**Engage Students in Social Studies by Reaching Out to the Science Teacher** Across the Hall

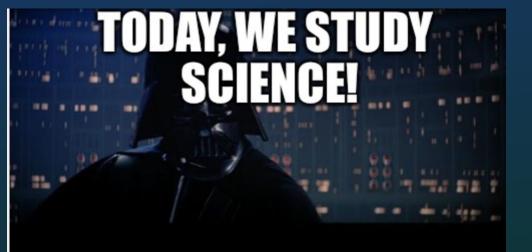
> Shannon Salter (the social studies teacher), Building 21 High School, Allentown, PA

Ian Hanson (the science teacher) Alexis I DuPont High School, Wilmington, DE

#### Getting to know you:

 Change your name to give us your first name, grade and subject taught

 Using chat, describe one way you have incorporated a science topic in your social studies instruction (it's ok if the answer is "never!")



# NO...I WANT TO STUDY SOCIAL STUDIES!

imaflip.com

#### **ONE DOES NOT SIMPLY**

#### **IX SOCIAL STUDIES AND SCIENCE**

Reasons why science is missing from social studies classrooms

- It's someone else's job!
- If I knew science I wouldn't be a social studies teacher!
- I get that science has influenced human events, but I don't feel comfortable to talk about it!
- Science-based policy has become too controversial
- I don't have time to plan something from scratch

Can you think of times when public policy debates were dependant upon the public's understanding of science?

(use the chat)

What happens when STEM and Humanities don't work together?

*"Virus Experts Aren't Getting the* 

<u>Message Out</u>"

The Atlantic, May 6, 2020

# What does Science need from Social Studies?

lan?

Social Studies is how learning leaves the classroom!

Let's look at this example, combining environmental science with civics...

# NCSS C3 Framework:

#### BY THE END OF GRADE 12

**D2.Geo.4.9-12.** Analyze relationships and interactions within and between human and physical systems to explain reciprocal influences that occur among them.

**D2.Geo.5.9-12.** Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions.

**D2.Geo.6.9-12.** Evaluate the impact of human settlement activities on the environmental and cultural characteristics of specific places and regions.

# Just Ask Linda Monk:

,Υ.

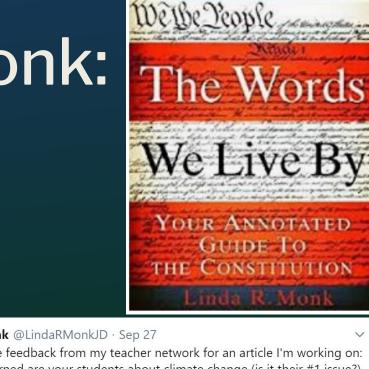




Linda Monk @LindaR... · 10/7/19 V Opinion | World leaders are failing our future generations on climate change



Opinion | World leaders are failing our future generations... washingtonpost.com





Linda Monk @LindaRMonkJD · Sep 27 Need some feedback from my teacher network for an article I'm working on: how concerned are your students about climate change (is it their #1 issue?) and how do you address it in class? Thanks!



 $\mathcal{O}$  7

**^** 



Linda Monk @LindaRMonkJD · Oct 11

176

For Ts who want to integrate civic action and climate change, here's a fieldtested curriculum, along with a T who can answer Qs. eli.lehigh.edu/sesi



Replying to @LindaRMonkJD

I'll be at PCSS with this work next Friday. Our team will also be at CUFA and NCSS in November. Our sessions are on other work, but we'd be happy to talk to people.

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## <u>Let's Watch Students</u> <u>Change Their World!</u>

#### Promoting Geospatial Technologies with Socio-Environmental Science Investigations

Shannon Salter<sup>1</sup>, Alec Bodzin<sup>2</sup>, Tom Hammond<sup>2</sup>, Ian Hanson<sup>1</sup>, William Farina<sup>2</sup>, Robson Junior<sup>2</sup>, Qiong Fu<sup>2</sup>, Kate Popejoy<sup>3</sup>, David Anastasio<sup>2</sup>, Breena Holland<sup>1</sup>, Dork Sahagian<sup>1</sup>, and Scott Rutzmoser<sup>1</sup>,

> <sup>1</sup>Building 21 High School, Allentown, PA , <sup>2</sup>Lehigh University <sup>3</sup>Popejoy STEM, LLC





#### **About Our School**

- 4 teachers of 9<sup>th</sup> grade students
  urban public school
- All students economically disadvantaged
- 2/3 Hispanic or Latino
- 21% ELL, 19% IEPs
- Many (~10-20%) are unengaged learners
  - **Do not complete tasks**
  - Avoid challenging work

