COOL CARTOGRAPHY

Explore the skill, care, and sometimes humor that go into creating a map. Students will create their own map of a "country" and make it a work of art.

Kansas College and Career Ready Standards for Social Studies/Geography:

- Standard 3 Societies are shaped by beliefs, ideas, and diversity.

Kansas College and Career Ready Standards for Visual Arts:

- VA: Cr1.1.3 Elaborate on an imaginative idea.
- VA: Cr2.1.3 Individually or collaboratively construct representations, diagrams, or maps of places that are a part of everyday life.
- VA: Cr3,1,3 Elaborate visual information by adding details in an artwork to enhance emerging meaning.

Classroom teacher should provide:

- 9"x12" white construction paper – one per student
- Crayons, colored pencils or markers – student's choice
- Pencils
- Rulers
- Landforms and Definitions pages for each student
- Optional – a variety of different kinds of maps as examples for students to view. They can be road maps, political, physical, topographic, etc. World maps, country or city maps will work fine.

Program Connection Information

Please use an external microphone (conference style) rather than the integrated one in the computer for the audio for your class and locate it centrally in the room. It can be difficult for the Greenbush teacher to hear the students using the computer microphone and therefore it reduces the interactive nature of the lesson. It is fine to use the computer webcam for your video source.

All classes will take place using Zoom desktop video. If your building is already set up to use a desktop video application with a computer, simply open a browser and enter https://zoom.us/j/3662120241 in the URL space. You may need to download Zoom launcher software (free download) if you don't already have it. This needs to be done in advance of the lesson.

If using a Polycom video conferencing unit (or any legacy type video conferencing unit) to connect to a ZOOM conference, make sure the unit is in "encrypted mode" then dial the following IP on the internet: 162.255.37.11 or 162.255.36.11 and once connected, they will ask for a MEETING ID: enter 3662120241 (for Sharon at Science Center).

It's always a good idea to touch base with your district technology facilitator prior to your program to make sure all systems/equipment are in place and operational and that there aren't any firewalls in place that might prevent you from connecting to Zoom.

Once you connect, you will enter a Zoom waiting room. Your Greenbush teacher will admit you into the final meeting room.

If you have questions, please call Sharon Bertolio at Greenbush, 620-724-6281, or email at sharon.bertolio@greenbush.org (best method of contact).

Landforms and Descriptions

Bay	Part of a body of salt water that reaches into the land; usually smaller than a gulf.
Beach	A coastal landform consisting of deposits of sediments that run parallel to the shore.
Canyon	A narrow valley with steep sides; usually created by erosion.
Cave	A large hole in the ground or in the side of a hill or mountain.
Cliffs	Steep faces of rock and soil.
Coast	Land along the sea or ocean.
Continent	A very large land mass.
Dam	A wall built across a stream or river to hold back water.
Desert	An area with very little rainfall or vegetation.
Forest	A large area of land covered with trees and underbrush; big wooded area.
Geyser	A natural hot spring that occasionally sprays water and steam above the ground.
Glacier	A huge mass of ice slowly flowing over a landmass.
Gulf	A large area of a sea or ocean partially enclosed by land.
Harbor	A sheltered part of a body of water deep enough to provide a place for ships to anchor.
Iceberg	A large floating piece of ice that has broken away from an ice shelf or a glacier.
Island	A piece of land completely surrounded by water.
Lake	A large inland body of fresh water or salt water.
Marsh	An area of soft, wet, low lying land, with grassy plants, often forming a transition zone between water and land.

Mountain	A high, rocky land, usually with steep sides and a pointed or rounded top, higher than a hill.
Ocean	The largest body of salt water; they cover 3/4 of the earth's surface.
Peninsula	A piece of land that extends into a body of water and is surrounded on three sides by water.
Plains	Broad, flat or gently rolling areas; usually low in elevation.
Prairie	A large area of flat or rolling, mostly treeless grassland.
Reservoir	A man-made lake that is primarily used for storing water.
River	A large natural stream of water emptying into an ocean, lake or other body of water.
Sea	A large body of water, usually salt water, partly or completely surrounded by land.
Swamp	An area of land that is always soaked with water; low, wet land that supports grass and trees.
Valley	A long lowland between ranges of mountains, hills or other uplands, often having a river or stream running along the bottom.
Volcano	A mountain-like vent in the Earth's crust. When a volcano erupts, it spews out lava, ashes, and hot gases from deep inside the Earth.
Waterfall	A place where running water makes a sheer drop, usually over a cliff.

