ALL ABOUT MAPS

Have you ever used a map to find your way somewhere – to a friend or relative's house, a park, or a hiking trail? Maybe you've helped your family navigate to a favorite campground or new vacation spot by tracing your route on a map. Maps are an important tool to help us understand our surroundings and the larger world around us.

A **map** is a drawing of all or part of the Earth's surface. Maps show features that we can see, such as rivers and lakes, forests, mountains, and roadways. They may also show things that we cannot see, like state boundaries and weather patterns. Most maps are drawn or printed on a flat surface. A map displayed on a round surface is called a **globe**.

An assortment of paper maps

A globe

The art and science of map making is called **cartography**, and the people that make maps are known as **cartographers**. In addition to the precise scientific methods and mathematical calculations needed to make an accurate map, an artistic touch is also important. Cartographers select which colors, patterns and symbols to use, and they have to figure out how to show information in a way that is easy for the user to understand.

Parts of a map

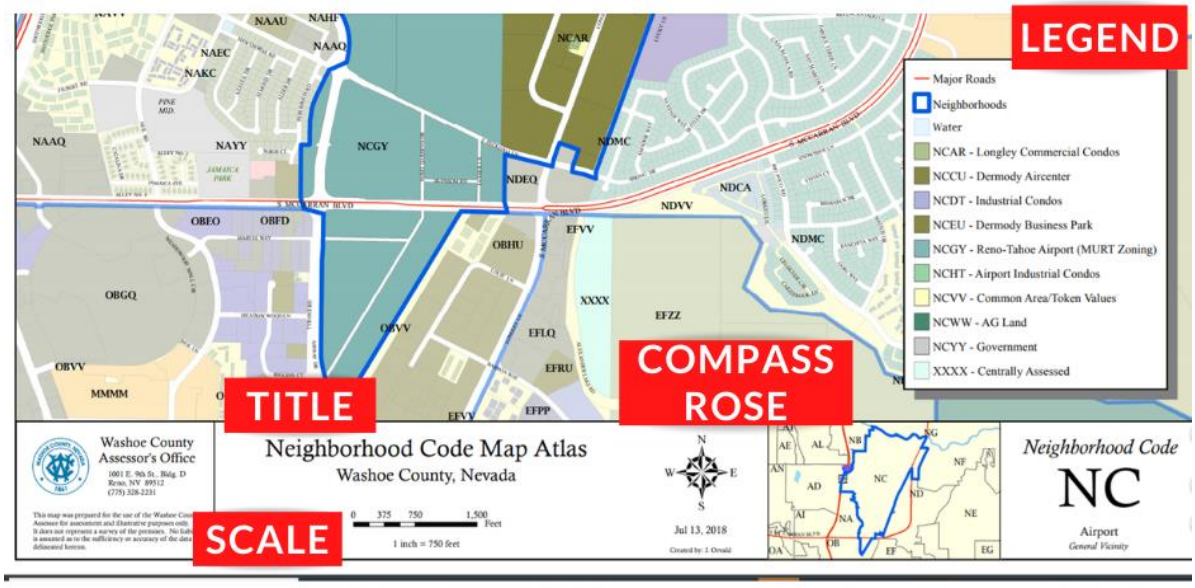
There are a few important elements that every map should have:

title - What is the map about? What kind of information does it show -- highways, animal habitat, rainfall, hiking trails, ocean currents, etc.?

legend - What do the symbols on the map mean? Different colors, shapes, patterns, and line types (solid, dotted, dashed) all have meanings that are important for the user to understand in order to make sense of the map.

scale - How much land, or area, does the map cover? Is it a city, state, or world map? How much distance on the ground is represented on the paper or digital map?

north arrow, or compass rose - Which way is up, or north? North is usually shown at the top of a map, but there are sometimes reasons to design a map in other ways.



This map of the area around the Reno Tahoe International Airport was copied from the Washoe County Assessor's Office website, then clipped and edited to show the different parts of a map.
http://renosparks.org/interest-pages/washoe-county-neighborhood-maps/

To create a map, cartographers have to transform information about a round object (the Earth) into a flat surface (the map). This mathematical process is called a **projection**. Imagine trying to flatten an orange peel. Can you make all the pieces line up perfectly without squashing, tearing or moving them around? You can flatten the peel a little, but it will look very different from when it was wrapped tightly around the orange.