#### Sequence of activities

Investigation topics (can be flexibly sequenced):

- Observing: Ecology, built environment (Sci & SS)
- Trees & ecological services (Sci & SS)
- Urban Heat Islands (Sci)
- Zoning (SS)
- Built Environment activity (**SS**)
- Transportation (sci & SS)
- Carbon sequestration lab (sci)

Project topics

- Tree planting
- Culminating project (urban planning for social, environmental, & economic sustainability)





**S** 

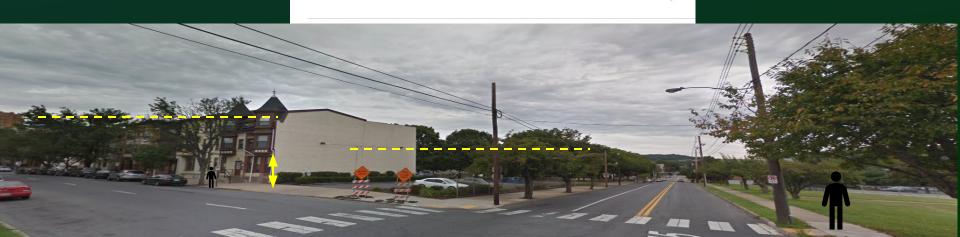
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Locatio						
98.4 ft Tree_Observation:						
Tree Type Deciduous (lea	ves)		>			
Genus			>			
Species			>			
Origin native			>			
Height meters			>			
Circumference cm			>			
Notes or Observation	ons		>			

# **TES** Data Gathering Interface





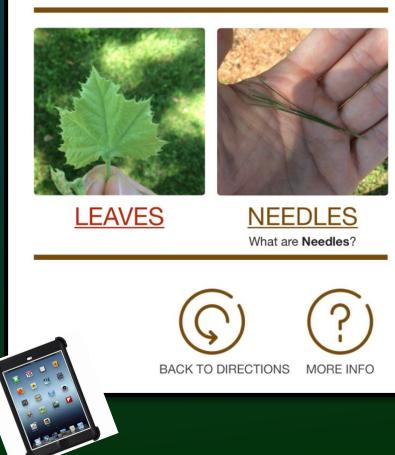
#### **Book** pages

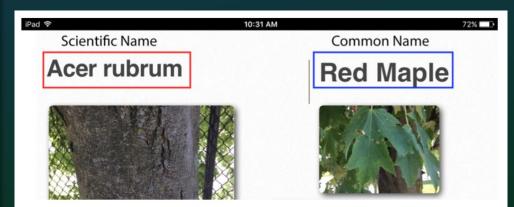
72% 🕞 🗈

#### Does the tree have needles or leaves?

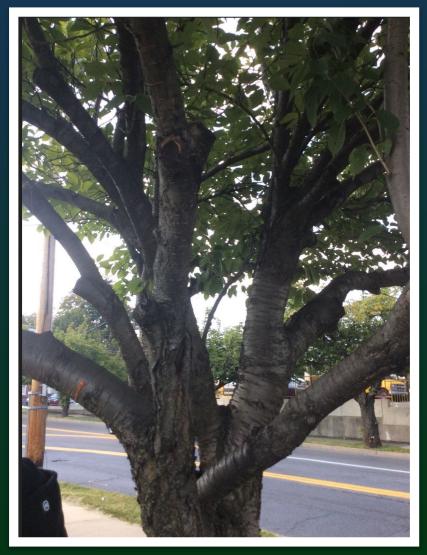
iPad 穼

10:22 AM





#### **Student Photo**





#### Mentors

#### Tree Observations: Kwanzan Cherry

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Tree Type	Deciduous (leaves)		
Genus and Species	Prunus kwanzan		
Common Name	Kwanzan Cherry		
Origin	native		
Height meters	6		
Circumference cm	150		
Notes or Observations	Mid sized tree alternative leaves		

multiple stumps

Attachments: Zoom to Get Directions



# Student Data

# Home 🗵 Trees and Ecological Services Classroom Map - All Blocks 🥒 New Jsing 🖥 Save 👻 📟 Share 🚔 Print 👻 🛛 🚸 Directions 🚔 Measure 🛄 Bookmarks Find address or place Filters for Dat 5 nalysis

