

An Introduction to Geographic Information Systems (GIS)

21st Century Technology for Creativity
and Problem Solving

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Abstract

The interactive and hands-on session, will introduce you to the basics of GIS. The session will also show you how to get a free GIS software license for your classroom.

Past student and teacher projects can be viewed at the state GIS website called- NEEDGIS:

<http://needgis.maps.arcgis.com/home/index.html>

Objectives

- Give participants an idea of what GIS is and the uses and applications of GIS for K-12 classes.
- Have participants practice using GIS pre-made maps, and become familiar with how to use data to make maps of their own.
- Provide resources and information on how participants can incorporate GIS into their own classrooms, schools, or districts.

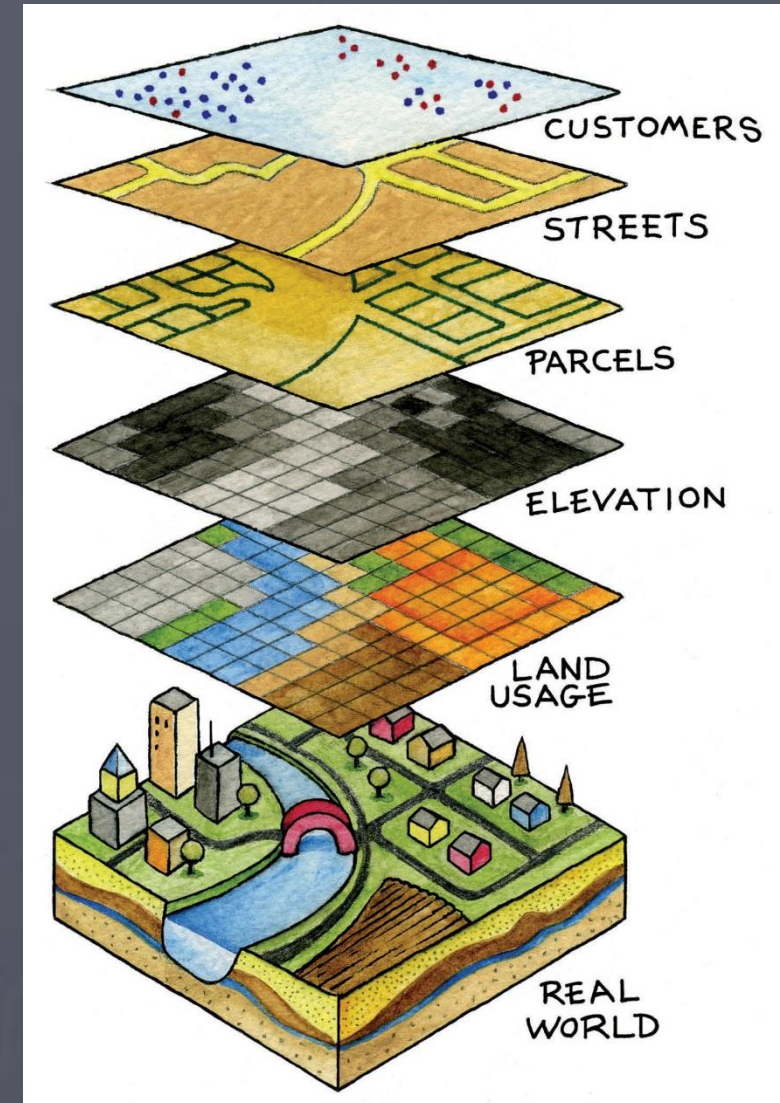
Anticipatory Set

- Real time mapping!
- <https://survey123.arcgis.com/share/0e5ca893fb5b410c983827da455a6b40>



Explaining GIS

- GIS uses computer programs to collect, store, analyze, and share geographic data
- Geospatial Technologies allow users to view relationships and identify patterns more easily with different layers



Esri Gallery

My Maps Gallery


[Index 2](#) [Index 3](#) [Group ID Finder](#)

Maps and Layers


Available Maps (Grid View)




Grants for Health ...



Prime Imagery Extended



Precipitation and ...



Annual Deaths per 1000




Election Results Canada



Social Services N. ...



Parks & Gardens in Paris



Pakistan Flooding



Shipwrecks Western ...

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Layers

Find worldwide layers usable in ArcGIS including:

- Earthquake Centers Yukon Territory Canada
- Ecosistemas Terrestres de Paraguay
- Global Forest Watch
- Frontier Forests
- Hamburg (Topographische Karten, Orthofotos)
- Marine Biodiversity
- Priorities in Mexico
- Mineral and Oil Extraction
- Dependent Economies
- Natural and Artificial Lakes of the World
- New Zealand Gazetteer
- River and Stream Network of Australia
- Vegetation Savannas of Zambezi Area

1 2

<http://www.arcgis.com/home/gallery.html>

Unpacking the Standards – Common Core

- CCSS.ELA-LITERACY.RH.9-10.7
Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.
- CCSS.ELA-LITERACY.RH.11-12.7
Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem.
- CCSS.ELA-LITERACY.RST.11-12.9
Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

