less than\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Main source of it in NC: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. Effects on Lakes: Kills \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. Effects on Trees: Acidic clouds, acid fog and acid rain are killing the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ecosystems.
8. **NC Ecosystems: NC Coasts**
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the wearing away of land or the removal of beach or dune sediments by wave action, tidal currents, wave currents or drainage.
   2. Beach erosion is increasing due to amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on the beach
   3. Prevent it by:
      1. Dune protection
      2. Sand bags
9. NC Ecosystems: Piedmont
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the Piedmont leading to habitat destruction and water runoff.
   2. Runoff contains \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. Fertilizers cause \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_🡪 fish kills
   4. Sediments cause rivers to be turbid and reduce amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the river.
   5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: All the land that drains into a body of water.
10. **NC Ecosystems**
    1. NC is #2 in country for amount of hogs
       1. Hog waste is stored in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on hog farms.
       2. Hog waste is high in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, bacteria, etc.
       3. Hog lagoons can occasionally spill over and runoff into streams and rivers.
       4. Nitrates from hog lagoons can leach into the groundwater and cause health effects.
       5. 3800 open-pit hog waste lagoons are contaminating the state's drinking water.
    2. Kudzu
       1. Kudzu as an invasive plant
       2. Kudzu was introduced to NC to help with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
       3. Like most exotic invasive species, it has taken over many ecosystems.
       4. Kudzu will cover \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
       5. Kudzu grows a foot per day and the roots can grow \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_..
       6. Scientists have not found an effective way to control kudzu.
11. **Protection of natural resources by humans**
    1. Explain the impact of humans on natural resources (e.g. resource depletion, deforestation, pesticide use and bioaccumulation )
    2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Used to kill weeds and insects. Often the chemicals will bio-accumulate in the top predators.
12. **Conservation and Stewardship**
    1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Helping to take care of the environment and our natural resources
    2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Methods to reduce the amount of water, energy, and other resources.
       1. Example: Turning off the lights or water when not in use.
13. **Adaptations: Respiration**
    1. Plants excrete water and gases through the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    2. Respiratory system in some animals: Removes carbon dioxide that is made in respiration and takes in oxygen.
       1. Lungs, bronchi, etc.
14. Adaptations: Transport and Excretion
    1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – how different organisms get what they need to cells; how they move waste from cells to organs of excretion.
    2. Organisms have to maintain balance in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    3. Organisms use\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to keep the pH neutral.
    4. Protists have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to control the amount of water.
    5. Excretion: Some animals have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which regulates water and salt amounts and removes waste.
15. **Circulatory/Respiratory Systems**
    1. Circulatory Systems
       1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Circulatory system: Blood flows through the animal’s body to each cell.
       2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Circulatory system: Blood flows through blood vessels
       3. Heart: Pumps blood
       4. Not all animals have one
          1. 2 chambered heart: fish
          2. 3 chambered heart: amphibian
          3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ chambered heart: mammals
16. **Adaptations: Transport**

|  |  |
| --- | --- |
| **Nonvascular Plants** | **Vascular Plants** |
| Ex: | Ex: |
| Uses \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and osmosis to transport nutrients and water to tissues. | Has\_\_\_\_\_\_\_\_\_\_\_\_ to move water up a plant |
| Needs to be near water. | Has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to move food down a plant |
| Have to be \_\_\_\_\_\_\_\_\_\_\_\_ in order to transport nutrients | Vascular system allows them to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Does not have true roots, stems and leaves. | Has true roots, stems, and leaves |

1. **Adaptations: Nutrition**
   1. Feeding adaptations
      1. Teeth
      2. Beaks: Some beaks are better at getting food than other.
      3. Filter feeders
   2. How organisms get nutrition
      1. Autotrophic: Make their food through photosynthesis or chemosynthesis.
      2. Heterotroph: Consumers, decomposers, detritivores
   3. How they break down and absorb foods.
   4. Some organisms have a digestive system.
2. Adaptations: Reproduction, Growth and Development

|  |  |
| --- | --- |
| **Sexual** | **Asexual** |
| \_\_\_\_\_\_\_\_\_\_\_\_\_ parents | \_\_\_\_\_parent |
| Has diversity | \_\_\_\_\_\_\_\_\_\_\_ diversity |
| Examples: eggs, seeds, etc | Examples: spores, budding, fission |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_: uses wind, bees, and animals | \_\_\_\_\_\_\_\_\_\_\_\_\_\_: Plant has anther and stigma |

1. **Reproduction in Vascular Plants**

|  |  |  |
| --- | --- | --- |
| **Spore bearing plants** | **Gymnosperms** | **Angiosperms** |
| Have to live near water | Seed bearing: seed in \_\_\_\_\_\_ | Seed bearing: seed in fruit |
| Releases \_\_\_\_\_\_\_which are diploid |  | Releases \_\_\_\_\_\_\_\_\_\_(sperm) to fertilize egg |
| Small and needs to be near water | Needle like leaves | Has \_\_\_\_\_\_to attract bees to pollinates |
| Ex: ferns | Ex: pines | Ex. Maple tree |

* 1. Fertilization
     1. **Egg +sperm= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
     2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Mainly done by mammals and birds
     3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Male releases 1000 of sperm. Female releases 1000 of eggs and some will join. Example: Fish reproduce this way

1. Behavior
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Structure: Some insects have queens, kings, and workers
   2. Communication:
      * Sounds: bird songs
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: chemical messages : used by ants and termites.
      * Body language: Ex: Waggle dance of the honey bees tells where the food is.
   * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : The process used to find a mate such as dances, gifts, songs, etc

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : Animals use many methods to protect a territory.

* + (Example: fighting fish).

1. Innate Behavior
   1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** Holing up to avoid the heat.
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Holing up to avoid the cold
   3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Response to a stimuli
      1. Phototaxis: response to \_\_\_\_\_\_\_\_\_\_\_\_\_
   4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Moving to a new home to escape climatic conditions or to find a food source.
2. Learned Behavior
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: an animal learns to perform a behavior more and more skillfully by repeating behaviors that result in rewards and avoiding behaviors that result in punishment
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Training a reflex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ trained his dogs to salivate when he rung a bell.
   3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: decrease in response to a stimuli because you are used to it