**Human Activity Affecting the Earth**

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**Overarching Question:** How does human activity (farming, mining, building) affect the land and ocean in positive and/or negative ways?



What part of the earth can human activity affect?

What kind of human activity affects the earth?

Does human activity positively or negatively affect the earth?

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**Overarching Question:** How does human activity (farming, mining, building) affect the land and ocean in positive and/or negative ways?

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| **Line of Evidence - Biomes** |
| *There are 5 main biomes in the world that can be affected by human activity: Desert, Aquatic, Forest, Grasslands, and Tundra.* |

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| **Line of Evidence –Human Activity and Biome Stations** |
| *It is easy for human activity to negatively affect the earth. In the mining biome station, we saw how removing chunks of mountains to extract minerals damages the land. In the ocean biome station, we saw how oil spilled in the ocean is extremely hard to clean up and can be harmful to the living creatures inside of the ocean.* |

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| **Line of Evidence - Human Activities Article** |
| *Land use practices in farming, construction and development, and mining affect land soil tremendously. In each practice, soil is dispersed and manipulated to benefit the practice. Soil is often lost or dispersed to bodies of water.* |

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| **Line of Evidence – Toxtown Interactive Website** |
| *There are all kinds of human activity that can affect the land and ocean of the earth. Specific forms of human activity that we studied are occupations, such as a farmer, miner, builder, or fisherman/woman. The occupations in the town present good and bad things for the town. For example, when the builders do construction in the city, they can release harmful dust particles and chemicals.* |

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| **Big Aha Thesis Statement** |
| *Human activity manipulates the land and ocean to meet the needs of occupations. Due to several occupations in need of earth’s resources, there are a lot of negative affects that occur. Humans must be responsible with how they use the land and ocean.* |

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| **ENGAGE- Biomes**  **TN State Standard Fourth Grade:** Create an argument, using evidence from research, that human activity (farming, mining, building) can affect the land and ocean in positive and/or negative ways.  1. Turn and talk to your partner about the question: “How do you think humans impact our earth?” Be prepared to share with the class your thoughts.  2. Lets review the topic of our world’s biomes. As we discuss in class, list the 5 main biomes and a short description of each below:  3.Watch the video, “Human Impact on the Environment.” <https://www.youtube.com/watch?v=0zPcR7wgh0c>. Describe your thoughts on the images and message portrayed in the video below: |

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| **ENGAGE- Biomes**  **TN State Standard Fourth Grade:** Create an argument, using evidence from research, that human activity (farming, mining, building) can affect the land and ocean in positive and/or negative ways.  1. Turn and talk to your partner about the question: “How do you think humans impact our earth?” Be prepared to share with the class your thoughts.  2. Lets review the topic of our world’s biomes. As we discuss in class, list the 5 main biomes and a short description of each below:    3.Watch the video, “Human Impact on the Environment.” <https://www.youtube.com/watch?v=0zPcR7wgh0c>. Describe your thoughts on the images and message portrayed in the video below: |