GIS Experiences

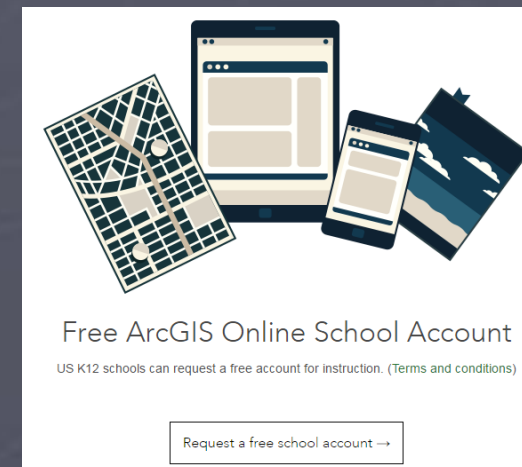
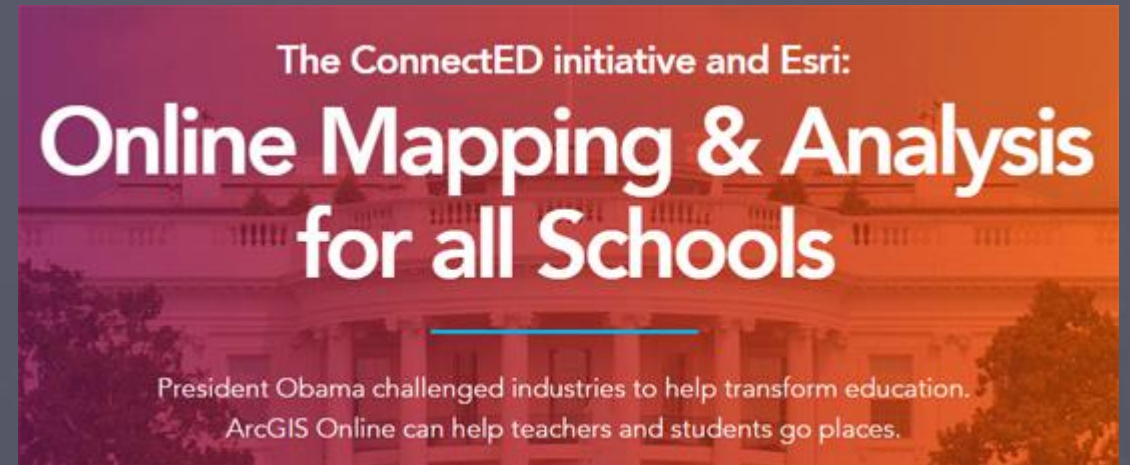
- GIS Projects offer great opportunities to partner with businesses and local government to give students real-world experience and ideas on application
 - **ST1.10** Community, post-secondary, business/industry partners and/or families actively support and are engaged with teachers and students in the STEM program.
 - **ST1.11** Students are supported in their STEM learning through adult-world connections and extended day opportunities.
 - Student Example

Suggested Students

- GIS can be incorporated into just about any class. It especially opens up the possibilities for cross-curricular projects.
 - **ST1.1** The STEM school/program supports non-traditional student participation through outreach to groups often underrepresented in STEM program areas.
- There is a bit of a learning curve with GIS
 - Use the [ArcGIS Online Skill Builder](#) for an idea of what type of skills are required for GIS and to decide what types of activities to incorporate in with your students

Esri's ConnectED Initiative

- Esri has provided \$1 Billion worth of free access for K-12 Institutions to ArcGIS Online
 - Renewed through 2019
- Institutions can sign up for free institutional accounts
 - Given 1,000 credits to use that can be refreshed annually
- Esri has also developed pre-made lessons for Geography, US History, Earth Science, Environmental Science, and 4th Grade Interdisciplinary classes
- www.esri.com/connected



Getting Started

Get Training

- Biggest challenge to beginning a course is getting teachers with appropriate training
 - Esri Mooc Lessons
 - Esri Training

Suggested Setup

- Computer Lab or Bring Your Own Device
 - ArcGIS is Cloud Based
 - A computer with a mouse is recommended

Connect with a GeoMentor

- GeoMentor program allows teachers to connect with local GIS experts
 - Technical help
 - Ideas for projects and community integration
 - <http://www.aag.org/geomentors>

Integrative Learning:

- GIS can be used in any subject area
- In STEM the idea of project based real-world learning matches with the capabilities of GIS
 - Below are three examples of GIS Learning Environments that focus on an integrative project based real-world learning experience



Learn ArcGIS



Additional Geospatial Technologies



GIS Based Apps

- Snap2Map – AppStore and itunes Store
- Survey123 <https://survey123.arcgis.com/>
- Snap2Data – AppStore and itunes Store



Hands On Activity

- Go to www.geographyforgeographers.com and open the link to the Nebraska Association for the Gifted page on the homepage
- Download the Minnesota Wild Draft Picks from the page
- Sign into www.arcgis.com
 - Username: Workshop1OPS
 - Password: Workshop14!

Contact

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