



## Geo Inquiry

Use the link below to explore lessons and maps available for many different subjects

<https://www.esri.com/en-us/industries/education/schools/geoinquiries-collections>

Suggestions:

### Lower Elementary:

Settlement Patterns: Explore the relationship between the location of surface water and U.S. population settlement patterns.

### Upper Elementary:

Where does the Water go (watersheds): Investigate regional and local watersheds and the effect that elevation plays on the movement of rainwater through the watershed.

Watersheds: Analyze major and local rivers and their watersheds

Settlement Patterns: Explore the relationship between the location of surface water and U.S. population settlement patterns.

### Middle School:

Last Drops

A River Runs Through It (Freshwater): Discover how water is gathered and travels to larger and larger watersheds to meet the sea

Remote Sensing: Students consider place-based hazards using remotely sensed data

### High School:

Last Drop: Explore the impact of human activities on water resources.



# Settlement patterns

from the Esri GeoInquiries™ collection for Upper Elementary

Target audience – Upper Elementary

Time required – 15 minutes

<b>Activity</b>	Explore the relationship between the location of surface water and U.S. population settlement patterns.
<b>Standards</b>	<p><b>C3: D2.Geo.2.3-5.</b> Use maps to explain relationships between the locations of places and regions and their environmental characteristics.</p> <p><b>C3: D2.Geo.6.3-5.</b> Describe how environmental characteristics influence population distribution.</p> <p><b>CCSS: ELA-LITERACY.RI.4.7.</b> Interpret information presented visually and explain how the information contributes to an understanding of the text in which it appears.</p>
<b>Learning Outcome</b>	<ul style="list-style-type: none"> <li>Students will analyze the relationships between surface water and population density.</li> </ul>

Map URL: <http://esriurl.com/fourgeoinquiry4>



## Engage

Does surface water location affect where people live?

- Ask students to brainstorm a list of reasons why people choose to live where they live. *[Answers may include jobs, recreational areas, natural resources, proximity to family, and educational opportunities.]*
- Open the map URL link above or type the URL into your Internet browser.
- ? What do the blue lines on the map represent? *[They represent rivers—one kind of surface water.]*
- ? What do the yellow dots represent? *[They represent large cities with more than 100,000 people.]*



## Explore

How many state borders are affected or created by surface water?

- Identify states that have a border formed by surface water—rivers or lakes. Hint: You can click on any state or feature to get its name. *[Examples include Washington, Idaho, California, Nevada, Arizona, Texas, Louisiana, Missouri, Iowa, Minnesota, Wisconsin, Kentucky, Illinois, Indiana, Ohio, West Virginia, Pennsylvania, Tennessee, and New York.]*
- ? What are some names of major lakes? *[Examples include the Great Lakes and Great Salt Lake.]*
- ? What are some names of major rivers? *[Examples include the Mississippi, Columbia, Snake, Ohio, Missouri, Colorado, Rio Grande, and Arkansas.]*

more ►

## Explain

What impact does surface water have on population density?

- ? What observations can be made about the location of water and large cities? *[Many large cities are located near surface water.]*
- Click the button, Show Map Contents.
- Click the check box to turn on the layer, USA Population Density.
- Click the button, Show Map Legend. Scroll down to see the USA Population Density legend.
- ? What settlement patterns do you notice on this layer? *[Answers may include: high-density areas are located around the outer parts of the country on coastal areas, and the interior sections of the country that are more densely populated are near bodies of water.]*
- Zoom in on the map to see Missouri and identify two areas of high population density.
- ? What do these two highly populated cities have in common? *[Kansas City and St. Louis are both located on the confluence of major rivers.]*
- ? What predictions can you make about why these cities were settled? *[Easier transportation routes for travel and trading, access to food supply, and natural barrier from attacks.]*

## Elaborate

How can high population density affect the surrounding surface water?

- Locate a body of surface water in your state.
- ? Does it look like the cities were settled around surface water? *[Answers vary based on geography.]*
- ? What are some potential negative effects of a large number of people living close to a body of water? *[Answers may include pollution by individuals and factories, and depletion of natural resources living in water (like fish, clams, and so on).]*
- ? What are some possible solutions to these problems? *[Answers may include responsible discarding of waste by individuals and factories, conservation efforts, and public awareness.]*

### TURN A LAYER ON AND OFF

- Make sure that the Details pane is turned on.
- Click the button, Show Map Contents.
- Show individual map layers, by clicking the box to the left of the layer name.
- Hint: If a map layer name is light gray, zoom in or out on the map until the layer name is black.

### IDENTIFY A MAP FEATURE

- Click a feature on the map, and a pop-up window will open with information.
- Links and images in the pop-up are often clickable.
- Hint: An arrow icon in the upper-right of the window indicates that multiple features have been selected. Click the arrow to scroll through features.

## Next Steps

**DID YOU KNOW?** ArcGIS Online is a mapping platform freely available to public, private, and home schools. A school subscription provides additional security, privacy, and content features. Learn more about ArcGIS Online and how to get a school subscription at <http://www.esri.com/schools>.

### THEN TRY THIS...

- Use this activity's map to investigate the Colorado River and the possible effects of high population density along sections of the river (in Arizona, Nevada, and California) in conjunction with a desert environment and the system of dams.
- Explore the 10 biggest cities in the world in the story map, *The Age of Megacities*, at <http://esriurl.com/Geo463>.



### TEXT REFERENCES

This GIS map has been cross-referenced to material in sections of chapters from these texts

- *States and Regions by Harcourt Brace* — Chapter 5
- *Regions of the United States by TCI* — Chapters 4, 5

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