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| **EXPLORE- Human Activity and Biome Stations**  Oil on the Ocean. (n.d.). Retrieved March 21, 2017, from <https://www.teachengineering.org/activities/view/cub_enveng_lesson01_activity2>  Blonigen, J., Perales, G., & Stroman, K. (2015, December 2). Environmental Impact Lesson Plan [.DOC].  1. You will be assigned an occupation (farmer, miner, builder, or fisherman/woman) that has an affect on the earth. Once you get your assigned occupation, form into groups with peers who share the same occupation.  2. With your group, research the logistics of your occupation and how it affects the earth. You will have 15 minutes to research. List your findings below:  3. Now that you have a good understanding of your occupation and how it can affect the earth, lets explore some activities to find out if your occupation positivity or negatively affects the earth. Your occupational group will rotate every 10 minutes to explore various biomes and analyze the changes to the biomes caused by human activity.  **Ocean Biome Oil Spill Station:**  *Materials:*   * 1 plastic bin (shoebox size or similar) * 2 cups (473 ml) sand * 1/4 cup (~60 ml) toasted sesame or other dark-colored oil * Water * Paper towels for cleanup * Liquid dishwashing detergent   *Procedure:*  1. In a bin, create a beach by filling one-quarter to one-half of one side of the bin with sand; then fill the bin with 2 or 3 inches of water.  2. After the “ocean” bins are created, pour 2 or 3 tablespoons of oil on the water. This is what happens when oil is spilled into our oceans. Drop a few drops of dish soap or dispersant on the water.  3. See how the oil reaches the beach (sand section in the bin) with nothing to stop it. Observe the oil creep toward the sand.  4. Answer the questions below and move on:   * What biome are you observing? * Does your occupation interact with this biome? If so, how does it leave an impact? * Is the activity presented leaving a positive or negative impact on the biome? How so? * If it is impacted the biome negatively, how could you help prevent it from happening?   **Forest Biome Cookie Coal Mining Station:**  *Materials:*  1 chocolate chip cookie per student  1 paper clip per student  2-3 toothpicks per student  1 small paper plate per student  1 sheet of graph paper per student  *Instructions:*1. Begin by taking your sheet of graph paper and placing it under your cookie. In the “Pre Mining” square, trace around your cookie  2. After removing the cookie, shade in the squares that represent chocolate chips, or coal deposits, that you observe.  3. Count the number of total squares in your “Pre Mining Land Area” and write somewhere in the box.  4. Now, look at a side view of the cookie and draw this side view on the graph paper in the second “Pre Mining Land Area” box.  5. Now, move the cookie to the plate. You may no longer touch the cookie with your hands, only the tools.  6. Using only the tools provided, extract the coal from the cookie in the best way you possibly can. Remember, that you want to limit the damage whenever possible.  7. Set aside the coal pieces as you mine them. Remember, you want to limit the damage whenever possible, as you must reclaim the land.  8. Count your coal pieces.  9. After counting the coal, transfer your ‘earth’ (the remaining cookie) to your graph paper and try to put the earth back together the way it was originally. You may not use your hands for this, just the tools provided.  10. Once you have reclaimed the earth as best you can, trace around it. Count the squares and write next to your drawing.  11. Now look at the ‘earth’ from a side angle, and draw the topography of your earth in the second Post Mining Area square on your graph paper.  12. Answer the questions below and move on:   * What biome are you observing? * Does your occupation interact with this biome? If so, how does it leave an impact? * Is the activity presented leaving a positive or negative impact on the biome? How so? * If it is impacted the biome negatively, how could you help prevent it from happening? * If it is impacted the biome negatively, how could you help prevent it from happening?   **Rainforest Station:**  *Materials:*   * Computers   *Instructions:*  1. Explore the following website: <http://www.ri.net/schools/West_Warwick/manateeproject/Rainforest2/interesting.htm>  2. Answer the following questions and move on:   * What biome are you observing? * Does your occupation interact with this biome? If so, how does it leave an impact? * Is the activity presented leaving a positive or negative impact on the biome? How so? * If it is impacted the biome negatively, how could you help prevent it from happening? |

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**Human Activity and Biomes CER**

**Claim** (Write a sentence describing a type of human activity that either positively or negatively affects the land).

**Evidence** (Provide data from the biome stations to support your claim of human activity that positively or negatively affects the earth.)

**Reasoning** (Explain how your evidence supports your claim. Describe the affects that the human activity has on the earth).

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**ANSWER KEY Human Activity and Biomes CER**

**Claim** (Write a sentence describing a type of human activity that either positively or negatively affects the land)

*Students can choose from any of the biome stations to support their answer. Here is one for the mining station: Surface Mining, a type of human activity that removes big parts of the earth to extract minerals, negatively affects the land by removing parts of mountains that cannot be placed back together.*

**Evidence** (Provide data from the biome stations to support your claim of human activity that positively or negatively affects the earth.)

