



Integrating Geospatial Technology into 7th Grade Science

Baboquivari Unified School District #40
Baboquivari Middle School
Tohono O'odham Nation
Sells, AZ

By Bridget Valenzuela

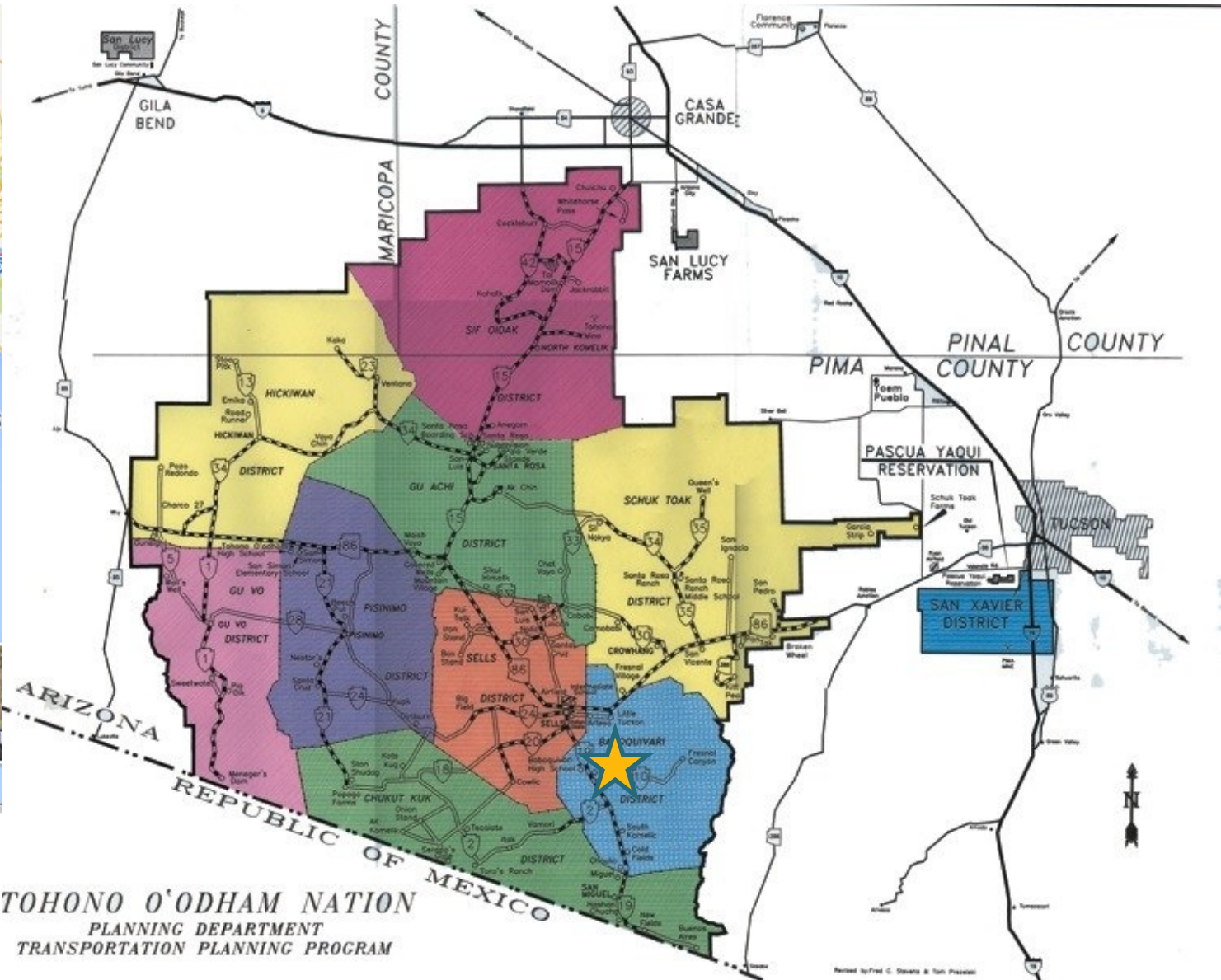


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Class Size and Target Dates

- Three 7th grade science classes.
- Average of 26 students per class

TOPIC	TIME FRAME	METHOD
Rock Types	September	ARCGIS Online
Volcano Types	December	StoryMaps
Astronomical Sites	March	StoryMaps
Climate Change	May	ARCGIS Online



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Why Teachers?

