

Oconto County 4-H

As you work on your project throughout the year, you may find it helpful to take pictures and keep notes. They can come in handy as you plan for ways to share what you have learned and look back on what you've done.

Suggestions for showcasing your project work:

- Tell about what you've learned at **Speaking Fest**
- Show what you've learned at **Demonstration Fest**
- Take your project to the **Oconto County Fair**
- Enter local contests **outside of 4-H** like essay contests, shows and speech contests
- Look for creative ways to share what you've learned with your **club**, your **school** and your **community**

Stay in Touch!

Here's how you can contact your key leader(s) this year:

John Huff (715) 582-3981

Adult Leader

Laura Huff (715) 582-3981

Youth Leader

*Written by Paula Huff, University of Wisconsin-Extension and Laura Huff,
4-H Youth Leader, August 2007*

Developed by Oconto County 4-H Project Development Committee

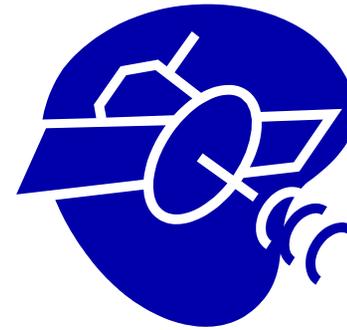
Format by Johnathan M. Kruse



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WELCOME TO THE OCONTO COUNTY 4-H

GEOSPATIAL PROJECT!



Places, spaces, and technology...

*In its simplest form, **geospatial** involves taking the characteristics of the earth and connecting them with their location.*

*In this project, you'll explore geospatial data gathered from lots of different sources, and maybe even see ways in which you can add data! The Project Literature, "**Exploring Spaces, Going Places**", is available on Computer disk.*

NOTE: *This Activity Guide is recommended for 6th grade and above. You will need a computer and internet access.*



Have fun!

Beginning of the Year

Here is what I would like to learn this year (my goal) in the Geospatial project:

During the Project Year

Here are the steps I will take to meet my goal:

During the Project Year

Here's what I learned, and how I felt about my project experience:

Did you enjoy Geospatial?

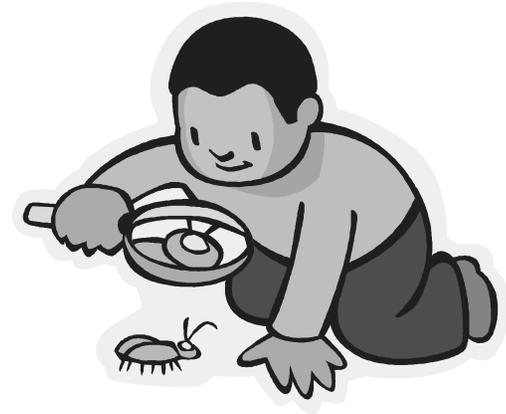
Was this project fun for you? If not, **that's okay**. It isn't likely that you'll like every project. What's important is that you **tried something new** and that you **learned something**.

What did you learn in this project? What could you have done better? What are you really proud of? These are all good questions to think about when you finish a project.

Thanks for trying out the GEOSPATIAL PROJECT!

If you liked this project, you should consider signing up for another year! You will get to dig deeper into the project and discover many new and exciting things.

It's never too soon to get started on next year's projects!



See you in the next project year!

TRAVEL BUG. Travel bugs are tracked all over the world by using the special numbers they have printed on them. Take it home, log it on the *Geocaching* site, place it in another cache, and follow its path!



SUGGESTIONS: Plan on attending a *Geospatial Project Meeting* or inviting the *Key Leaders* (see back page) to come to your club to introduce the members to *Geocaching*!

Notes



November

A **Geographic Information System** (*GIS*) puts **location** and **information** together through **technology**.



One of the words that you will hear a lot as you learn more about *GIS* is **LAYER**. Each layer is a different feature tied to the geography of the place.

Let's take a look at **GIS** and **LAYERS** in a game on the National Park System's web page called "**Name that Park**". Here's the web site: www.nps.gov/interp/gis_day/list.htm

Pick a park to get started....and notice that you can add layers to help you figure out the name of the National Park. After you have finished with game, see if you can answer these questions:

- What were the names of a few of the layers that you added to the Parks?
- Which of the layers were the most interesting to you?
- What other kinds of layers do you think can be added to maps of geographic locations?
- What types of layers might a farmer find interesting? A fisherman? A pilot?

December

Did you know that the government has a **National Geospatial Intelligence Agency**?



This agency was responsible for tracking the damage done by Hurricane Katrina, following the path of the space station *Mir* as it headed for a junkyard in Space, and it monitored security for the Pope to visit St. Louis.

The **NGIA** has developed a game to introduce kids to Geospatial information. You can play the game at <http://www.nga.mil/ngakids/index.html>

Select "**Kids' Pages**" and take a tour with the Terry Firma, as he searches for his lost friend. A page for older kids is expected to be up soon.

Remember: In this game, you are seeing earth as it appears from SPACE. The images (pictures) were taken with a satellite!

After trying the game, see if you can answer these questions:

- What was it like, trying to figure out what you were seeing?
- Which things were easy for you to see?
- Which things were hard for you to see?

