



Unlocking the Magic of GIS for use with STEM

**Will Davis, GISP
Operations, Lake County Schools**



Pondering Question:

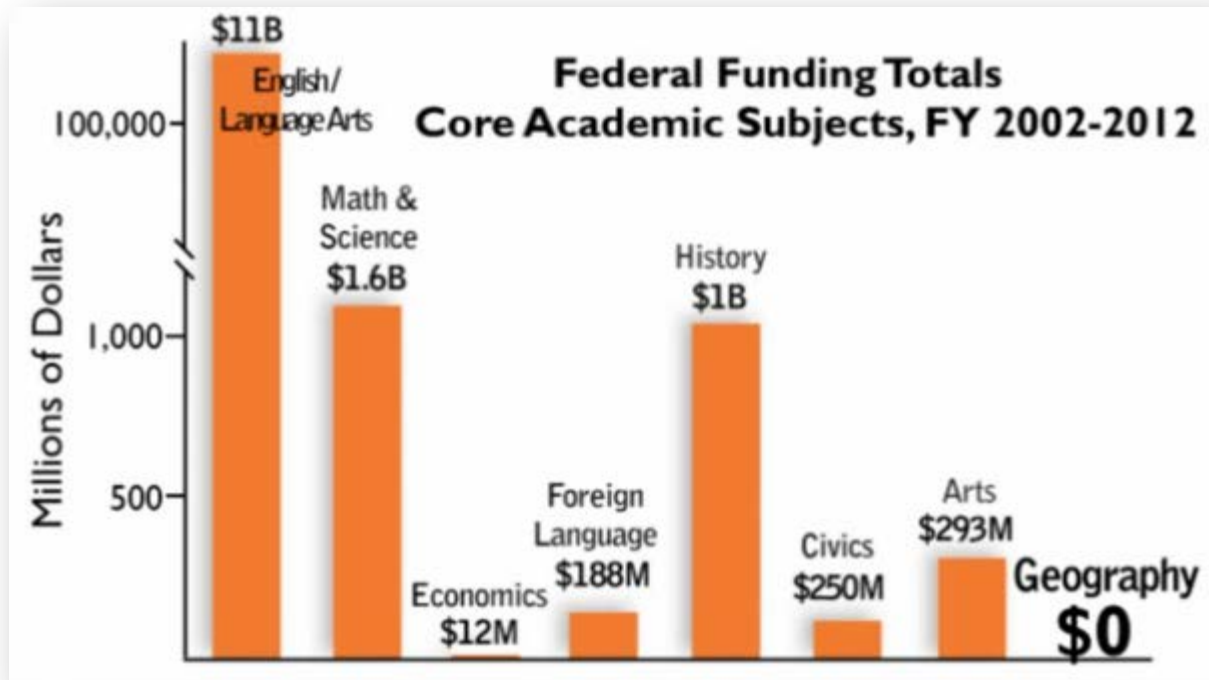
What is GIS and why is it important in education?



STEM:
Science
Technology
???????
Engineering
Mathematics



Federal Funding of Core Academic Subjects



STGEM:

Science
Technology
Geography
Engineering
Mathematics



Question - Part 1:

What is GIS?



Geographic Information Systems

GIS is an abbreviation for geographic information systems which is a set of tools that captures, stores, analyzes, manages, and presents data that are linked to locations. In the simplest terms, GIS is the merging of cartography, statistical analysis, and database technologies to develop better solutions and make better decisions.



Geospatial Technology from Penn State University (Geospatial Revolution Project)

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Episode 3: Full Episode (15:02 minutes)

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- Chapter 2: Waging Modern War
- Chapter 3: Serving & Protecting
- Chapter 4: Staying Safe

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THE PROJECT FOR EDUCATORS RESOURCES FOR PRESS/PROMOTIONS



How does GIS fit into STEM?

- Critical thinking
- Cross-disciplinary problem solving
- Academic to real-world concepts
- Pathway for deciding best solutions
- Problem-based learning (PBL)
- Motivation with technology
- Builds workforce ready skills
- Growing demand in job market



Student Motivation with Technology



“I’ve rarely seen 100% engagement in any lesson activity as I have with ArcGIS Explorer Online. It was a great success!”

**Diane Reid-Goolsby,
6th Grade Geography Teacher
Tavares Middle School**



What are the components of GIS?