Additional Lesson Resources

A great resource to consider is from KidsGeo.com

https://kidsgeo.com/geography-for-kids/types-of-maps/

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Classes take place at the following times:

9:00-9:45
10:00, 10:45
12:15- 1:00
1:15-2:00
2:15-3:00

If you log in during one of those times, you may connect during another class' lesson. If you do, please check your connection to make sure things are working properly and then leave the meeting until your scheduled time by selecting "End Meeting" in the lower right corner of your Zoom screen and click on "End Meeting". You will need to rejoin the meeting at your scheduled time. This prevents your site from interfering with the lesson currently in progress. After your lesson is finished, please leave the meeting.

If you have questions, please call Sharon Bertolio at Greenbush (620-724-6281).

Prior to the IDL lesson, please pre-teach and practice these cooperative learning techniques with your students. These will be used in the IDL lessons this school year.

Round Robin

Each member of the team takes a turn sharing orally with the team.

Rally Robin

With a partner, students take turns sharing brief oral responses.

Timed Pair Share

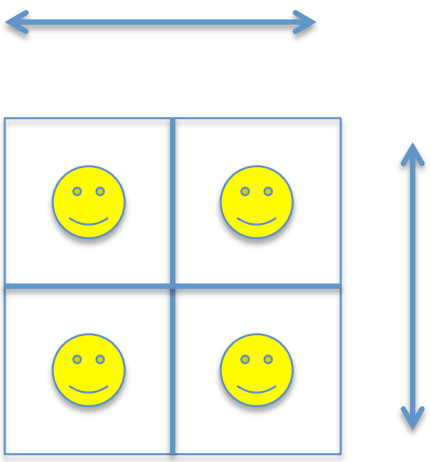
In pairs, students share with a partner for a predetermined time while the partner listens. Then partners switch roles.

Stand Up, Hand Up, Pair Up

Students move around with hands in the air and quickly find a partner with whom to share or discuss. Once students find a partner, they give each other a "high five" and stand together, ready for the next instructions.

More terms to know –

Shoulder Partner:
The person sitting on the student's right or left.



Face Partner:
The person sitting facing the student.

Additional Lesson Resources

A LATITUDE/LONGITUDE PUZZLE

How can lat/long clues, as well as what we learn about the culture and environment of different places, help us to solve a map puzzle?

OVERVIEW

Students use latitude, longitude, and research on characteristics of different states and regions to solve a puzzle.

For the complete activity with media resources, visit: http://www.nationalgeographic.org/activity/latitudelongitude-puzzle/

DIRECTIONS

1. Review latitude and longitude.

Remind students that cartographers long ago created a system of imaginary gridlines for the whole globe. The grid lines are called latitude and longitude. They are measured in degrees.

Project the Lines of Latitude diagram and invite a volunteer to point out the Equator. Ask: ***What's the number next to this line?*** (0 degrees) Explain that locations along this line all the way around the globe are at 0 degrees latitude. Lines of latitude measure the distance north or south of the Equator. Point out the lines to the north, labeled with an "N." Ask: ***Which of these lines of latitude do you think are in the northern hemisphere? Which are in the southern hemisphere? How do you know?*** Have volunteers come to the board and explain.

Project the Lines of Longitude diagram. Ask students to name the location of the prime meridian (0 degrees). The lines of longitude show locations to the east or west of the prime meridian.

2. Name locations on a map of the United States.

Next, give each student a printed copy of the MapMaker 1-Page Map of the United States. Ask: ***Which lines are lines of latitude? Which are lines of longitude?***

Have students find New Orleans, Louisiana on their maps. Ask: ***How could we name the location of this city using*** lat/long***—short for latitude and longitude?*** Have students move a finger along the lines at the point of the city to the margins and explain that it is at 30 degrees N latitude and 90 degrees W longitude. This pair of numbers is called the location's coordinates. Explain that some sites will not be so close to lines of latitude or longitude, so we estimate based on distance to the lines. For example, Denver, Colorado, is at 40 degrees N, 105 degrees W. The longitude measurement is about halfway between 100 and 110 degrees W.