Try this! Can you draw a map of your house and yard as it might look from a satellite?

Caches are developed by people like you and me. People develop caches to entertain others and to share a really neat spots with fellow cachers.

Finding a Cache

Plug the **coordinates** into your GPS and use the compass page to find the general location. Because your hand-held GPS unit is accurate to only about 30 feet, you've still got a search on your hands. Look in the obvious places — under logs, in hollow trees, and under branches. If that doesn't work, start looking in the not-so-obvious places like hanging from the branches of trees.

Sometimes the caches will be the size of coffee cans, sometimes they will be the size of a film canister. The cache description will tell you what size, and the difficulty of the hide. It's probably best to start out with a regular sized EASY cache, until you get the hang of it.

I found it — what do I do now?

Inside the cache you will find a log book and a pencil. Sign it! This is the "proof" that you were there. And now you get to take a trinket that another cacher left, and replace it with something that you brought. Popular cache items are tiny toys, key rings, and coins. Remember to watch out for MUGGLES! You don't want anyone stumbling across a cache.

What's the thing with the dog tag?

If you find an item with a dog tag attached, it is likely a

THREE is the magic number for locations. If you know three points based on known reference points, you have a location. With these three points, you are said to be **TRIANGULATING** location.

That's exactly what happens with Global Positioning System (GPS). Satellites high in orbit transmit radio signals that are **KNOWN POINTS OF REFERENCE**. If we have three or more of them being read on our Global Positioning System (GPS), our GPS then "knows" its own location!

Can you set up a new kind of Hide-'n-Seek for your 4-H club that would demonstrate TRIANGULATION?

July

Ready, set, **GEOCACHE!** Geocaching is the newest craze to sweep the country. It's like one **BIG** scavenger hunt that only some of the people in the world know about. (The people who don't know about it are called **MUGGLES**.)



To **GEOCACHE**, you need a hand-held GPS unit and access to the website www.geocaching.com. From the website, you can find the coordinates (see May) of caches hidden anywhere in the world. Let's start with caches near your home. From the home page, locate the tool bar on the left side of the page. Select "**Hide and Seek a Cache**". Fill in your zip code, and make the distance 50 miles. A page of caches should come up. Click on one. You'll likely find a description of the site, and then some "postings" from folks who have found the cache.



**4-H Youth
Favorite Places**

"A national 4-H hands-on
and online GIS community
mapping project"

www.youthfavoriteplaces.org
For more information email: 4hgisgps@extension.umn.edu
The 4-H Name & Emblem is protected under "18 USC 707."

Adapted from Minnesota and Idaho 4-H

January

4-H'ers all over the United States have favorite places — it may be a fairgrounds or it may be the local 4-H camp. Now 4-H'ers have a way to share those favorite spots!

If you go to the address listed on the business card **above** you will find yourself at **4-H Youth Favorite Places**. It's home to pictures from 4-H'ers like yourself. Click on the **map** and see if you can find these pictures:

- The Parker Library in Arizona
- The Holiday Lake 4-H Center in Virginia
- Joshua Tree National Park in California
- Lincoln Skate Park in Oregon
- A blueberry farm in Maine

If your club is interested in posting a picture, have your adult leader click on **REGISTER** to get started. For more ideas for this site, see Activity 5 in "Exploring Spaces, Going Places".

February

Here's a neat, easy spot — that has maps and aerial photos of the world: <http://www.terraserver-usa.com/>

All you have to do is type in an address on the tool bar on the right. If you are like most people, you'll start with your own address. The next screen will let you chose whether or not you want to see the topographic ("topo") map or the aerial photo of the address.

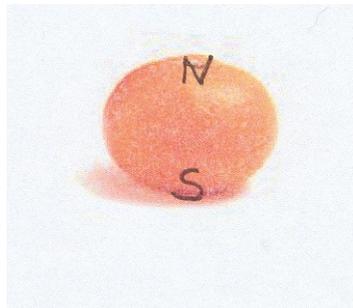
A topo map is a drawn map that shows the elevations of the area. An aerial photo is an actual picture taken from an airplane. It's interesting to compare the two!

Use the **In** and **OUT** buttons and the directionals (**NORTH**, etc.) to move the map. Can you figure out your route to the grocery store from your home?

March

Grab an orange, your thinking cap, and a sharpie! We're exploring latitude and longitude this month!

To get your orange ready (it is going to turn into a model of the EARTH), draw the letter "N" at the top of the orange and an "S" at the bottom. If you were to jab a stick through the orange (but let's NOT), the N and the S would be in a straight line.



Now we need the **EQUATOR**. The equator is an imaginary line that divides the earth into two equal parts. The top parts is called the Northern Hemisphere and the bottom part is called

June

Triangulating a Position

Let's start out this month by thinking about the Oconto County Fair Grounds. Here's the set-up:



Chris Clover has lost a rare coin that he had taken to the Fair. His friend, Andy, found the coin on the ground and is giving Chris hints so that he can find it himself. Andy thinks this is fun, but Chris isn't so sure....He just wants to find his coin!

