

Consequences of Human and Environmental Interaction: A GIS Mapping Lesson

Grades 9

A WV Social Studies Lesson Plan



Lesson Essential Question	Notes:
How can we use data to map and analyze the consequences of human and environmental interaction using geographical information systems?	
Lesson Objectives (“I Can...” Statements)	
<ul style="list-style-type: none"> ● I can correlate a consequence between an interaction between humans and the environment. ● I can map data using ArcGIS to further analyze consequences of human and environmental interactions. ● I can conclude potential consequences of human and environmental interactions based on past events, data, and personal experience. ● I can illustrate data using creative means to support my hypothesis. 	
Lesson Standards	
SS.C.43: Analyze the consequences of human and environmental interaction using geographic information systems.	
Prior Knowledge/Prerequisite Skills	
<i>Prior to this lesson, students should be familiar with geographic information systems concepts and vocabulary. Students should be comfortable with reading and creating basic maps in order to analyze data presented.</i>	
Lesson Vocabulary	
<ul style="list-style-type: none"> ● GIS (Geographic Information Systems) ● Hypothesis ● Human and Environmental Interaction 	
Materials and Resources	
<p>Materials Needed:</p> <ul style="list-style-type: none"> ● Paper and pencils ● Lesson Activity Worksheet (attached) ● Student access to WVStudentmaps (http://wvstudentmaps.maps.arcgis.com/) <p>Resources:</p> <ul style="list-style-type: none"> ● What is GIS? https://www.esri.com/en-us/what-is-gis/overview ● WVDE GIS Resources https://wvde.us/middle-secondary-learning/gis/ ● GIS Maps (Static) of WV https://www.mapwv.gov/staticMaps.html ● GIS Maps (Interactive) of WV https://www.mapwv.gov/interactiveMaps.html 	
Accommodations	
<ul style="list-style-type: none"> ● Strategically group students ● Provide a pre-filled template map ● Modify activity worksheet to reduce number of open-ended responses (pre-fill with specific questions) and provide a list of resources for research ● Assign hypotheses to students rather than having students develop their own 	

Consequences of Human and Environmental Interaction:

A GIS Mapping Lesson

Grades 9

A WV Social Studies Lesson Plan



- Adjust timing and pacing of lesson and activity to best meet the needs of students

Learning Procedures

1. Activating Strategy: Storyboard

- Display the lesson essential question so that all students can see it. Instruct students to fold their paper in half. Once papers are folded in half, instruct students to illustrate an example or a prediction that answers the lesson essential question. One side of their paper should depict human interaction with the environment and the other side of the paper should depict the consequence(s) of the interaction. Illustrations do not have to be detailed, a rough sketch is likely preferable for the sake of time. (5 - 10 minutes)
 - Once all students have completed their illustration, split students into collaborative pairs and have them discuss their drawings together. Allow a few volunteers to share with the class to transition into the lesson. (5 minutes)
- Using a GIS map of your choice, introduce students to the lesson by analyzing a familiar or local human interaction with the environment in your area or region. (5 minutes)
 - Allow students to view the map and help them analyze the data shown as needed. Review mapping concepts and vocabulary as needed (i.e. scale, legend, cardinal directions, etc.)
 - Example: Use www.wvgs.wvnet.edu/GIS/CBMP/all_mining.html to investigate the underground and surface coal mines in your area. Once data has been identified, ask students to reflect on how they think mining activities have impacted the local environment. Allow student volunteers to answer and then model the researching process to find the answer(s).
 - Divide students into small groups or pairs and provide them with the lesson activity. (30 minutes)
 - Students work together to investigate human interaction and environmental consequence(s) supported by data to create their own GIS map. These interactions and regions can be assigned by the teacher or self-selected by students.
 - The activity could also be restricted to West Virginia's boundaries or expanded to the national and/or international level.
 - After students have completed their worksheet, repeat the Storyboard activity from the beginning of the lesson.
 - This time, students should illustrate the human interaction and environmental consequence(s) that they investigated with their peer(s) with detail and include data sources.

Outcome & Assessment Strategies

Outcome:

Students will identify consequences of human and environmental interaction using geographical information systems in order to create their own data map using ArcGIS.

Assessment Strategies:

- Storyboard: Students provide a written/illustrated response demonstrating current comprehension and knowledge of the topic at hand.
- Student ArcGIS Maps: Students integrate research and geographic information systems to illustrate understanding of the lesson essential question.

Names:

Date:

Class:

CONSEQUENCES OF HUMAN AND ENVIRONMENTAL INTERACTION

DIRECTIONS:

1. State your hypothesis.
2. Research various sources to find data that either proves or disproves your claim and record it on this worksheet.
3. Use <http://wvstudentmaps.maps.arcgis.com/> to create an ArcGIS web map that illustrates the consequence(s) between human interaction and the environment that you discovered.

HYPOTHESIS (What do you PROPOSE is a consequence of human and the environmental interaction?)

EVIDENCE (Prove or disprove your claim with DATA collected through research)

1. _____

(Source: _____)
2. _____

(Source: _____)
3. _____

(Source: _____)
4. _____

(Source: _____)
5. _____

(Source: _____)

FINAL CONCLUSION (What did your research prove or disprove about your hypothesis?)

BONUS: Create a new storyboard that illustrates your analysis of the consequences that human and environmental interaction based on data gathered from GIS. Be sure to reference your source(s) somewhere on your storyboard.