- Integrate technology
- Broaden inquiry learning
- Promote critical thinking
- Career and college ready



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Objective Statement

- The objective of my lesson plan is for students to manipulate, analyze, create, and visually interpret geospatial data to determine the rock composition layers of the Tohono O'odham Nation by village using ArcGIS Online.
- GIS lessons will be focused on Earth science, plate tectonics, local geology and ecology.



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Learning Outcomes

Students will be able ...

- to compare and contrast rock compositions of igneous, sedimentary, and metamorphic rocks of Arizona tribal lands using the rock cycle.
- to differentiate rock types from their texture, color, and crystal size.
- to use geospatial sciences in relation to inquiry and analysis.



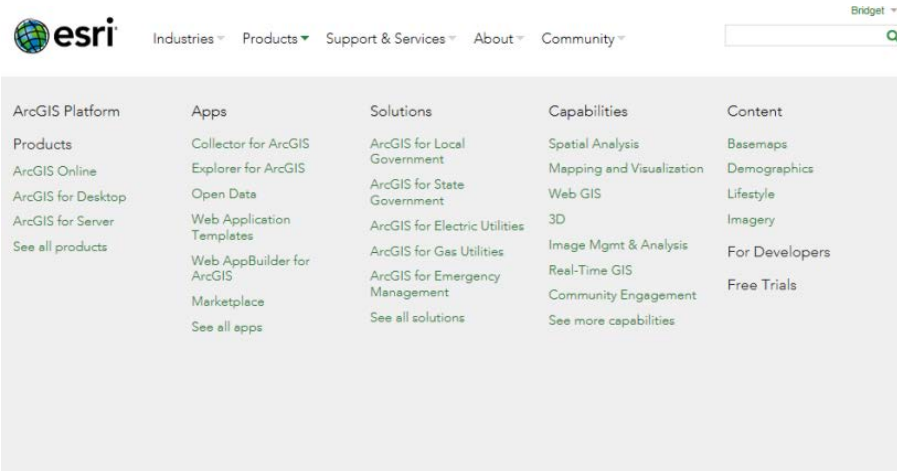
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Tools for GIS in the Classroom



The screenshot shows the Esri website's navigation menu. At the top is the Esri logo and a search bar. Below are links for Industries, Products, Support & Services, About, and Community. The main content area is divided into five columns: ArcGIS Platform, Apps, Solutions, Capabilities, and Content. Each column lists various products and services available.

ArcGIS Platform	Apps	Solutions	Capabilities	Content
Products	Collector for ArcGIS	ArcGIS for Local Government	Spatial Analysis	Basemaps
ArcGIS Online	Explorer for ArcGIS	ArcGIS for State Government	Mapping and Visualization	Demographics
ArcGIS for Desktop	Open Data	ArcGIS for Electric Utilities	Web GIS	Lifestyle
ArcGIS for Server	Web Application Templates	ArcGIS for Gas Utilities	3D	Imagery
See all products	Web AppBuilder for ArcGIS	ArcGIS for Emergency Management	Image Mgmt & Analysis	For Developers
	Marketplace	See all solutions	Real-Time GIS	Free Trials
	See all apps		Community Engagement	
			See more capabilities	

- ESRI Products
 - ArcGIS Online
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 - StoryMAP



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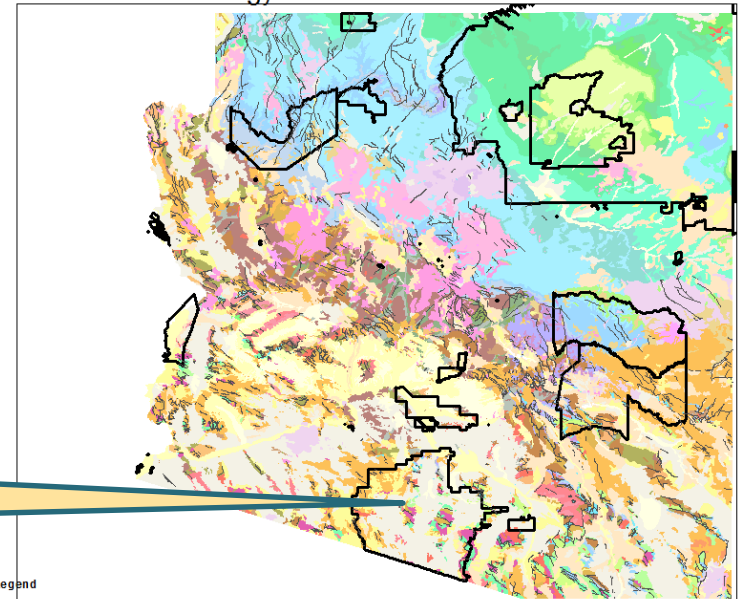
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Methodology - ArcGIS Online