There is no perfect way to turn a round object into a flat map without **distorting** (pulling or twisting out of shape) some part of the round object. Cartographers use different map projections depending on the purpose of the map and what types of information it is going to show. Remember that a map is always smaller than the area it represents.

ACTIVITY #1: Find your home on a map

Look at maps, aerial photos and satellite imagery of your neighborhood and surrounding area at different scales. Visit websites like MapQuest or Google Maps that allow you to select an area, view them as maps or satellite imagery, and zoom in and out for more or less detail. Can you zoom in enough to see your home?

Now, zoom out and see if you can find other landmarks that you recognize. Zoom out far enough to see the city of Reno. Keep going and you'll be able to see the Truckee River, Sparks, Lake Tahoe, and Carson City. Keep going! What all can you see and recognize? If you zoom out further, you can find Sacramento, San Francisco, Las Vegas and beyond! What does your house look like now?

Here's an example using imagery of the South Valleys Library. Let's look at our library at different scales on satellite imagery and on a map. The first image is a close-up overhead view with lots of detail (figure 1). We can see all the mechanical equipment on our rooftop and a few cars in the parking lot. Then if we zoom out a bit. and we can also see the surrounding ball fields and the I-580 freeway (figure 2).

Figure 1

Figure 2

Next, let's zoom out a bit further and look at a map of the I-580 and Mount Rose Highway intersection where the library's location is marked (figure 3). Now the surrounding neighborhoods drawn on the map can be seen.

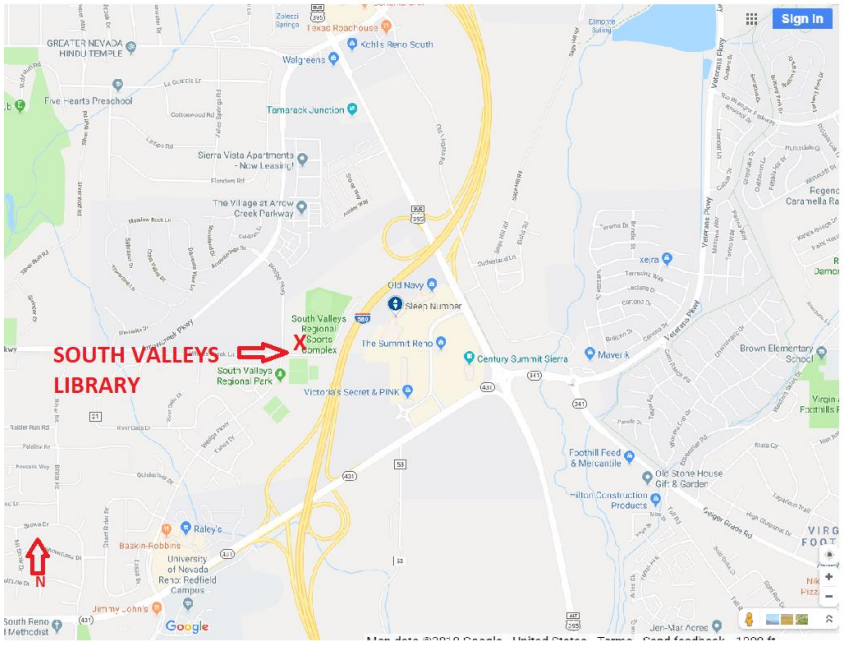


Figure 3

And finally, we can zoom out just a bit further to a view of the library (it's a very tiny dot here in figure 4) that also includes Washoe Lake and the northern tip of Lake Tahoe's Crystal Bay. You can see a lot more land area in this image but no details of the library because the scale has changed as we've zoomed out.

Figure 4

The Reno/Sparks area is experiencing lots of growth, with new roads, buildings, and neighborhoods under construction throughout the Truckee Meadows. Our landscape is visibly changing very fast. Because of that, new areas that were recently built may or may not be visible on the images that you have available.

On your next trip across town or to a vacation spot, look at a map of where you are going and see how many landmarks you can identify.

