Swipe Map: Compare Graduation and Unemployment

Lesson Overview

In the effort to answer questions and solve real-world problems, it is frequently necessary to explore the relationship between different variables. For example, to answer a question about whether there is a relationship between diabetes and obesity, the investigator needs to compare the rates of these two conditions. Spatial data—data tied to a specific location—is essential in this. Mapping rates of diabetes and obesity reveals patterns of distribution that suggest a connection between the two. Beyond visual observations of patterns, exploring this data in a GIS means it is also possible to query the data and employ a range of analysis tools to further explore the relationships between them.

A swipe map provides a different way to compare maps and data. The swipe map enables users to interact with two web maps or layers simultaneously in a single scalable view. In this lesson you will create a swipe map to compare the percentage of the population that did not graduate from high school with unemployment rates. Data about educational achievement and employment is provided by the American Community Survey (ACS). ACS data is an ongoing survey that provides information on a yearly basis about the United States and its people. The ACS layers used in this exercise contain education levels and unemployment percentages by tract, county, and state boundaries. For this exercise, the relationship between population with less than a high school education and the employment rate will be compared.

How important is it for future members of the workforce to complete high school? What is the relationship between graduation rates and unemployment? A national education advocacy group focused on reducing high school drop-out rates has hired your data visualization company to produce a swipe map that compares the lack of a high school diploma with unemployment rates.

Builds skills in

- Accessing and using American Census Survey data
- Displaying data by quantities
- Creating a swipe map application

Software requirements

- ArcGIS Online account (get a free trial)

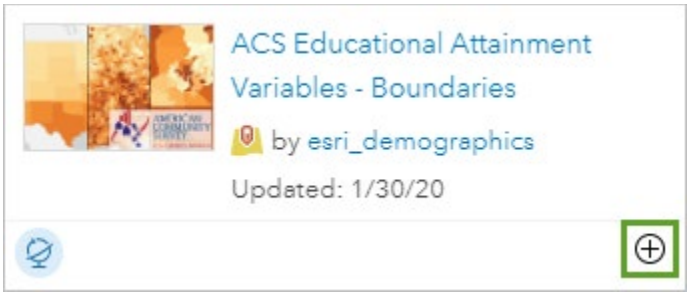
Estimated time

- 30 minutes to 1 hour

Exercise

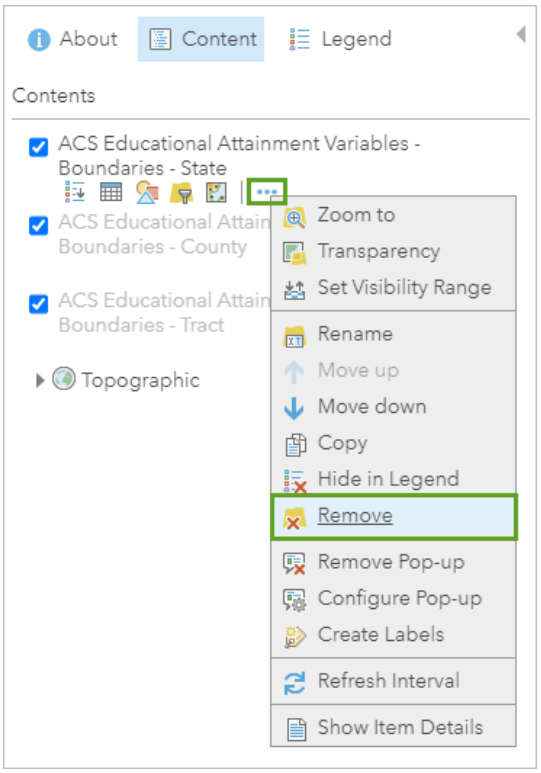
Step 1: Make an educational attainment map

1. Sign into your ArcGIS Organizational account.
2. Click the **Map** tab.
3. Click the **Add** button and click **Browse Living Atlas**.
4. Search for *ACS educational levels*.
5. Find the Educational **Attainment Variables – Boundaries layer** owned by esri_demographics and click and **Add** button.



6. Click the back arrow and click **Content**.

7. No analysis is to be done with the State Boundaries. Point to **ACS Educational Attainment Variables – Boundaries – State** and click the **More Options** button (three dots). Choose **Remove**.



8. Click **Yes, Remove Layer**.

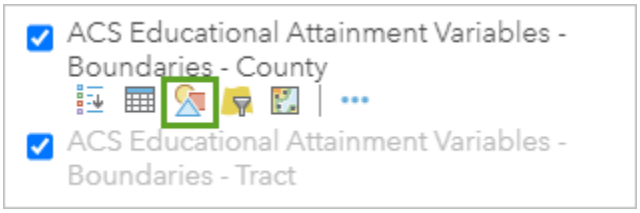
9. The **County** layer is not visible because it has a visibility range set so it can only be seen at certain scales. Click the **More Options** button for this layer and click **Set Visibility Range**.

