Home

METHODS OF STEM EDUCATION - ELEMENTARY

Nevada Our Home

5E Integrated STEM Lesson Plan by Joelle Massari

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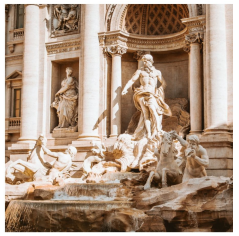
METHODS OF STEM EDUCATION - ELEMENTARY

How can I analyze and interpret data from maps to describe patterns of Earth's features for **fourth graders**?

This is your title for option A

Subject Integration

This is your title for option B



Justification

This is your title for option C

Standards

This is your title for option D

Measurable Objectives

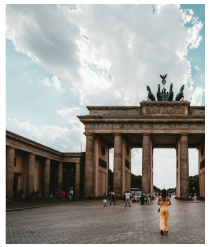
This is your title for option E

Nature of STEM

This is your title for option F

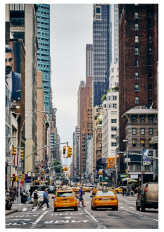
Data Integration

This is your title for option G



Differentiation of Instruction

This is your title for option H



Real-Life Connection/ Application

This is your title for option I

Possible Misconceptions

This is your title for option J

Engaging Context

Subject Integration

This lesson will integrate science, technology as well as social studies.

Science - Students will access a satellite image to describe features of our local geography.

Technology - Students will use technology to retrieve information from maps to analyze data. Students will also use Flipgrid as a method to communicate information.

Social Studies - Fourth grade students in Nevada learn about Nevada geography and issues that are prevalent to our community.

Justification

Science Students will access **Landsat Look** to analyze and describe patterns of Earth's features in the local Las Vegas area.

Technology - Students will use Landsat Look to use satellite technology to survey the local geographical features and landforms in the Southern Nevada area. In the satellite image, students can identify the Spring Mountains, Lake Mead, and the Mojave Desert. It can be an entry point to address patterns as a cross-cutting concept as a new objective. Using Landsat Look changes the teaching and learning as it offers an authentic, real world example that is relevant to a fourth-grader from Las Vegas, Nevada. Science and technology are completely interdependent on one another.

Social Studies - Specifically, students learn about the history and geography of Nevada. Using the topic of Nevada Our Home is a great way to integrate science, technology and social studies.

Standards

Science

4-ESS2-2

Analyze and interpret data from maps to describe patterns of Earth's features

Technology

4.DA.IM.1 Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate ideas.

(Nevada Academic Content Standards)

Social Studies

SS.4.23 Create maps that include human and physical features and that demonstrate spatial patterns in Nevada.

Measurable Objectives

Students will be able to *observe* the geography of Nevada from satellite images.

Students will *compare* images from today and 2013 using time lapse imagery to determine if there are any visible changes in Lake Mead due to our severe drought.

Students will be able to *create* a map of a specific area of Southern Nevada.

Students will be able to *communicate* their ideas about the future of our state using Flipgrid.

Nature of STEM

This lesson addresses the Nature of STEM as science and technology are completely integrated with one another. Students analyze data from a map to identify patterns of Earth. The lesson addresses the NGSS Science and Engineering Practices to analyze and interpret data to make sense of phenomena using logical reasoning. The Disciplinary Core Idea is the locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or near their edges. Maps can help locate the different land and water features areas of Earth. The Crosscutting Concepts are Patterns can be used as evidence to support an explanation.. Technology is integrated through the use of the data. The data source is that it correlates with the **science** standard 4-ESS2-2 quite well. It can be used to address the standard by having students analyze the map. In addition, there is a time lapse feature where students can examine the map over a course of several years. In Southern Nevada, not only do we live in a desert but we are experiencing an extreme drought. Looking at the time lapse feature of the area, students can make observations if the drought is evident from satellite imagery. Using this specific site of LandsatLook, which is a partnership between NASA and USGS, is integrating **technology** as it is using satellite imagery to generate. It isn't a static map from a textbook, but a current image. As for **engineering**, it addresses Analyzing and interpreting data from the 8 practices for engineering standards.