*As we took the chocolate chip cookies (aka coal) from the cookie (aka land), we could see how a real mountain can be negatively affected. The chocolate chips were hard to extract from the mountain. The rest of the cookie (land) was broken up and scattered across the plate. Trying to put the cookie back together without the chocolate chip cookies was difficult and majorly damaged the cookie.*

**Reasoning** (Explain how your evidence supports your claim. Describe the affects that the human activity has on the earth)

*The fact that the cookie (land) was so messed up after we extracted the chocolate chips (coal) just shows how much damage surface mining can have on real mountains. We were not able to get a lot of the coal out in whole pieces with just a few of the tools that we had (toothpicks and paperclips). After this activity, I can make the argument that coal mining, a type of human activity, damages land significantly.*

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**EXPLAIN– Human Activities Article**

Human Activities Affect Soil . (n.d.). Retrieved April 23, 2017, from <http://www.classzone.com/science_book/mls_grade7_FL/248_252.pdf>

(Article is attached to notebook)



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**Notes Page**

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| Types of Human Activity That  Affect Lands and Oceans | Farming  Mining  Building |
| What is Recycling? | The process of turning waste into reusable material. |
| Types of Soil Conservation | Terraces  Windbreaks  Crop Rotation |
| Why is soil a necessary resource? | Soil helps sustain life on earth. It provides an environment for plants to grow and helps purify water. |
| What is pollution? | Any contamination of air, soil, water and environment. |
| Types of Pollution | Air  Water  Land  Noise |

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**Human Activities Article Questions**

Human Activities Affect Soil . (n.d.). Retrieved April 23, 2017, from http://www.classzone.com/science\_book/mls\_grade7\_FL/248\_252.pdf

1. Describe at least three methods of soil conservation.
2. What is pollution? And what are the different types?
3. Why is soil a necessary resource?
4. How do land-use practices in farming, construction and development, and mining affect soil?
5. Choose a form of mining and create an argument to explain why it negatively affects land.

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**ANSWER KEY Article Reading Questions**

1. Describe at least three methods of soil conservation/***Terraces:*** *flat, step like areas built on a hillside to hold*

*rainwater and prevent it from running downhill. Crops are planted on the flat tops of the terraces.* ***Windbreaks****: rows of trees planted between fields to “break,” or reduce, the force of winds that can carry off soil.* ***Crop rotation****: the practice of planting different crops on the same field in different years or growing seasons.*

1. What is pollution? And what are the different types?

*Any contamination of air, soil, water and environment. Types are air, water, land, and noise pollution.*

1. Why is soil a necessary resource?

*Soil helps sustain life on earth. It provides an environment for plants to grow and helps purify water.*

1. How do land-use practices in farming, construction and development, and mining affect soil?

*Land use practices in farming, construction and development, and mining affect soil tremendously. In each practice, soil is dispersed and manipulated to benefit the practice. Soil is often lost or dispersed to bodies of water.*

1. Choose a form of mining and create an argument to explain why it negatively affects land.

*Surface mining completely takes off the tops of mountains and removes any plant and soil life from the surface of the ground. This destroys any life to grow from the soil on the top of the mountain.* **ANSWER KEY Article Reading Questions**

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| **ELABORATE- Toxtown Interactive Website**  Tox Town - City - Urban environmental health concerns, illustrated. (n.d.). Retrieved April 23, 2017, from <https://www.toxtown.nlm.nih.gov/scenes/city/scene.php>  1. Find a partner with the same assigned occupation as you and go to a computer. Type in the URL: <https://www.toxtown.nlm.nih.gov/scenes/city/scene.php>  2. You will be directed to ToxTown – an interactive website that allows you to explore human activity and environmental impact. Keep in mind how your specific occupation interacts with Toxtown and the environment. Is it positively or negatively affecting the town?  4. Record 5 examples (both positive and negative) of environmental impact in Toxtown below: |
| **ELABORATE- Toxtown Interactive Website**  Tox Town - City - Urban environmental health concerns, illustrated. (n.d.). Retrieved April 23, 2017, from <https://www.toxtown.nlm.nih.gov/scenes/city/scene.php>  1. Find a partner with the same assigned occupation as you and go to a computer. Type in the URL: <https://www.toxtown.nlm.nih.gov/scenes/city/scene.php>  2. You will be directed to ToxTown – an interactive website that allows you to explore human activity and environmental impact. Keep in mind how your specific occupation interacts with Toxtown and the environment. Is it positively or negatively affecting the town?  4. Record 5 examples (both positive and negative) of environmental impact in Toxtown below: | |

**Toxtown Interactive Website CER**

**Claim** (Write a sentence stating if your occupation positively or negatively affects the environment in Toxtown.)

**Evidence** (Provide evidence from the interactive website to support your claim. Cite some of the positives/negatives correlated with your occupation on the website.)