Ask: ***For what other places can we name the location using lat/long on this map?*** Give students an opportunity to work in pairs to select 2-3 sites and identify the lat/long for them. Tell students to set the map of the United States aside—they will use it again later.

3. Have students practice using latitude and longitude.

Give each student a copy of the worksheet Earth's Grid System. Point out to students that the locations of latitude and longitude on the worksheet map are the same for any map or globe. Have them find Albuquerque, New Mexico on the worksheet. Ask:

- *Along what line of latitude is Albuquerque?* (35 degrees N)
- *Which two lines of longitude is it between?* (105 degrees W and 110 degrees W)
- *What degree longitude do you think it is, between 105 and 110?* (It's in the middle but closer to 105, so about 107 degrees W.)

Next, look at the MapMaker Interactive together as a class, and zoom in to find Albuquerque. Change the units of measure to decimals at bottom left. Put the cursor on Albuquerque and show students the lat/long measurement at the bottom left. Ask: *Is it close to 35 degrees N, 107 degrees W?* Explain that information on maps that we use on computers and global positioning systems (GPS) is all organized by lat/long. Depending on students' math level, have them round the decimals to whole numbers or use the decimals.

Have students complete the worksheet Earth's Grid System to practice finding locations using lat/long measurements. Check for understanding by reviewing the answers together as a class.

4. Have students apply their learning to a lat/long puzzle.

Explain that students will be using lat/long and some clues to solve a puzzle. Give each student a copy of the handout A Summer Day and have them retrieve the map of the United States from Step 2. Have students work independently to read the passage and follow the directions. Provide access to atlases and

geography links such as 50states.com for students' research.

When students have identified the coordinates, completed their research, and identified the state they think is described in the passage, regroup as a whole class. First, focus on the coordinates that do not match the place characteristics in the paragraphs. Ask students for their ideas.

- A: Arizona—Students may respond that maple and oak trees are not common in Arizona.
- B: Montana—Students may respond that corn is not common in Montana.
- D: Florida—Students may respond that the air would probably not be cool in summer in south Florida, and there would be little need to stack firewood.

Both physical and cultural characteristics of Wisconsin fit the description. Explain that it is important to know where places are, but also to understand what those places are like. Have students complete the rest of the worksheet.

5. Have students create a puzzle with clues using a world map.

As a homework assignment, have students use the provided MapMaker 1-Page Map of the world or another map showing lat/long to create a similar puzzle. Have students identify three locations and write coordinates for each. Then have them use atlases and other resources to create three clues that describe one of those locations. Collect and check the puzzles for accuracy and understanding. Have them exchange their puzzles for additional practice with lat/long and characteristics of different places.

Tip

Point out that lines of latitude and longitude do not actually exist as lines drawn on Earth. They are imaginary lines used to communicate the exact location of

places on Earth.

Tip

Provide several world maps and globes for students to study in groups of two or three. Have them look for lines of latitude and longitude, the prime meridian, and the Equator.

Informal Assessment

Check students' A Summer Day worksheets and the quizzes they create for the world map for understanding.

Extending the Learning

- Have students research the history of latitude and longitude as it was used by explorers. The means for measuring latitude was created much earlier, while longitude was much more difficult to measure. This difficulty resulted in many errors in early maps and explorations. Have students create a timeline of advances in measuring latitude and longitude, including 20th century advances in geo-technologies, using websites such as the PBS NOVA Teacher site or The Galileo Project site.

- Have students explore the content on The Degree Confluence Project and look for places where people have used a GPS to find whole number coordinates in their state or a state or country of interest. Discuss the purpose of this project "to create an organized sampling of the world." Have students find ten sites of interest, mark them on a state, country, or world map, and include a description of the places. Post these on a bulletin board for others to see the project.

