

Infuse Spatial Thinking in Your Curriculum

eLearning Summit

August 1, 2018

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<https://z.umn.edu/elearningSpatial>



Plan for the Session

z.umn.edu/elearningSpatial

**Spatial
Thinking**

**Easy to use:
GeoInquiries
Story Maps**

Build a Story Map

**Wrap Up &
Questions**

Spatial Thinking: Cognitive Mapping

Form of human memory that uses the concepts of space, tools of representation, and processes of reasoning.

- Rearranging furniture in a room or move furniture through a doorway
- Assemble items on a shelf or bookcase
- Relate a map to the road ahead



Created by Adrien Coquet
from Noun Project



Spatial Thinking

Think of the house you grew up in, how many windows were on the first floor of your home?

In total?



Created by Pavel N.
from Noun Project

Spatial Thinking

“Spatial thinking is thinking that finds meaning in the shape, size, orientation, location, direction or trajectory, of objects, processes or phenomena, or the relative positions in space of multiple objects, processes or phenomena. **Spatial thinking uses the properties of space as a vehicle for structuring problems, for finding answers, and for expressing solutions.**”

-National Research Council. 2006

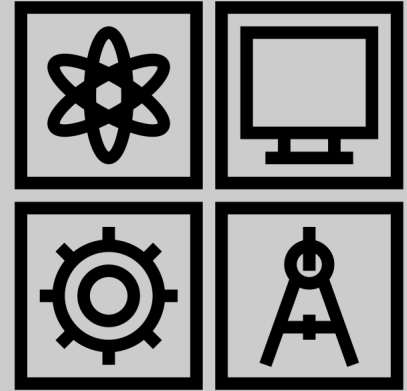
“One thing I’m learning is how to leverage spatial thinking to tackle real-world problems”

-Coleman Shepard, UMN MGIS student

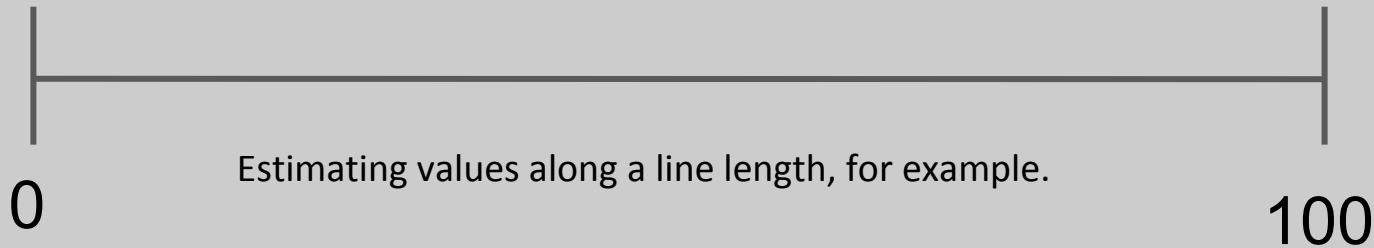


Spatial Thinking

Research is showing that early development of spatial thinking strengthens learning in STEM skills



Created by Eucalyp
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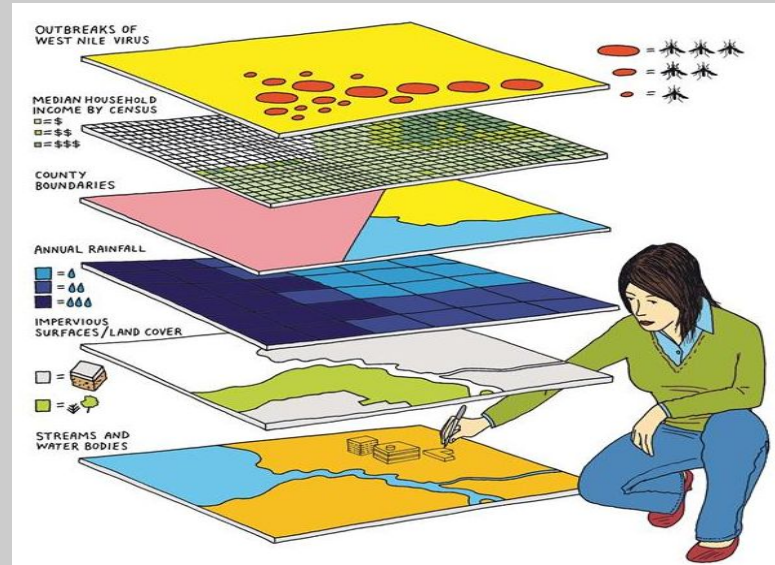
(<http://learnnow.org/topics/stem/spatial-meet-stem>)