- Students will create a map consisting of 3 – 4 ESRI layers.
- Then analyze and interpret data.

Tohono O'odham
Nation

Geology of Arizona Tribal Lands



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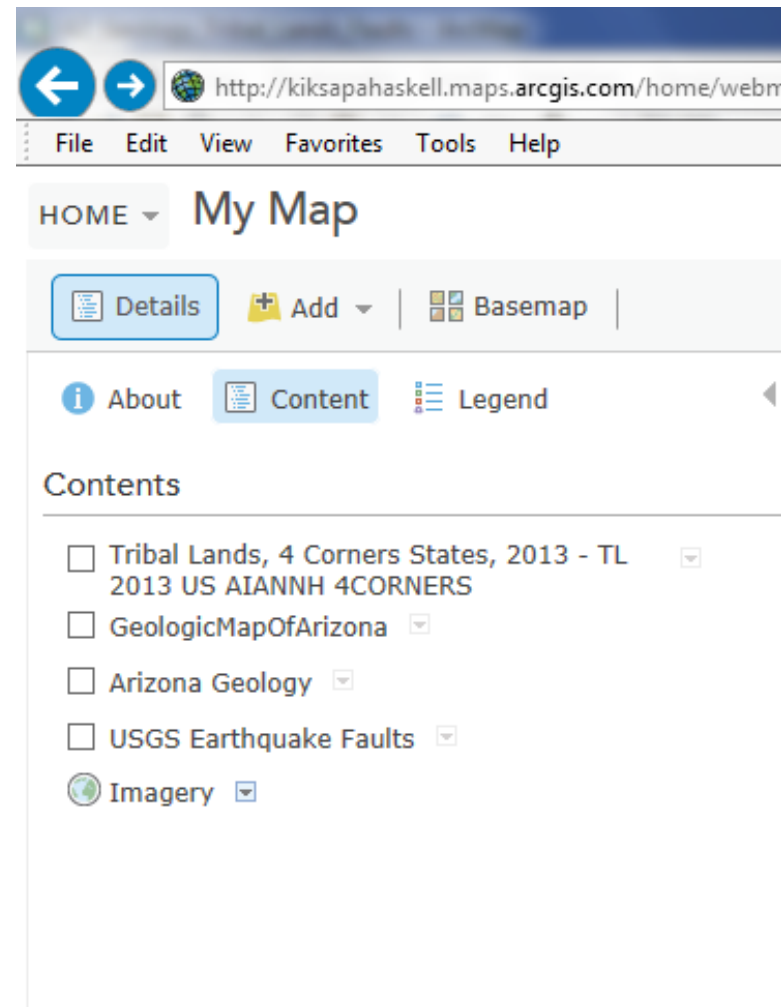
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Methodology - ArcGIS Online

ArcGIS - ESRI

- Base Maps:
 - Imagery
- Layers:
 - Tribal Lands, 4 Corners, 2013-TL
2013 US AIANNH 4CORNERS
 - Geologic MapOfArizona
 - USGS Earthquake Faults
 - Arizona Geology
 - Tohono O'odham Nation district
shape file



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Analysis of Questions

- Compare and contrast the composition of rock types between two different AZ reservations.
- Which came first: igneous, metamorphic, or sedimentary rock?
- What is a rock? How can rocks be classified?
- What is a mineral? How can minerals be classified?



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Story MAPS – Volcano Criteria

- Volcano Type
- Picture
- Last Eruption
- Eruption Type
- Cultural Significance
- Picture

Sunset Crater, AZ



Sierra Negra, Galapagos



Kilauea, Hawaii



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Project Based Activities

- Identify cultural significance of various minerals or rocks throughout Tribal Lands
- Desert pictoglyphs using satellite imagery
Coyote tracks in the desert



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Questions



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