- **Hardware**
computers, printers, servers
- **Software**
programs, applications
- **Data**
information, tables,
spreadsheets, databases
- **Methods**
how to ask questions
- **People**



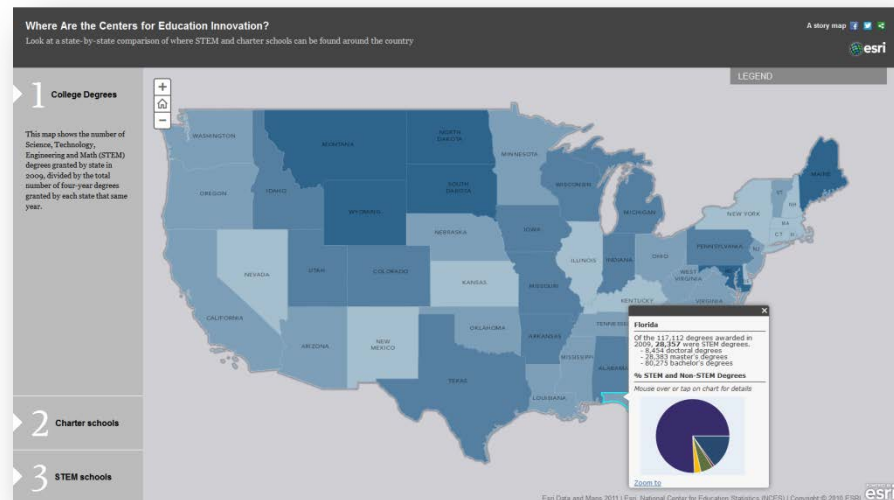
Infrastructure Requirements

- Computer hardware
- Network connectivity
- Educator knowledge & experience
- Circulum materials available
- Acquired an educational site-wide license
 - +30 license platforms with unlimited use
 - Desktop, server, tablet & smartphone platforms
 - Mobile (IOS, Windows Mobile & Android)
 - Business & community analyst applications
 - Cloud-based applications with ArcGIS Online