Engaging Contexts

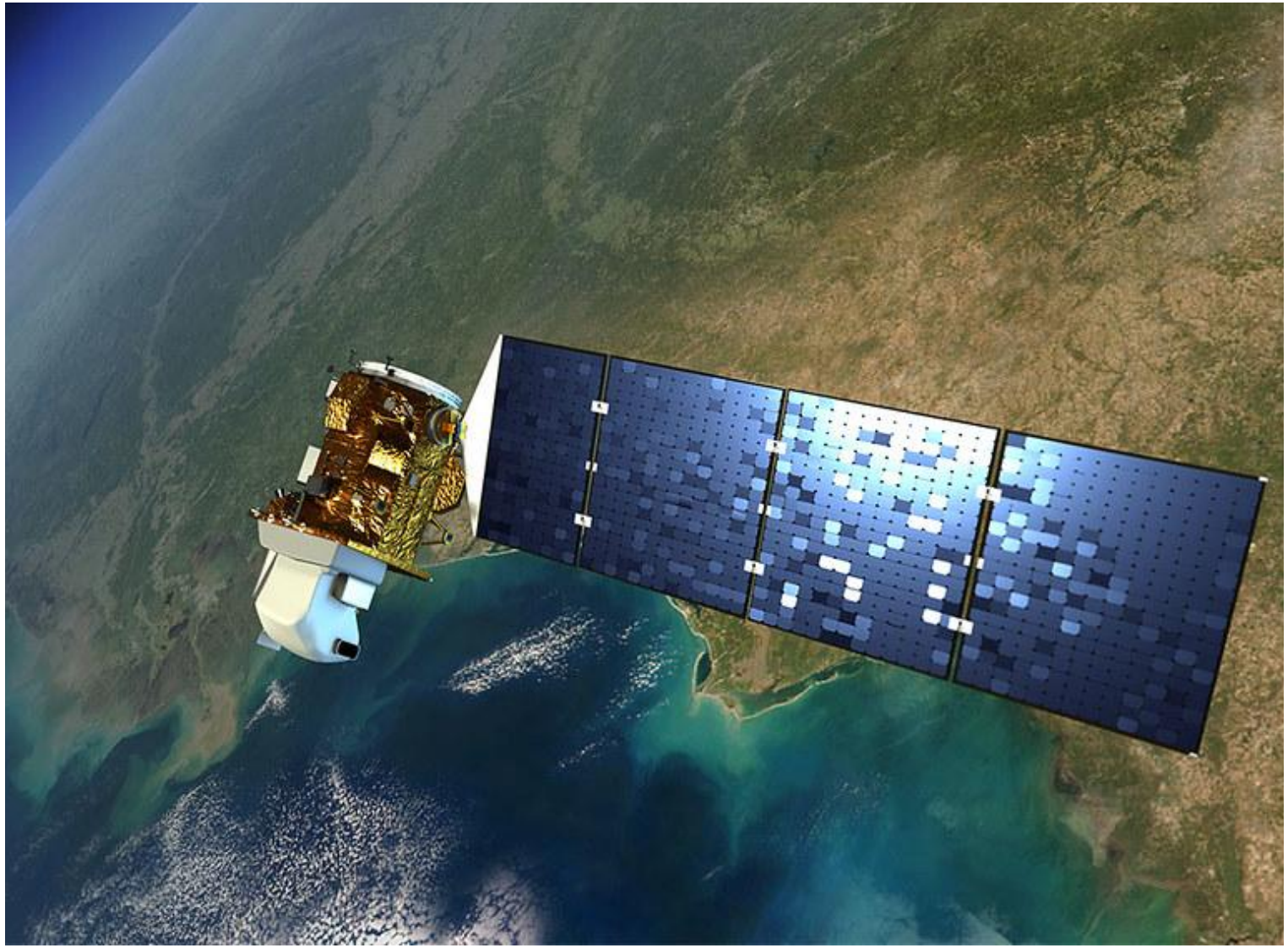
Hook:

Looking at this first map of Nevada, what do you notice? What do you wonder? Drought Map

Notice and Wonder Jamboard

Data Integration

4-ESS2-2 **Analyze and interpret data from maps to describe patterns of Earth's features**



To address the standard above, students will access Landsat Look to analyze and describe patterns of Earth's features in the local Las Vegas area. The specific link is https://landsatlook.usgs.gov/explore?date=2013-08-08%7C2021-05-09. In the event the link offers an access denied error, go to https://landsatlook.usgs.gov/ and click *explore* on the top right of the screen. Type Las Vegas in the search field on the left of the screen.