#### Contents

E Details

▼ Tree Observations Social Studies Block 1

1 About 🔄 Content 📃 Legend

🟥 Add 👻 📲 Basemap 🛛 🔛 Analysis

- Tree Observations Social Studies Block 2 📴 🥅 👧 🗖 🛄 💷
- Tree Observations Social Studies Block 4
- ✓ Tree Observations Science Block 1
- ✓ Tree Observations Science Block 2
- ✓ Tree Observations Science Block 4
- Secological Services Areas
- Allentown City Trees
- Allentown City Tree Density
- Allentown Percent Canopy Cover
- Allentown Property Crime
- Allentown Personal Crime
- ▶ S Tree Observation Areas
- Tree Canopy
- 2016 USA Population Density



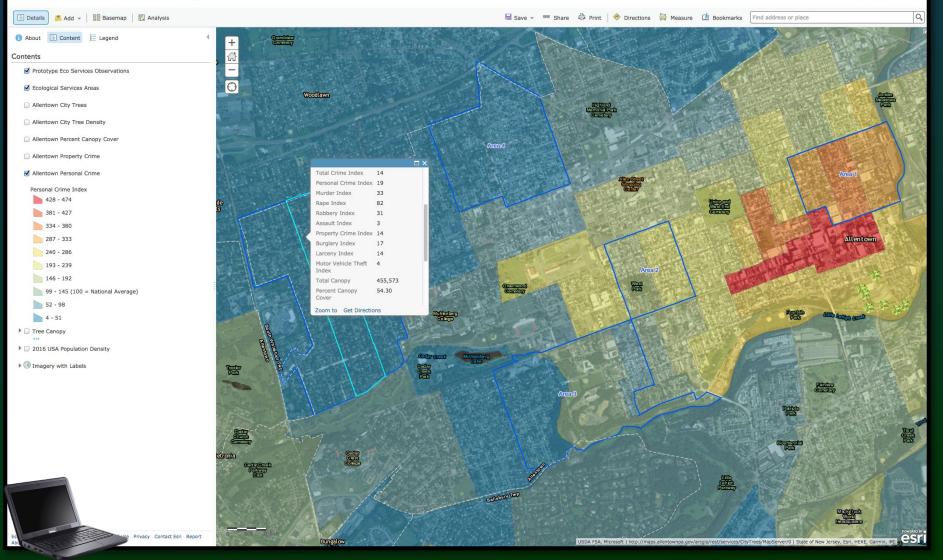
#### Percent Canopy Layer

#### Home - Prototype Eco Services Classroom Map 🔄 Details 🔰 Add 👻 🛛 🚟 Basemap 🛛 🖾 Analysis 🗟 Save 👻 🥯 Share 🚔 Print 🛛 🚸 Directions 🚔 Measure 🛄 Bookmarks 🛛 Find address or place Q 1 About 🔚 Content 📙 Legend - C - C Legend Fullerton Prototype Eco Services Observations Deciduous (leaves) Whitehall Twp Evergreen (needles) **Ecological Services Areas** Jorden Dorden living Prot Allentown Percent Canopy Cover Percent Canopy Cover > 71.8 to 88 > 59.9 to 71.8 > 49.5 to 59.9 > 42 to 49.5 > 35.5 to 42 > 29.6 to 35.5 > 24.2 to 29.6 Allentown > 18.6 to 24.2 > 12.6 to 18.6 Allenfown Municipal Area 5 4.8 to 12.6 Muhlenberg Gellego tedar Codar Co Fails Fallwlew Crost Crost College Loht-becut Machinels Wall Hidiate Park Lehigh Valley Hosp-Godar Allen 0 0.2 0.4m leip . Terms of Use . Privacy . Contact Esri . Report esri USDA FSA, Microsoft | http://maps.allentownpa.gov/arcgis/rest/services/CityTrees/MapServer/0 | State of New Jersey, Esri, HERE, Garmi

