Hi! Welcome to module 1, part 1 of our GIS for journalists course. In this video I'm going to talk about what is a map. A map is a representation of a place. In the excellent access maps cartography guide, which was one of your readings this week, they make a really good point; a map is just a representation of a place. That means that every map is also an imperfect representation of a place, and here's why:

One of the first constraints that cartographers face is this: the Earth is round and maps are flat. The next time you peel an orange try to make the peel flat and keep it all in one piece, it's really difficult. So that's the problem with making maps and one of the first difficulties that we face.

With that in mind, I'm going to talk about some basic map terminology that'll help us understand how cartographers throughout history have dealt with this round earth flat map problem. So the first thing we're gonna learn about is latitude and longitude. So, how do you measure a location on Earth’s surface?

Imagine that the whole globe is covered in a big number grid, latitude lines run east to west and they're parallel to each other. The equator which wraps around the middle of the globe is 0 degrees and the north and south poles are each 90 degrees. These lines never touch each other.

Longitude lines, meanwhile, read north and south and meet at the north and south poles. They start at the prime meridian which is 0 degrees, and run east and west of the International Date Line Pacific Ocean, which is 180 degrees. So these lines together form a grid that we can use to locate places on the Earth's surface.

Next we'll talk about how we measure the scale of the map and how maps are generalized. So scale in a map is defined mathematically often expressed as a representative fraction. So 1 inch on the map might equal 100 miles. This is all relative and we're talkin about zoomable digital maps that we and our readers are used to using, so when you zoom in one inch might equal 100 feet or less.

Mapmakers reduce and generalized data on more zoomed out or smaller scale maps like this one of the whole United States in order to avoid all the clutter and extra detail, and then when you're zoomed in you'll more detail and then when you get to the closest in the map, you'll get a lot more detail to see all the roads.

My cartography instructor in college was actually a former drill sergeant and he said every single map needs a scale bar. I agree with him most of the time, but we'll get to that later. So remember the orange problem? Cartographers have developed a few specific ways to deal with that projections are what we use to represent the round world on a flat map surface, and there's a few standard ways for projecting the world the round world onto a flat surface you could do a central ago projection.

You could do a centrilical projection, a conical projection (good for something at one of the poles) or a planar projection where it is just kind of a flat plate and against the round globe. But all of these projections are imperfect. So we like to say that projections make geographers sad, each one distorts something about the round world and preserves other things.

They can distort shape, maps to preserve shape or good for topographic maps, weather maps or property maps. This USA Today weather map was one that preserves like the shape of the US as you think of it really well, but does not preserve other things so well. They preserved area, on maps to preserve area the size of any area on the map is in true proportion to its size on the Earth.

This is good for maps which quantitative attributes by area such as election maps or density maps. Maps can preserve distance, no map can accurately show the distance between every single point on the Earth's surface, but some maps like this one that's based on a conical projection preserves distance, but distorts everything else.

It's good for showing the distance between one point and everywhere else, and maps can preserve direction, that's SADD (shape, area, distance or direction). This web mercator map preserves direction, but distorts distance and area, especially in the polls.

Greenland looks really huge, but in reality South America is eight times larger than Greenland. That makes it great for navigation. It was originally designed for sailors, but it's in its scale’s up nicely preserving the turns on neighborhood streets at 90 degree angle. That's why you see Google uses a version of this a web mercator map, for navigation, but it's not great at everything.

So there are two general types of maps. So before joining the Texas Tribune this spring, I worked at the Washington Post and made maps there for about five years. I'm going to use the post coverage of one event in 2014, a summit for leaders from nations in Africa to illustrate two different types of maps.

The first type is a reference map, and this shows places. For journalists, this might be the map of an event venue or street closures. It's informative readers need to know where to go and where what streets to avoid during this event.

The second type of map is the mattock this shows data about the world. These maps are more abstract and require a really careful design to avoid misrepresenting the data. In most of this course, we're going to focus on teaching you how to make the mattock maps.

So there's too many things to take away from this lesson. The first is a map is not an objective depiction of reality, at this very base level maps are translating the three-dimensional world into two dimensions.

And the second thing is that the practice of cartography is as much about removing things from a map as it is depicting them on a map. In the next video in this module we're going to talk about the basics of when to use a map to tell a story. See you soon!