Spatial Thinking

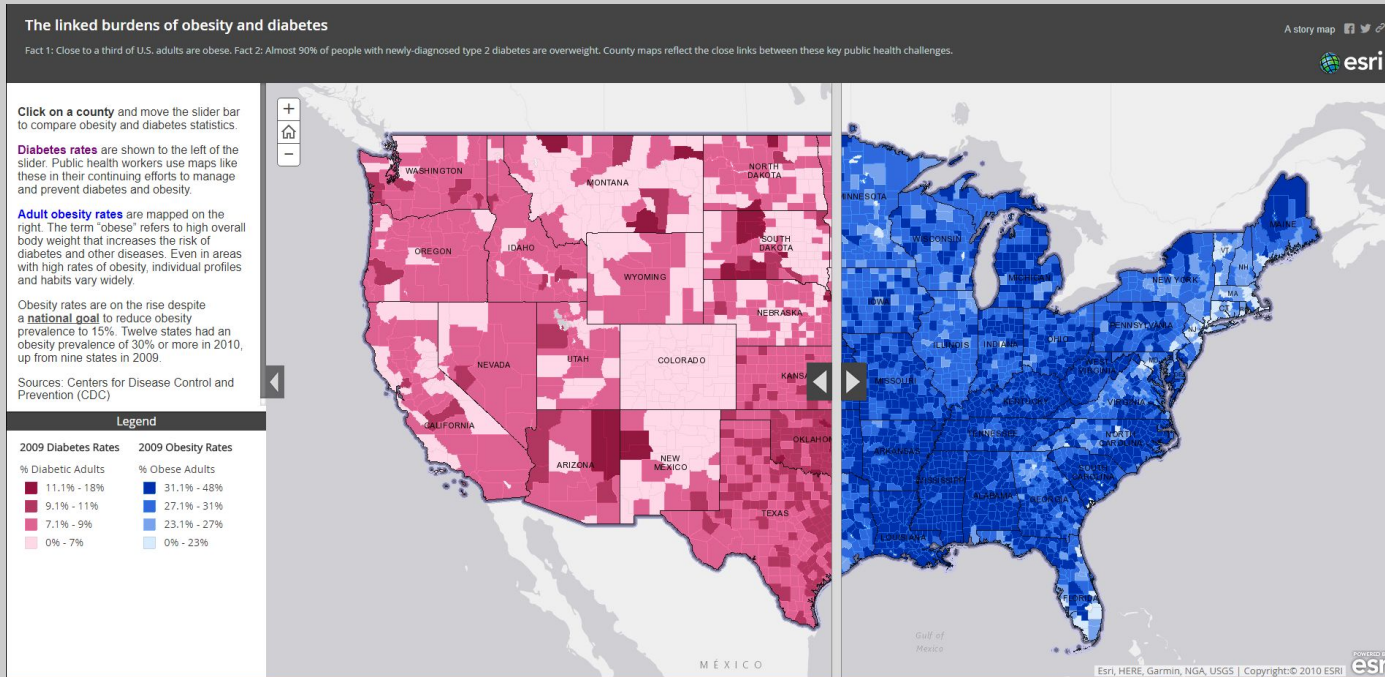
Maps provide an excellent way for students to think critically about the spatial relationships of geography.

West Nile Virus



Spatial Thinking

The Linked Burdens of Obesity and Diabetes



Geo Questions

Ask a Geo question:

- Where is it?
- Why is it there?
- Why should we care?

Geoinquiry Process

Geographic Inquiry Process



Geographic Inquiry Process



Step 1. ASK

Ask a question about spatial relationships in the world around you.

Geographic Inquiry Process



Step 2. ACQUIRE

Acquire geographic resources: identify data and information that you need to answer your question.

Geographic Inquiry Process



Step 3. EXPLORE

**Explore geographic data:
turn the data into maps,
tables, and graphs, and
look for patterns and
relationships.**

Geographic Inquiry Process



Step 4. ANALYZE

Analyze geographic information: determine what the patterns and relationships mean with respect to your question.

Geographic Inquiry Process



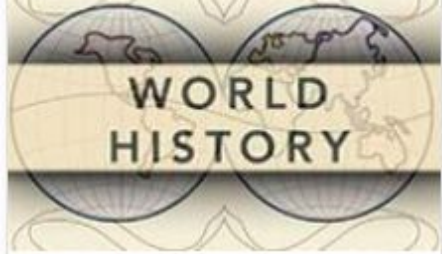
Step 5. ACT

Act on geographic knowledge: use the results of your work to educate, make a decision, or solve a problem.

Two Easy Resources

- [GeoInquiries](#)
- [Story Maps](#)





[GeoInquiries](#) are short, standards-based inquiry activities for teaching map-based concepts found in commonly used textbooks.



Story Maps

[Story Map Gallery](#)

- [Storm Water A-Go-Go](#)
- [Embattled Border](#)
- [Water on Mars](#)
- [Lincoln Assassination](#)
- [Change from Above](#)

Esri ArcGIS Online



- Cloud Based GIS Service
- Easy way to add, store, and visualize spatial data
- Analyze data
- Emphasis on content sharing
- User has control of data security
- Public and subscription versions exist



ArcGIS Online Subscription

- Subscription accounts for education institutions
 - K-12 Institutions have [free access to ArcGIS](#) through ESRI. See if you have an organizational account through your school or request one.
 - UMN/MN State Colleges has a subscription that is available for Students, Faculty and Staff
 - “Subscription” accounts for organizations start at \$2,500/year for 5 users, include numerous additional functions



Resources

- [GeoInquiries](#)
- [Esri Story Maps](#)
- [ESRI's K-12 License](#)
- [Teach with GIS: An Implementation Guide for Teachers, Schools, and Districts](#)
- [Book: Learn to Think Spatially \(2006\)](#)
- [Thinking Spatially Using GIS](#)
- [MN Spatial Data Resources](#)
- [U-Spatial Map Prize](#) (see the 2018 award winning Story Maps!)



Questions?



Created by Gregor Cresnar
from Noun Project