ACTIVITY #2: Take a walk, and make a map

Materials

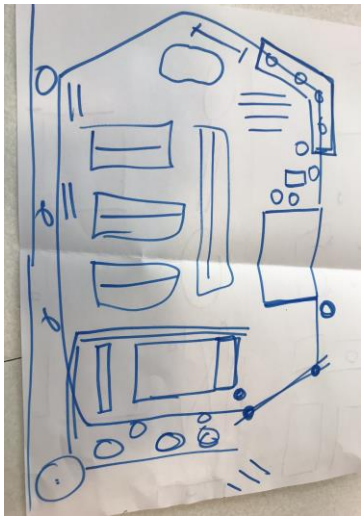
- paper, cardboard, poster board, or construction paper
- pen, pencil, markers, or crayons
- Optional: camera, binoculars

1. Gather up your materials and head outside.
2. Walk around your yard and draw what you see. Keep your eyes open and take a close look around. Notice what's above your heads, under your feet, across the street, and on the horizon.
3. Take a grown up with you and continue out along the street or sidewalk. Make your way around the neighborhood, maybe to a nearby park or school. Keep sketching along the way, and add features and details to your map as you go.
4. Label the names of streets, homes, parks, schools, other buildings, and anything else of interest as you construct your map.

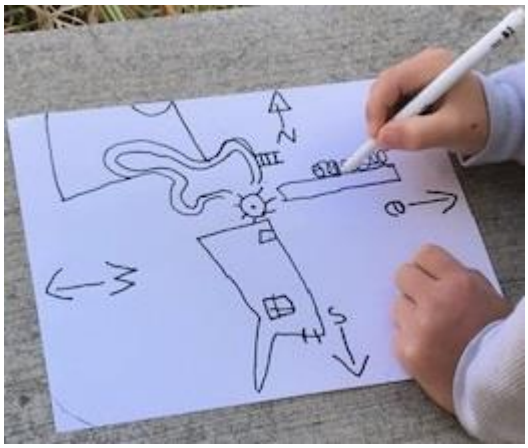
5. If you find animal tracks, mark them on your map and see if you can identify what animals made them by using the internet and identification guides from the library. Do the same thing with anything else of interest (plants, rocks, etc.). Mark them on your map and try to identify them later.
6. Make sure to include a title for your map, plus a north arrow and legend if you've used any symbols. It can be hard to figure out and calculate your scale, so that's not necessary for this activity.
7. For younger kids or in case of bad weather, try drawing a map of a room in the house. You can walk through it and sketch or try to draw it from memory.

What did you see/hear/smell that was especially cool? Did you include those things on your map?

Here are some examples of maps drawn by our young patrons during a library STEAM program about maps:



Inside the library



Just outside of the library

Neighborhood around the library

ADDITIONAL RESOURCES

Books available from the Washoe County Library System:

Follow that Map!: A First Look at Mapping Skills by Scot Ritchie

How to Read Maps by Joe Fullman

Kat's Maps by Jon Scieszka

Mapping Sam by Joyce Hesselberth

Maps by Aleksandra Mizieliński

Maps and Geography by Ken Jennings

Me on the Map by Joan Sweeney

Tracks, Scats, and Signs by Leslie Dendy

Trees by Allen J. Coombes

The Whole World in Your Hands: Looking at Maps by Melvin Berger and Gilda Berger

Videos:

CBS This Morning, "Saving the Art of Mapmaking" https://youtu.be/M_VmeZoFh5I

Clarendon Learning, Maps for Kids, "Learn How to Read a Map and Other Skills in This Fun Introduction to Maps" https://youtu.be/UZaTK7B0doE

SciShow, "Can You Make an Accurate Map?" https://youtu.be/8I_VpC6IuJs

Websites:

Flattening Earth, #gisWithKids, Introduction to Map Projections
https://storymaps.arcgis.com/stories/7d2abd9968b64b96902f72cce12ea5c5

National Geographic, Resource Library, Concept of Place
https://www.nationalgeographic.org/topics/resource-library-concept-place/?q=&page=1&per_page=25

National Geographic, Resource Library, Interpreting Maps
https://www.nationalgeographic.org/topics/interpreting-maps/?q=&page=1&per_page=25