10. Expand the visibility range to span between **World** and **Room**.

11. On the top ribbon click **Save** and **Save As**.

12. For Title, type *Education in the US*, followed by your name or initials. Add appropriate tags and a summary and click **Save Map**.

13. Point to the **County** layer and click the **Change Style** button.



14. Open the **Choose an attribute to show** menu. There is a lengthy list of attributes to choose from. You may want to enlarge the content pane by grabbing and dragging its right edge.

15. Choose the attribute **Percent of Population 25 Years and Over whose Highest Education Completed is Less Than High School**.

16. On the **Counts and Amounts (Color)** card, click **Options**.

17. Click **Symbols** and choose a dark to light red color ramp. If necessary, click the **Invert color ramp** button to make the top dark red and the bottom light red.

18. Click **OK**. Click **OK** again and click **Done**.

19. Under the **County** layer, click the **Show Legend** button.

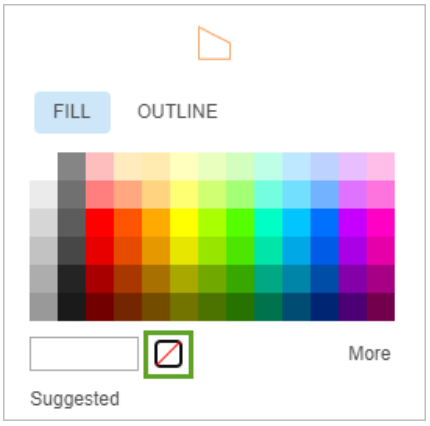
The counties that have a darker color have a higher percentage of population that has not completed high school. The map would be easier to interpret if state boundaries were shown.

20. Click **Add** and choose **Browse Living Atlas Layers**.

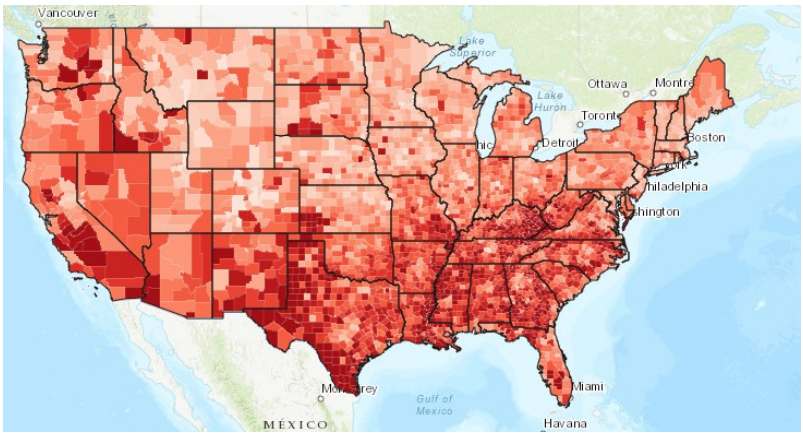
21. Search for and add the **USA States (Generalized)** layer owned by Esri.

22. Click **Change Style** and click **Options**.

23. Click **Symbols** and for **Fill**, click **No color**.



24. Change **Outline** color to black.



25. Save the map.

Step 2: Make an unemployment map

1. Click **New Map** and choose **Create New Map**.

2. Click **Add** and choose **Browse Living Atlas Layers**.

3. Search for *ACS employment* and add the layer **ACS Employment Status Variables – Boundaries** owned by esri_demographics.

4. On the **Contents** pane, remove the **State** layer.

5. Expand the visibility range of the **County** layer to span between **World** and **Room**.

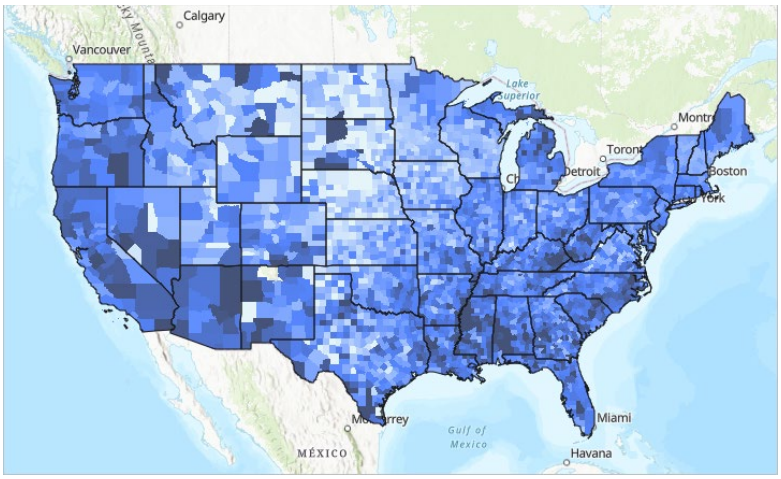
6. On the **County** layer, click **Change Style**. For **Choose an attribute to show**, make sure **Percent Unemployed** is chosen.