New Map 🔻 📃 Alec 🕶

#### Personal and Property Crime Layers

#### Home - Prototype Eco Services Classroom Map



#### Personal and Property crime and % tree canopy

#### Home - Prototype Eco Services Classroom Map Details 📥 Add 👻 📲 Basemap 🛛 🔣 Analysis Save -🥽 Share 🛱 Print 🛛 🚸 Directions 🚆 Measure 🛄 Bookmarks Find address or place 9 1 About 🔄 Content 📃 Legend Grandview Cemetery + は 0 Legend Prototype Eco Services Observations Deciduous (leaves) Woodlawn Evergreen (needles) ► □ × Memorial Park Total Crime Index 255 **Ecological Services Areas** Personal Crime Index 365 Murder Index 680 Rape Index 302 Allentown Percent Canopy Cover Robbery Index 708 Percent Canopy Cover Assault Index 207 Area > 71.8 to 88 Property Crime Index 240 Burglary Index 308 > 59.9 to 71.8 Larceny Index 220 > 49.5 to 59.9 Motor Vehicle Theft 232 Index > 42 to 49.5 Total Canopy 38,405 > 35.5 to 42 Percent Canony 13 47 Allentown Cover > 29.6 to 35.5 Zoom to Get Directions > 24.2 to 29.6 > 18.6 to 24.2 Area 5 Which Facts > 12.6 to 18.6 Constanty 4.8 to 12.6 Muhlenberg Gellege Allentown Personal Crime Personal Crime Index 428 - 474 381 - 427 Cedar Creck Park 334 - 380 Parts 287 - 333 Pelatow 240 - 286 193 - 239 Patriot 146 - 192 Cider Church Countary 99 - 145 (100 = National Average) Bicenten 52 - 98 Cedar Crost Colean etronia 4 - 51 Little Lohigh Parkwa Salisbury Twp Wold Contracts 0 0.1 0.2m acy . Contact Esri . Report USDA FSA, Microsoft | http://maps.allentownpa.gov/arcgis/rest/services/CityTrees/MapServer/D | State of New Jersey, Esri, HERE, Garmin, IPC STL Bungalow

New Map 🔻 📃 Alec 🕯

#### Data Comparison by Area

12. a	12. a. Complete the class table below. You will need the data from other groups in the class.							
	Area	Property Crime Index (USA Average = 100)	Personal Crime Index (USA Average = 100)	Percent Tree Canopy Cover (Allentown Average = 30%)				
	1	218.7	325.7	17.05% 📕				
	2	139	<mark>1</mark> 96.3	15.35%				
	3	73.7	69.3	31.69%				
	4	45.7	23.7	26.89%				
	5	25.3 🖡	22.3	52.94% 🕇				



## Authentic Culminating Task

#### **Area 6 Tree Planting**

#### **Feasible Site Selection**

The points in the black oval are the ones being planted in area 6. The pink points are the Kwanzan Cherry Trees and the blue points are the Flowering Dogwood Trees



# Authentic Culminating Task

#### **Benefits to the Built Environment**

-Trees can create lasting impression on how a community is perceived by visitors and affect the mood and community pride of its residents.

-The feeling of community pride created by trees can help reduce crime.

-By absorbing and deflecting falling rain, trees can reduce the floods.

-Reduces carbon dioxide, dust and other potentially harm gases in the air.



#### **Benefits To The Natural Environment**

-Trees can reduce air temperature by blocking sunlight. Further cooling occurs when water evaporates from the leaf surface.

-Trees create an ecosystem to provide habitat and food for birds and other animals.

-Trees absorb carbon dioxide and potentially harmful gases, such as sulfur dioxide, carbon monoxide, from the air and release oxygen.

-Trees cool the air, land and water with shade and moisture thus reduce the heat-island effect of our urban communities.

## Authentic Payoff to Place-Based Learning







# The work continues





#### **Culminating Project**

The city government is creating a new comprehensive plan for future sustainable development and is interested in smart growth.

Students ...

Identify locations for reuse of existing sites or changing existing infrastructure.

Identify locations for new development, features, facilities, parks, or open spaces.

Create a Web GIS map for their area that reflects their proposed changes.

Justify their proposed changes with data from the Web GIS.

Describe how their proposed changes promote Smart Growth principles for their city.

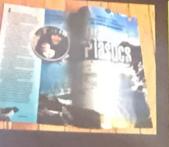
Explain how those changes are environmentally sustainable for their city.

Explain how the city will be more livable for its citizens.

# Learning Impact of Cross-Curricular SS/SCI Instruction

- Real world application (authenticity) increased student engagement ("How will I use this in the real world?"
- STEM kids find themselves at home in the SS classroom and vice versa
- ELLs and Diverse Learners benefit from hand on, less text-driven learning activities
- Impact projects attract community partners/resources that support student learning





# Science isn't useful unless it's communicated

JUSTINE AMMENDOLIA



# Questions and Comments

#### SESI materials are available at:

http://eli.lehigh.edu/sesi

Assessment access:

Login: eliteacher Password: 87dja92

#### Papers and this presentation available at:

https://eli.lehigh.edu/publications/research

For a free ESRI/ArcGIS Educational Account

https://www.esri.com/en-us/industries/education/licensing



