

THE GEOGRAPHER'S TOOLS

Name _____ Hour _____ Due Date _____ Score _____ / 5

Maps and Globes

A geographer's tools include maps, globes, and data that can be displayed in a variety of ways. The oldest known map is a Babylonian clay tablet created about 2,500 years ago. The tablet is about four inches high and shows the Babylonian world surrounded by water. Over the centuries, mapmaking evolved into a very complex task. However, a map's function has remained the same to show locations of places, landforms, and bodies of water, and where they are in relation to other parts of the earth.

Two Dimensions or Three

A globe is a three-dimensional representation of the earth. It provides a way to view the earth as it travels through space. But since earth is a sphere, we can see only one half of it at any time. For certain tasks, globes are not very practical because they are not easily portable. People often prefer to use maps, which are two-dimensional

graphic representations of selected parts of the earth's surface. Maps are easily portable and can be drawn to any scale needed. The disadvantage of a map is that distortion occurs as the earth's surface is flattened to create the map. A cartographer, or mapmaker, reduces some types of distortion by using different types of map projections. A

map projection is a way of drawing the earth's surface that reduces distortion caused by presenting a round earth on flat paper.

Types of Maps

The three types of maps are general reference maps, thematic maps, and navigational maps. A general reference map is sometimes called a topographic map, which is a representation of natural and man made features on the earth. Thematic maps emphasize specific kinds of information, such as climate or population density. Sailors and pilots use the third type of map - navigation maps.

The Science of Mapmaking

A cartographer decides what type of map to create by considering how the map will be used. Keeping that purpose in mind, he or she then determines how much detail to show and what size the map should be.

Surveying

The first step in making a map is to complete a field survey. Surveyors observe, measure, and record what they see in a specific area. Today, most mapping is done by remote sensing, the gathering of geographic information from a distance by an instrument that is not physically in contact with the mapping site. These data are gathered primarily by aerial photography or by satellites. The data gathered includes information such as elevation, differences in land cover, and variations in temperature. This information is recorded and converted to a gray image. Cartographers then use these data and computer software to construct maps.

Satellites

Today, geographers rely heavily on satellites to provide geographic data. Two of the best-known satellites are Landsat and GOES. Landsat is actually a series of satellites that orbit more than 100 miles above the earth. Each time a satellite makes an orbit, it picks up data in an area 115 miles wide. Landsat can scan the entire earth in 16 days.

Geostationary Operational Environment Satellite (GOES) is a weather satellite. This satellite flies in orbit at the same speed as the earth's rotation. By doing so, it always views the same area. It gathers images of atmospheric conditions those are useful in forecasting the weather.

Geographic Information Systems

The newest tool in the geographer's toolbox is Geographic Information Systems (GIS). GIS stores information about the world in a digital database. GIS has the ability to combine information from a variety of sources and display it in ways that allow the user to visualize the use of space in different ways. When using the system, geographers must look at a problem and decide what types of geographic information would help them solve the problem. The information could include maps, aerial photographs, satellite images, or other data. Next, they select the appropriate Layers of information. Then, GIS creates a composite map combining the information.

Global Positioning System

A familiar tool of geographers is GPS or Global Positioning System. It was originally developed to help military forces know exactly where they were on the earth's surface. The system uses a series of 24 satellites called Navstars, which beam information to the earth. The exact position—latitude, longitude, altitude, and time—is displayed on a hand-held receiver. Hikers, explorers, sailors, and drivers use GPS devices to determine location. They are also used to track animals. Geographers use a variety of other tools including photographs, cross sections, models, cartograms, and population pyramids. These tools help geographers to visualize and display information for analysis.

They are looking for patterns and connections in the data they find

How long ago was the first map created? What function of maps has remained the same over time?

1. A 3 dimensional representation of the earth is called a _____.
2. A 2 dimensional representation of the earth or selected portions of the earth's surface is called a?
3. What advantages do maps have compared to a globe? _____
4. What is distortion? What things on a map can be distorted? _____
5. What is a cartographer? _____
6. The process of putting the round earth on a flat surface is called _____.
7. What are the 3 types of maps mentioned in the text? _____
8. Based on what you know and what you read in section 2, how do you think mapmaking has changed over time? _____