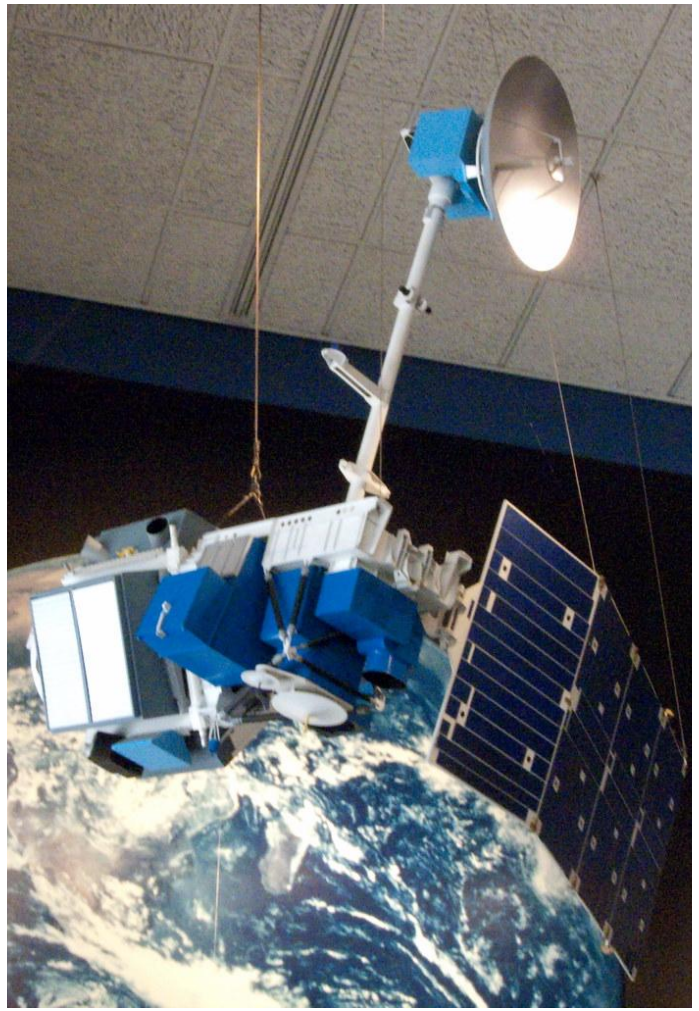
Differentiation of Instruction

Students can work with a peer as support.

Students can use sentence stems when ready to communicate ideas on Flipgrid.

Students can opt to use the camera or respond with text. Allow students the option to share models as an explanation when they are unable to verbalize or put into writing.

Extension resource for students who are ready to make greater connections
Extension resource



Sentence Stems

I notice...

I wonder...

On the map, I observed...

Real-life Connection/Application

Real-life Connection: This is tying into our Nevada Academic Content Standards for Nevada state history. By analyzing the local geography, students can relate the context into the local environment. We are fortunate to live in a rather unique location, with desert mountains and of course Lake Mead. These specific places are important for fourth graders to be able to identify. In addition, we are experiencing an extreme drought with exceptionally high temperatures. Using the connection of a NASA image of the day students can make connections to the wildfires that are raging the western part of the US as well as if there is evidence of a change in size of Lake Mead using time lapse imagery.

Possible Misconceptions

Students may misinterpret the map and not identify Lake Mead or the Mojave Desert properly.

Students may not understand the water level line in the above picture. The dark area is where the water previously was. The white area shows how much less water is presently in Lake Mead which is our primary source of water in Southern Nevada.

Lesson Procedure

Click for the 5E Lesson Procedure

Engage

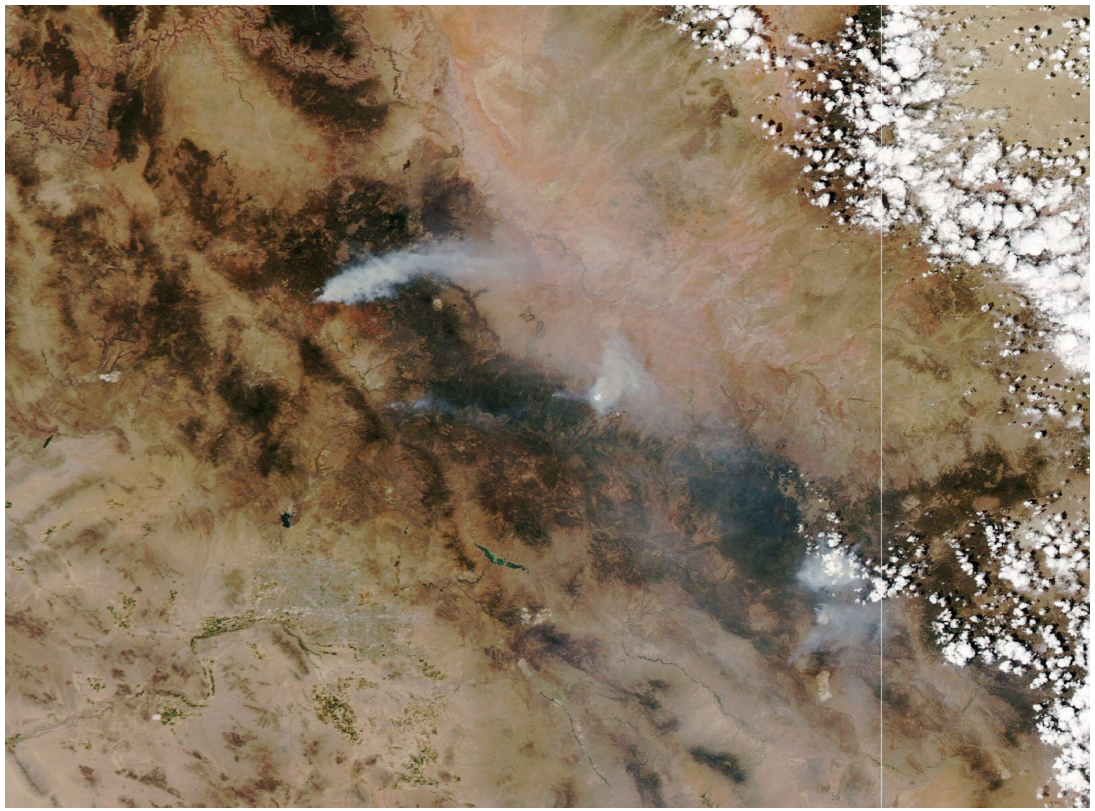
Procedure: Use the NASA image of the day. Post the questions I notice... (facts) I know… (inferences) I wonder… (questions) in a graphic organizer. Use questioning techniques to guide students to understand that it is a satellite image of the wildfires in the west.

