

Geographic Information Systems: Introduction and Map Creation

Objectives:

Describe Geographic Information Systems and how they impact our world

Define terminology used to make maps with ArcGIS

Use ArcGIS software to create a web map that answers a research question

Write a reflection about the process and present findings

Target Grade Level: Gifted and Talented students, Grades 6 and 7

Target Subject: Computer Science, Social Studies

Notes for Educators: Students should be familiar with chromebooks and map features. Having more than one adult in the room will be very beneficial for trouble-shooting and differentiation. Educators should create multiple maps and make note of obstacles before implementing the lesson. ArcGIS provides free educational licenses upon request.

Materials:

Chromebooks, ArcGIS software, ArcGIS Newsletters

*Resources document in progress

PRE-TEST

What is GIS?

What is a Geographic Information System?

How does GIS impact our world?

How can GIS be used to solve problems?

How can GIS affect decision making?

Within ArcGIS:

What is a layer?

What is a feature?

What is symbology?.

(Not finished)

CATCH/HOOK

Work independently or with a partner to draw a mental map of our school. Participate in a gallery walk to view maps of student volunteers.

Optional or at a later date: GPS mapping activity outside of the classroom with GIS Analyst from City of Casper

ACTIVITY INSTRUCTIONS

[Introduction to GIS - Video by ESRI](#)

Present GIS introduction slides (direct instruction)

Present maps that change the world website and discuss impacts

Provide 10-15 minutes to explore ArcGIS, student gallery and/or ESRI newsletters

Think Pair Share - Discuss impacts, problem-solving and decision-making (note-taking optional)

Guided tour of ArcGIS including layers, features, symbols etc. with a printed guide with definitions

Lead students through a geoinquiry about American Indian lands in the United States

Analyze the American Indian lands map and identify map elements in small groups

Discuss the research question from the geoinquiry and make map/data observations

ArcGIS: Students analyze base maps and layers and develop research questions

Students create a web map designed to answer their research question(s)

Present maps

Take post-test

Write a reflection

REVIEW

Access to slideshow

Partner quizzing of vocabulary terms

Peer review and feedback for maps before the presentation

POST-TEST

See pre-test questions

Description of GIS and impacts

Evaluation of student maps with a rubric

ELA grade for the written reflection

STANDARDS

CROSS-DISCIPLINARY

SS6.2 Students will apply fundamental geographical skills and knowledge to analyze physical and political maps.

SS6.4.1 Identify the location of past and present tribes in Wyoming (e.g. location of reservations, tribes, historical monuments).

SS7.1.2 Review the different types of maps, including political, physical, and thematic maps, and their uses to understand the world.

ELA7.1 Students will present claims and findings through a range of collaborative discussions and/or individual presentations to demonstrate the rules of effective communication.

ELA7.11.6 Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

COMPUTER SCIENCE

Domains:

Data and Analysis, Impacts of Computing

Specific CS Standards:

8.IC.C.01

Impacts of Computing

Identify how computing technologies are used in various careers.

Describe impacts associated with computing technologies that affect people's everyday activities and career options.

8.DA.CVT.01

Data and Analysis

Define and use computational tools

Using computational tools, transform collected data to make it more useful and reliable.