OBJECTIVES

Subjects & Disciplines

Geography

- Cartography

Learning Objectives

Students will:

- identify locations on a map using latitude and longitude
- compare and contrast the characteristics of places to determine the likelihood of an event
- consider how the characteristics of a place influence our activities

Teaching Approach

- Learning-for-use

Teaching Methods

- Discussions
- Hands-on learning
- Visual instruction

Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
  - Information, Media, and Technology Skills

    - Information, Communications, and Technology Literacy
  - Learning and Innovation Skills
    - Communication and Collaboration
- Critical Thinking Skills
  - Applying
  - Understanding
- Geographic Skills
  - Acquiring Geographic Information
  - Asking Geographic Questions

National Standards, Principles, and Practices

NATIONAL COUNCIL FOR SOCIAL STUDIES CURRICULUM STANDARDS

• **Theme 3:**
People, Places, and Environments

NATIONAL GEOGRAPHY STANDARDS

• **Standard 1:**
How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS & LITERACY

• **Reading Standards for Informational Text K-5:**
Integration of Knowledge and Ideas, RI.3.7
• **Reading Standards for Informational Text K-5:**
Integration of Knowledge and Ideas, RI.4.7

• **Reading Standards for Informational Text K-5:**
Integration of Knowledge and Ideas, RI.5.7

THE COLLEGE, CAREER & CIVIC LIFE (C3) FRAMEWORK FOR SOCIAL STUDIES STATE STANDARDS

• **Geographic Representations: Spatial Views of the World: D2.Geo.1.3-5:**
Construct maps and other graphic representations of both familiar and unfamiliar places.

PREPARATION

What You'll Need

MATERIALS YOU PROVIDE

- Atlases (1 per student or 1 per pair)

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per classroom, Projector

PHYSICAL SPACE

- Classroom

GROUPING

- Large-group instruction

RESOURCES PROVIDED: WEBSITES

- National Geographic Education: MapMaker Interactive

RESOURCES PROVIDED: HANDOUTS & WORKSHEETS

- Earth's Grid System
- A Summer Day

RESOURCES PROVIDED: MAPS

- MapMaker 1-Page Map: World

RESOURCES PROVIDED: INTERACTIVES

- NG MapMaker 1-Page Map: United States

RESOURCES PROVIDED: IMAGES

- Lines of Latitude
- Lines of Longitude

BACKGROUND & VOCABULARY

Background Information

Understanding the latitude and longitude (lat/long) grid system allows students to communicate about any place on Earth. Lat/long is a form of global address. If you want to give an exact address on land, you can use street numbers and postal codes. Out at sea or deep in a wilderness it may be more difficult to describe location. Using degrees of latitude and longitude enables you to name an exact location.

There are many real-life applications for using latitude and longitude, including scientific research to track animal movements or getting directions using satellite technology when you are lost.

Prior Knowledge

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Recommended Prior Activities

- Introduction to Latitude and Longitude
- Location and Place: A Geographic Perspective

Vocabulary

Term	Part of Speech	Definition
cartographer	*noun*	person who makes maps.
coordinates	*noun*	a set of numbers giving the precise location of a point, often its latitude and longitude.
degree	*noun*	unit of measurement for latitude and longitude.
Equator	*noun*	imaginary line around the Earth, another planet, or star running east-west, 0 degrees latitude.
grid	*noun*	horizontal and vertical lines used to locate objects in relation to one another on a map.
latitude	*noun*	distance north or south of the Equator, measured in degrees.
longitude	*noun*	distance east or west of the prime meridian, measured in degrees.
map skills	*noun*	skills for reading and interpreting maps, from learning basic map conventions to analyzing and comprehending maps to address higher-order goals.
prime meridian	*noun*	imaginary line around the Earth running north-south, 0 degrees longitude.

For Further Exploration

Reference

- National Geographic: Tracking Animal Migrations GeoStory

Websites

- The Degree Confluence Project
- Movebank—Animal Tracking Data

Name _____ Date _____

A Summer Day

Read the brief passage below. Find the locations in question 1 using a map of the United States. Use the clues in the passage and the locations to solve the puzzle. Use atlases to help in identifying the state referred to in the passage.