7. Change the symbol of the county layer to use a blue color ramp. Dark blue should be on the top of the color ramp and light blue should be on the bottom.

8. Click **Add** and choose **Browse Living Atlas**.

9. Add the **USA States (Generalized)** layer owned by Esri.

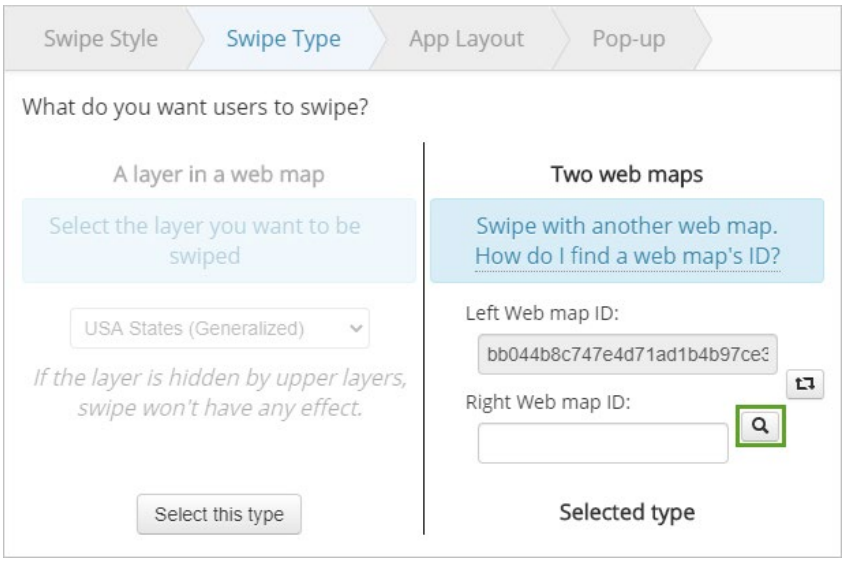
10. Change the symbol for the States layer to have no fill and a black outline.



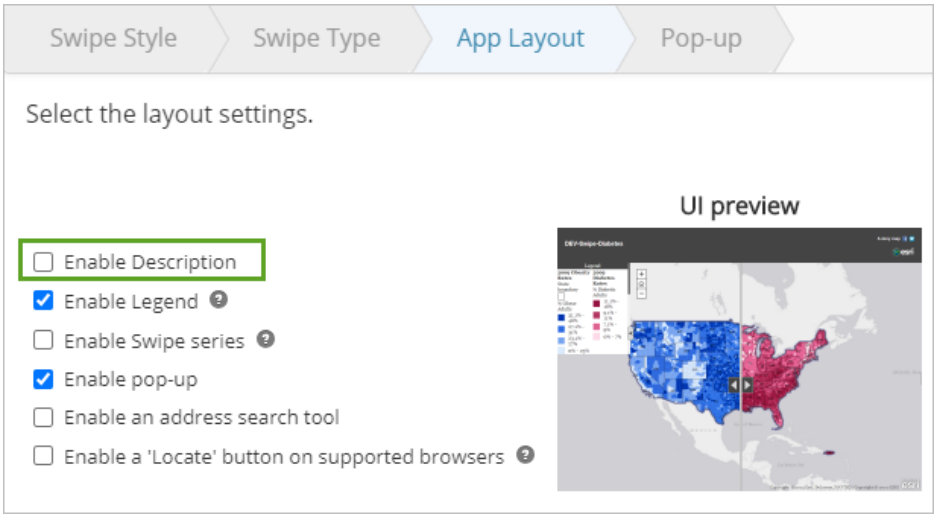
11. Save the map as *Unemployment in the US*, followed by your name or initials.