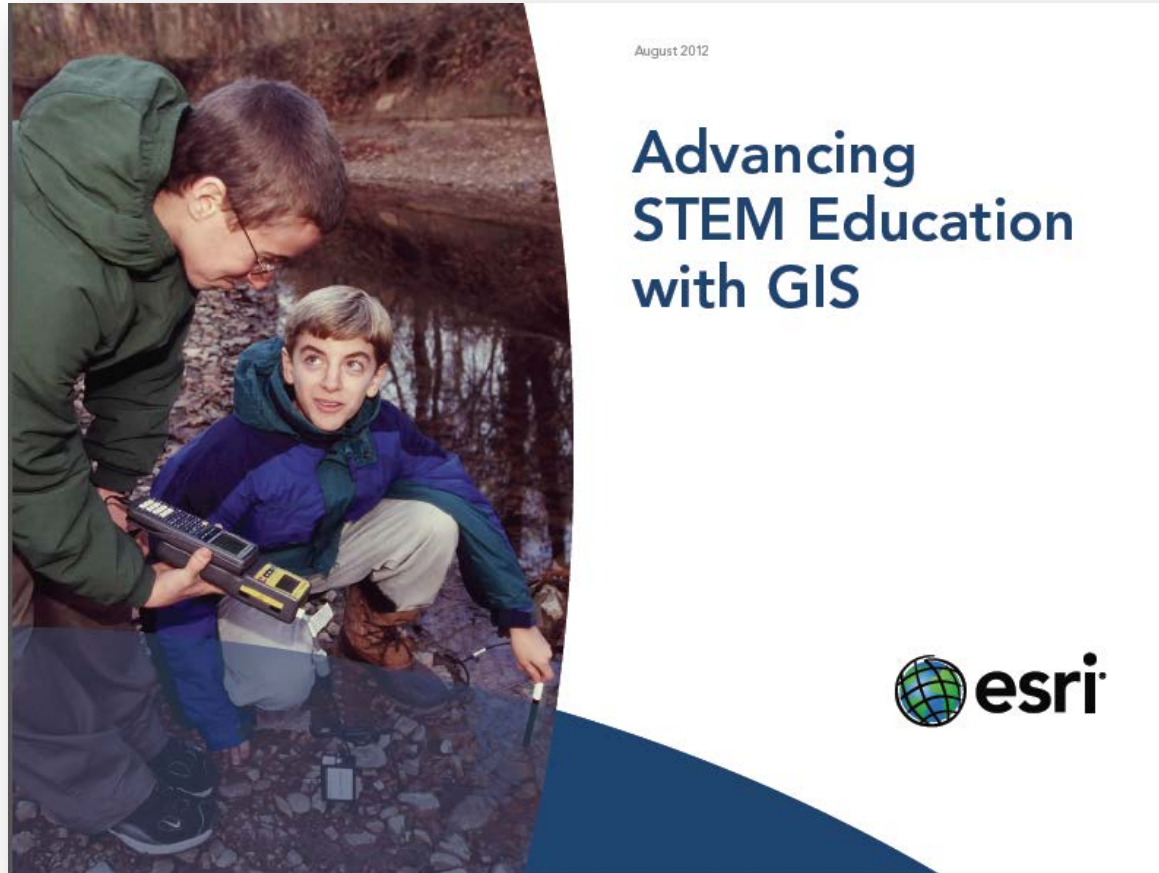


Infrastructure Requirements

- Circulum & informational materials available
 - National Science Foundation (NSF)
 - U.S. Geological Survey (USGS)
 - National Geographic Society – Geo-Literacy Project
 - Institute for the Application of Geospatial Technology (IAGT)
 - GIS & Science Blog
 - ESRI or GIS.com
 - GIS2GPS Portal
 - Slideshare
 - District's site



Moving the Bar Forward



Question – Part 2:

**Why is it important?
(to student learning & success)**



Geo-literacy

from National Geographic

(Preparing for Decision-Making in the 21 Century)

The screenshot shows the National Geographic Education website. At the top, there is a navigation bar with links for 'About Us', 'Connect With Us', 'FAQ', and 'National Geographic Home'. Below this is the 'education' logo and a search bar. The main content area features a video player with the title 'Why is Geo-literacy Important?' and a subtitle 'Prepare for Decision-Making in the 21st Century'. The video player shows a person riding a bicycle on a dirt road in a desert landscape. To the right of the video player, there are sections for 'Key Concepts' (geo-literacy, geography, future education decisions), 'Related Materials' (Do More With This Resource, Find More Resources), and 'Background Info' (Questions, Vocabulary). The 'Background Info' section contains text about the importance of geo-literacy in a modern, globally interconnected society.

NATIONAL GEOGRAPHIC
education

About Us | Connect With Us | FAQ | National Geographic Home

Teachers | Informal Educators | Families | Students | Kids

Teaching Resources | Reference and News | Mapping | Media | Collections | Get Involved | Geo-literacy

Video
MEDIA SPOTLIGHT

Why is Geo-literacy Important?

Prepare for Decision-Making in the 21st Century

Key Concepts
geo-literacy geography
future education decisions

Related Materials
Do More With This Resource
Find More Resources

Background Info | Questions | Vocabulary

In our modern, globally interconnected society, it is more important than ever that people understand the world around them. The introduction of high-yield, low-impact agricultural practices, early-warning systems for national defense and natural disasters, and the preparedness of our children to have systemic understanding, geographic reasoning skills, and systematic decision-making capability are crucial for our society. Geo-literacy can reduce the costs of bad decision-making and provide the foundation for positive breakthroughs. For these reasons and more, National Geographic is committed to advancing geo-literacy in the United States and



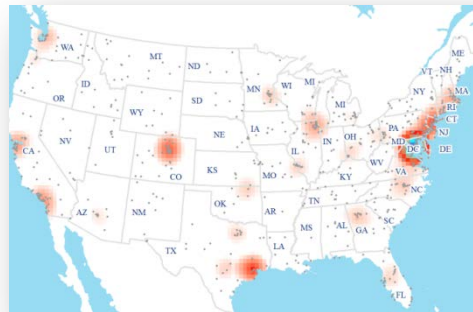
Learning Important Skillsets

- Critical thinking
- Cross-disciplinary problem solving
- Connects STEM's focus disciplines
- Real-world concepts
- Pathway to best solutions
- Problem-based learning (PBL)
- Great motivational tool
- Involves latest technology



What is the GIS Job Market?