It was a great summer day! The air was cool but felt warm on my back as my father and I loaded firewood onto the pickup truck. There was some maple, pine, and oak, but most of the wood was white birch. After loading the truck we drove home on the dirt road that led out of the woods.

It is my job to stack the firewood neatly in the shed next to our corn silos. It's also my responsibility to make sure that our herd of guernseys is properly fed. I am going to go fishing in our pond after I finish my chores. That's my favorite part of a summer day!

1. In what states are the following coordinates found?

   a. 33° N latitude, 112° W longitude. Name the state. _____

   b. 47° N latitude, 105° W longitude. Name the state. _____

   c. 44° N latitude, 89° W longitude. Name the state. _____

   d. 28° N latitude, 82° W longitude. Name the state. _____

2. This story most likely takes place in which of the above states? Give reasons for your answers.

   _____

   _____

   _____

   _____

   _____

   _____

3. Select one of the coordinates above and write two paragraphs describing some of the physical and cultural features of the area on the back of this worksheet. Show your paragraphs to a classmate and see if he or she can determine which location (coordinates) you are describing.

Name _____ Date _____

Earth's Grid System

Use the map below to answer the following questions. Write a letter on each blank. Then use the numbers below the blanks to solve the riddle.

1. Which city is located near 45° N, 108° W?

____	____	____	____	____	____	____	____
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**

2. Which city is located near 40° N, 89° W?

____	____	____	____	____	____	____	____	____	____	____
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**

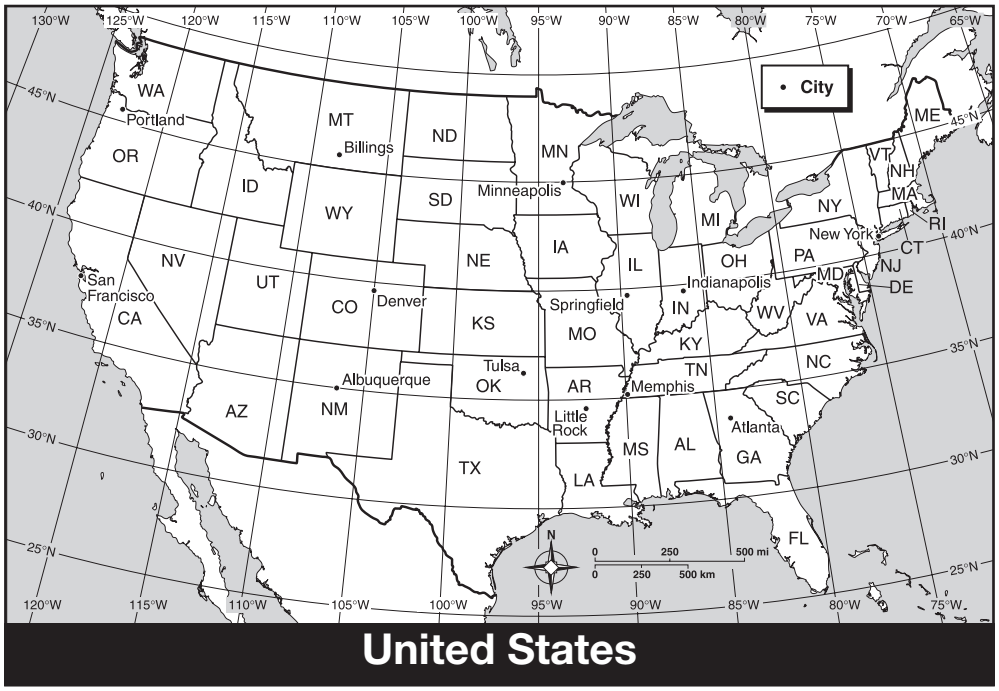
3. Which city is located near 33° N, 84° W?

____	____	____	____	____	____	____
20	**21**	**22**	**23**	**24**	**25**	**26**

4. How did the geography teacher say goodbye to his class?

"Have a ____ ____ ____ ____ day!"

14 **11** **5** **19**



United States

NATIONAL GEOGRAPHIC

NatGeoEd.org