Step 3: Create a swipe map application

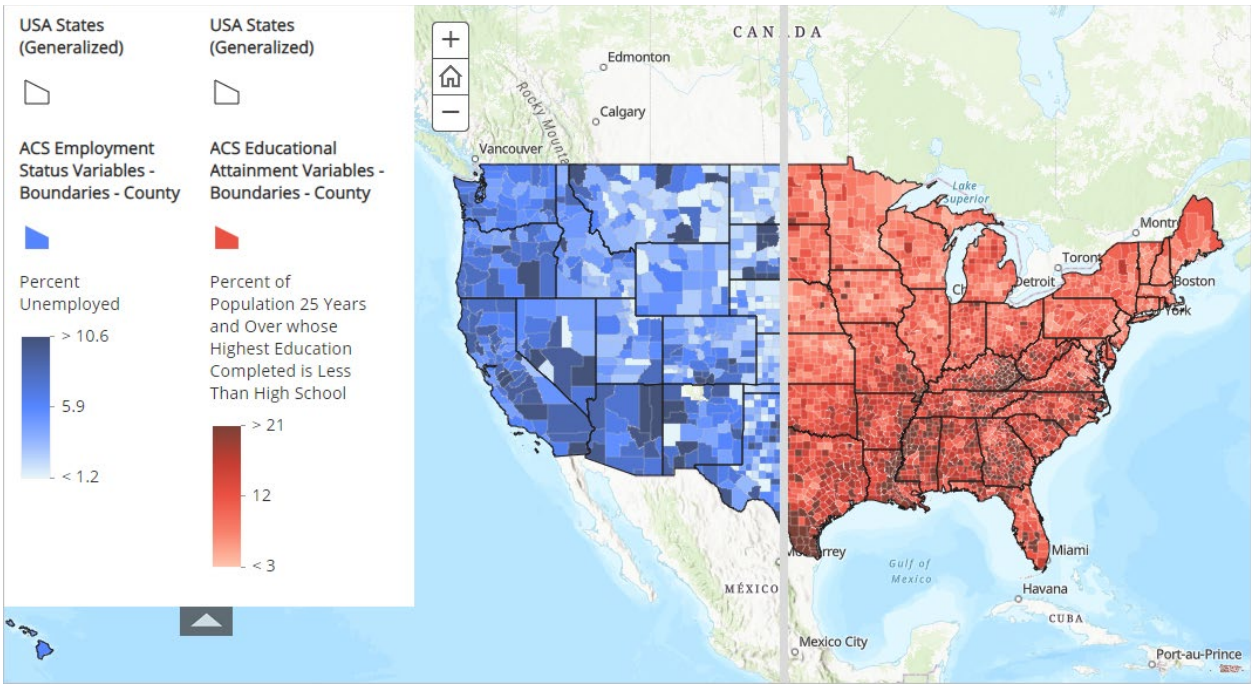
1. In the top-left corner, click **Home** and click **Content**.
2. Click **Create** and choose **Configurable Apps**.
3. Click the **Compare Maps/Layers** tab and choose **Story Map Swipe and Spyglass**. Click **Create Web App**.
4. For **Title**, type *Comparison of Education and Unemployment*.
5. Add appropriate tags. For **Summary**, type *Compare lack of a high school diploma to unemployment*.
6. Click **Done**.
7. In the **Welcome to the Swipe/Spyglass Builder** window, click the **Search** button.
8. Select your Unemployment map and click **Next**.
9. Select **Vertical bar** and click **Next**.
10. Select **Two web maps** and click the **Search** button next to **Right Web map ID**.



11. Choose your Education map and click **Next**.
12. Uncheck **Enable Description** and click **Next**.



13. For the **Left Map Header Title**, type *Percent unemployed*. For the **Right Map**, type *Percent of population 25 years and over whose highest education completed is less than high school*. Click **Open the app**.
14. Click **Save** and click **Share**. Choose to share with everyone or just within your organization.
15. In the **Share your story** window, click **Open**.



Q1. Use the swipe tool on the map to identify groups where both unemployment and the percent of adults without a high school diploma are high.

In this lesson you have used ACS data to map unemployment and educational attainment. You made a swipe map app to compare these two variables.

Assessment

Filter the **Tract** layer to a single county. Create a swipe map app to compare education and unemployment with the **Tract** ACS layer. Census tracts are small, relatively permanent statistical subdivisions of a county. Census tracts average about 4,000 inhabitants per tract.

Other swipe maps can be created using census and/or health data to explore possible relationships among variables, for example race and income, or infant mortality rate and poverty.

Exercise Answers

Q1. Use the swipe tool on the map to identify groups where both unemployment and the percent of adults without a high school diploma are high.

A1. There is a strong correlation in Mississippi, Alabama, Kentucky, Arizona, and New Mexico.

Esri License

380 New York Street

Redlands, California 92373 – 8100 USA

About the author

This lesson was written by a K-12 educator with support from the Learn ArcGIS team at Esri.

Support

If you have any questions about the lesson or need more support, please post them on the GeoNet community forum. We will reply with a possible solution.

Share your work

You can share your lessons and any other educational resources with us through our Learn ArcGIS Contributor program. Contact us with your idea.

https://learn.arcgis.com/en/educators