- Industry grew by double digits in early 2010's
- Is considered a "high growth industry" (*Dept. of Labor*)
- Expected annual growth of 35% each year through 2020
- Florida was 4th of top 10 job postings states in GIS
- Can earn an annual salary of up to \$70,000
- GIS Analyst (Information Technology Sector) rank in top 100 of Best Jobs in America (*CNN Money*)
- Diversity of available jobs based on all educational levels

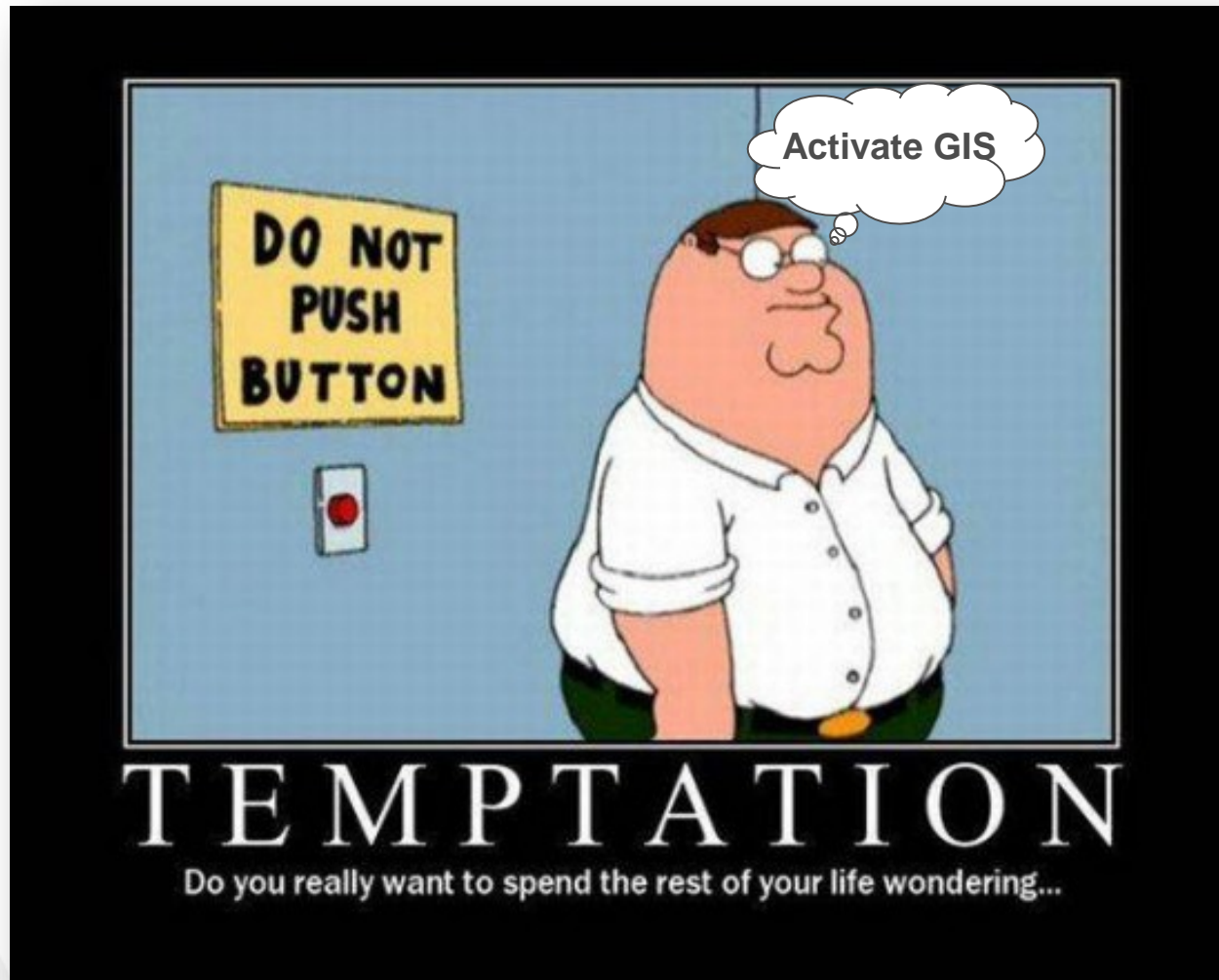


Types of jobs that use GIS

- **Computer Science**
- **Electric/Gas Utilities**
- **Business/Marketing**
- **Telecommunications**
- **Transportation Logistics**
- **Petroleum & Mining**
- **Engineering**
- **Water & Wastewater**
- **Health Care**
- **Federal Government**
- **Economics**
- **Environmental Mgmt.**
- **Local Government**
- **School Districts**
- **Geology**
- **Military/Intelligence**
- **Archeology**
- **Sociology**
- **Community Planning**
- **Real Estate & Cadastral**
- **Agriculture**
- **Forestry**
- **Public Safety**
- **Risk Management**
- **Aerial Photography**



Presentation Takeaway



Questions



Contact & Presentation Information

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