Here's the first hint:

1. The coin is about 20 feet of the Rabbit/Poultry Barn.

Hint: Draw the Rabbit/Poultry barn on a piece of paper (and leave some room for the clues that are coming next!) Draw dashed lines indicating where the coin could be

2. The coin is about 20 feet from the Dairy Barn.

Hint: Draw the Dairy Barn in your map. Draw dashed lines where the coin could be.

Have you narrowed down the location of the coin? Is there more than one place that it might be?

3. Finally, Andy says this: The coin is about 30 feet from the Woodcarver's tent.

Draw in the Woodcarver's tent, and dashed lines where the coin could be.

Now what happened? Does Chris know exactly where to look for the coin?

May



Isn't the **GEOSPATIAL PROJECT** an exciting place to be? It involves lots of different technology and lots of different places.

If there is one thing for sure, the Geospatial project will give you a different view of the world. And speaking of a different view of the world, let's explore the world through **Google Earth** at www.earth.google.com (where you can download the program). After you have downloaded it, you can always find it in "Programs" on your computer. Remember to **check with an adult** before downloading **ANY** program to your computer.

Once you have downloaded and installed Google Earth, you are ready to "visit" different places around the world. Let's start out by finding the Extension office! Here's how:

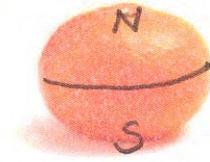
Find "Search", then "Fly To" and type in: **301 Washington Street, Oconto WI**. Click on the magnifying glass, and watch the screen. What you are seeing is a **satellite image** from space.

Run your cursor over the upper right hand side of the screen and a tool will pop up. Use it to get closer (+) or farther away (-).

Are you ready to try some other places? How about your house? Type in your address and see what you find.

You can't usually see up close in rural areas, but you sure can in big cities. Try to find a taxi cab in New York!

There are lots of neat features of the maps on **Google Earth**. Explore and see what you can find!



the Southern Hemisphere. Get your sharpie and draw a line around the **MIDDLE** of your orange. Each of the poles - North and South - will be the **SAME** distance from the equator **IN ALL PLACES**.

The equator is the base for what we call **LATITUDE**. Above and below the equator are more imaginary lines called lines of latitude. Those lines lie either above or below the equator, the same distance from the equator in all places (they are **PARALLEL** lines). They run **EAST** and **WEST**.

The latitude measurement for the equator is **0 degrees**. Latitude measurements increase to 90 degrees north at the North Pole (N on your orange) and 90 degrees south at the South Pole (S). All the rest of the lines of latitude lie somewhere in between. If we were to give the latitude measurement for the North Pole, we would say **North 90 degrees**. We'd write it like this: **N 90°**



And now it's time for the **PRIME MERIDIAN**. Take your sharpie and draw a straight line between the North Pole (N) and the South Pole (S). This line is a "line of longitude", called the **PRIME MERIDIAN**. The Prime Meridian starts at **0 degrees** at Greenwich, England. Longitude lines move east and west from Greenwich. So, these lines of longitude run **PERPENDICULAR** to Lines of Latitude. Lines that are to the east of the Prime Meridian are measured in positive degrees up to 180, and those are to the west are measured in negative degrees to 180. The lines themselves run **NORTH** to **SOUTH**.

We could describe a location in Wisconsin in three different ways!
We could say:

West 88 degrees

W88°

-88°



Did you know that the **EXACT** location of any place on earth can be described by its latitude and longitude? In the geospatial lingo, we call these numbers the **COORDINATES** of the site.

Are you wondering what **YOUR** home's coordinates are? Here's a site that will quickly convert any US street address into coordinates: www.geocoder.us Scroll down on the page to "See the Geocoder in Action". Enter your address, and hit "Search"!

Look carefully at your result. You will recognize the Latitude reading N 44 (or so) and the Longitude reading W87 (or so), but there will be **MORE** numbers after those. The latitude and longitude readings are made even more exact with further divisions called **MINUTES** and **SECONDS**. They are called that even though they have **NOTHING** to do with **TIME!**

Challenge: Can you find out how latitude and longitude are measured? If math is your thing, here's a great site that will get you started thinking about lines and angles and maps: http://nationalatlas.gov/articles/mapping/a_latlong.html

April



Not all geospatial information is **NEW!** The University of Virginia Geospatial and Statistical Center has **OLD** data that they have linked to locations.

There are **LOTS** of interesting things to find on their website at <http://fisher.lib.virginia.edu/collections/stats/histcensus/>

They even have information from the year 1790!

Try this:

Go to the web address listed above. Choose "**1790**" under "**Choose a Census Year**". In "**General Population**", scroll down to "**families with 11 or more members**". At the bottom of the page, click on "**Submit Query**".

Look at the information that came back. Can you figure out the following?

- How many families in the United States had families with 11 or more members?
- How many states were there in 1790?
- Click on the **Map It!** Button in the data column (families with 11 or more people) and you get a **MAP** of your data!

This information was put together from the United States Censuses which has been taken every 10 years since 1790. Check out some of the other census years — more information was added each year! Can you make a map of the number of persons aged 7–13 attending school in 1920?

Explore this page and see what else you can find!