Visualize the Arctic and Antarctic Circle

A map projection is a representation of the 3D earth on a 2D plane. Any way that the earth is represented on a 2D plane results in distortion both by size and shape. Map projections are selected for different studies that present the least amount of distortion of the study area. The map used in ArcGIS Online is in the Web Mercator projection, which is the standard for sharing data on the web. Like any projection, Web Mercator has limitations. As with all Mercator projects, the North and South Poles are distorted.

Build skills in these areas

- Examine different map projections.
- Visualize the Arctic and Antarctic Circle
- Interpret latitude and longitude lines.

What you need

- Account not required
- Estimated time: 30 minutes

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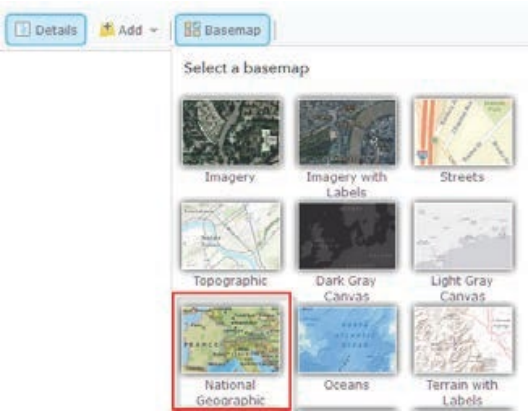
1. Open map and observe projections, Arctic, and Antarctic Circle

Account not required

1. Go to your ArcGIS organizational account.
2. On the upper ribbon, click Map.

3. On the right corner, click Modify Map.

4. Change the basemap to National Geographic.

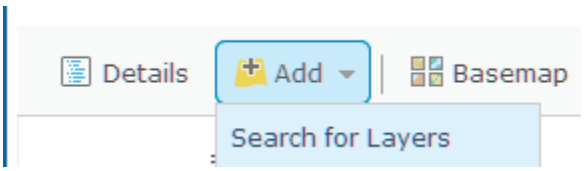


Q1 Identify the major lines of latitude.

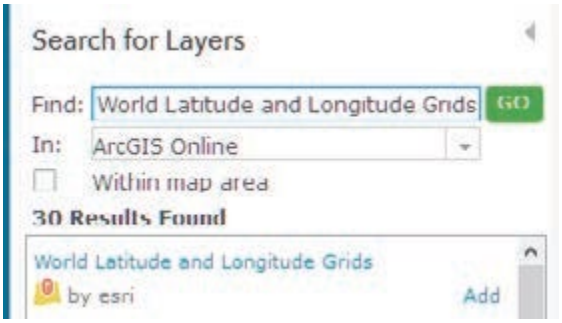
Q2 What do you notice about the spacing of the line?

Q3 As mentioned above, the map projection used for ArcGIS Online is Web Mercator. Can you identify areas of distortion?

5. Zoom out to a world view.
6. Click + Add>>Search for layers.



7. Use the following parameters in Search for Layers:
    a. Find: World Latitude and Longitude Grids by Esri
    b. In: ArcGIS Online
8. Click Add.



9. Click DONE ADDING LAYERS.

    The Esri basemaps are all multiscale maps that allow you to view geographic data across a range of scales—also know as zoom levels. Most data do not need to be shown across all zoom levels

10. Examine the spacing between the latitude lines.

    Q4 What countries are above the Arctic Circle?

    Q5 What is below the Antarctic Circle?

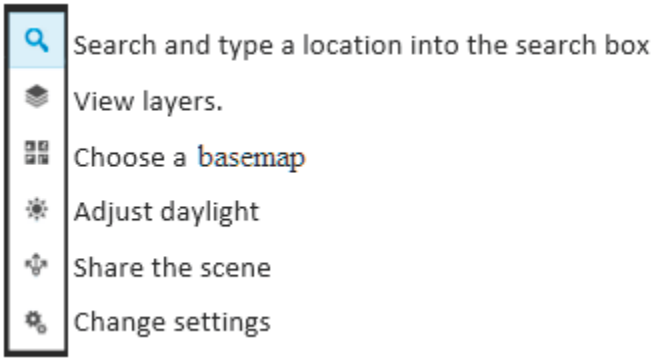
    Q6 What continent is closest in size to Greenland?

    Q7 Why or why not is this a good projection to study the Arctic?

In the next section of this activity, you will use a 3D representation of the earth. This is a realistic representation, and because of the unique ability to navigate, the Arctic is represented appropriately.

2. Explore the Arctic in 3D

1. Open IGIMG_Scene_Latitude_Longitude.
2. Use the Navigation tools to examine the scene.



3. Examine the spacing between the latitude and longitude lines.

Q8 What countries are above the Arctic Circle?

Q9 What is below the Antarctic Circle?

Q10 What continent is closest in size to Greenland?

Q11 Is the Arctic represented correctly?

In this exercise, you have looked at map data in the Web Mercator projection and displayed it on a 3D representation of the Earth.