**Reasoning** (Explain how your evidence supports your claim. Describe how your occupation affects the environment positively and negatively.)

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**ANSWER KEY Toxtown Interactive Website CER**

**Claim** (Write a sentence stating if your occupation positively or negatively affects the environment in Toxtown.)

*Answer varies according to student. But should include one of these occupations: farmer, miner, builder, fisherman/woman.*

**Evidence** (Provide evidence from the interactive website to support your claim. Cite some of the positives/negatives correlated with your occupation on the website.)

*Answer varies according to student. In each of the areas of the town, there are links students can click on to explain the advantages and disadvantages of the occupations. Students should list at least one of the examples given on the website.*

**Reasoning** (Explain how your evidence supports your claim. Describe how your occupation affects the environment positively and negatively.)

*Students should display a clear understanding of the link between the occupation and whether or not it positively/negatively affects the environment.*

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**Evaluate Questions**

1. What part of the earth can human activity affect?
2. Name three forms of human activity that could affect the land and ocean.

*.*

1. List three positive or negative affects of human activity on the earth.

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**Evaluate Answers**

1. What part of the earth can human activity affect?

*All parts of the earth can be affected by human activity. The five main biomes that can be affected are Desert, Aquatic, Forest, Grasslands, and Tundra.*

2. Name three forms of human activity that could affect the land and ocean.

*Mining, building, and fishing.*

3. List three positive or negative affects of human activity on the earth.

*Various answers to this question, but here are three examples:*

* *When builders do construction in the city, they can release harmful dust particles and chemicals.*
* *Farmers use barns, silos, sheds, and other farm buildings to story feed, manure, animal bedding, etc. Problems can arise when hay gets when and grows mold, which releases chemicals not good to breathe.*

- *When fishermen/women fish, there are often times hazardous materials dropped into the ocean, such as oil spills and plastic. The oil is hard to clean up and the plastic is harmful for animals to consume.*

**Evaluate Answers**

1. What part of the earth can human activity affect?

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**Big Ah-Ha Thesis**

The purpose of this unit was to understand how human activity, especially farming, mining, building, etc., affects the land and ocean in positive and/or negative ways. To gain understanding on this topic, we watched the video, “Human Impact on the Environment,” researched occupations that function on human activity, completed the human activity and biome stations, read an article on human activity affecting the land, and explored the Toxtown interactive website.

Biomes are the main parts of the earth that can be affected by human activity. After watching the video displaying the different biomes, we visited stations that represent various biomes and how they can be affected by human activity. The ocean biome was affected by an oil spill, the forest biome was affected because of mining, and the rainforest was affected from millions of trees being chopped down.

We continued on to read an article highlighting in detail human acidity with land/soil. We read why soil is so important to life on earth because it provides an environment for plants to grow and purify water; however, because of human activity, such as mining, soil is being damaged and put to waste. We learned methods of conserving the soil, such as terraces, wind breaks, and crop rotation.

Moving on, we explored the interactive online community of Toxtown, which displayed numerous forms of human activity that affect the earth. We got to find our occupations and read the positives/negatives that come from them.

Each of our learning activities was a line of evidence. They helped us create our conclusion on the positive/negative affects of human activity on the earth.

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We continued on to read an article highlighting in detail human acidity with land/soil. We read why soil is so important to life on earth because it provides an environment for plants to grow and purify water; however, because of human activity, such as mining, soil is being damaged and put to waste. We learned methods of conserving the soil, such as terraces, wind breaks, and crop rotation.

Moving on, we explored the interactive online community of Toxtown, which displayed numerous forms of human activity that affect the earth. We got to find our occupations and read the positives/negatives that come from them.

Each of our learning activities was a line of evidence. They helped us create our conclusion on the positive/negative affects of human activity on the earth.