Modifications Students can offer pictorial representations in lieu of written expression.

Standards Addressed E-SS2-2 Analyze and interpret data from maps to describe patterns of Earth's features

Formative/Summative Assessments Students will complete a graphic organizer regarding facts, inferences and questions.

Resources Graphic Organizer,
https://earthobservatory.nasa.gov/images/148473/fires-rage-in-arizona



Explore

Procedure: *Guide students to make observations from satellite imagery.* In cooperative groups of 4, students will go to this website https://landsatlook.usgs.gov/explore and type Las Vegas. Under date change the first date to (today's date, 2013). Keep the second date as the current year.

Modifications: Have a tech wizard go group to group to ensure the data is entered correctly.

Standards Addressed E-SS2-2 Analyze and interpret data from maps to describe patterns of Earth's features

Formative/Summative Assessments *Students will record their observations in STEM journal. STEM journal is a black composition notebook.*

Resources:

https://landsatlook.usgs.gov/explore

Black composition notebook

Pencils

Explain

Procedure: *Teacher will show satellite imagery of local area on Landset. Guide students to see locations of local landforms. Guide students to use time lapse feature to see if Lake Mead has changed in size due to extreme drought conditions in Southern Nevada. Help students identify Valley of Fire, Muddy Mountain Range and Lake Mead. Using Kagan timed rally robin, students identify any indications that Lake Mead has reduced in size.*

Modifications: Have printed resources of this screen image in the event there is a wifi issue.

Standards Addressed SS.4.24 Examine how and why Nevada's landscape has been impacted by humans.

Formative/Summative Assessments Students complete an exit ticket describing one characteristic they noticed about Lake Mead.

Resources

https://landsatlook.usgs.gov/explore?date=2013-08-08%7C2021-05-09

https://www.birdandhike.com/Hike/Views/_Views.htm

Jamboard Exit Ticket

Elaborate

Procedure: *Students will make connections with observations of landforms and any evidence of Lake Mead shrinking. Students will look for evidence of wildfires. What possible implications are there and what can citizens do to make changes in behavior to reduce any further implications of water size reduction and /or wildfire? Students will create a map showing a before and after (2013 to present) of Lake Mead. Include any evidence of the lake shrinking due to lower water levels.*

Modifications If students can not identify any evidence of Lake Mead shrinking, students can make a poster regarding ways to be water wise.

Standards Addressed *SS.4.23 Create maps that include human and physical features and that demonstrate spatial patterns in Nevada.*

Formative/Summative Assessments *Using a rubric for performance criteria of maps. See image to right.*

Resources Paper, pencils, https://landsatlook.usgs.gov/explore,

Making A Map : Nevada Our Home Satellite Imagery Comparision

CATEGORY	4	3	2	1
Map Legend/Key	Legend is easy-to-find and contains a complete set of symbols, including a compass rose.	Legend contains a complete set of symbols, including a compass rose.	Legend contains an almost complete set of symbols, including a compass rose.	Legend is absent or lacks several symbols.
Title	Title tells the purpose/content of the map, is clearly distinguishable as the title (e.g. larger letters, underlined, etc), and is printed at the top of the map.	Title tells the purpose/content of the map and is printed at the top of the map.	Title tells the purpose/content of the map, but is not located at the top of the map.	Purpose/content of the map is not clear from the title.
Neatness of Color and Lines	All straight lines are ruler-drawn, all errors have been neatly corrected and all features are colored completely.	All straight lines are ruler-drawn, most errors have been neatly corrected and most features are colored completely.	Most straight lines are ruler-drawn, most errors have been neatly corrected and most features are colored completely.	Many lines, corrections of errors, and/or features are not neatly done.

Rubric Listed Above

Evaluate

Procedure: Students will create a Flipgrid video to discuss observations and impact on environment.

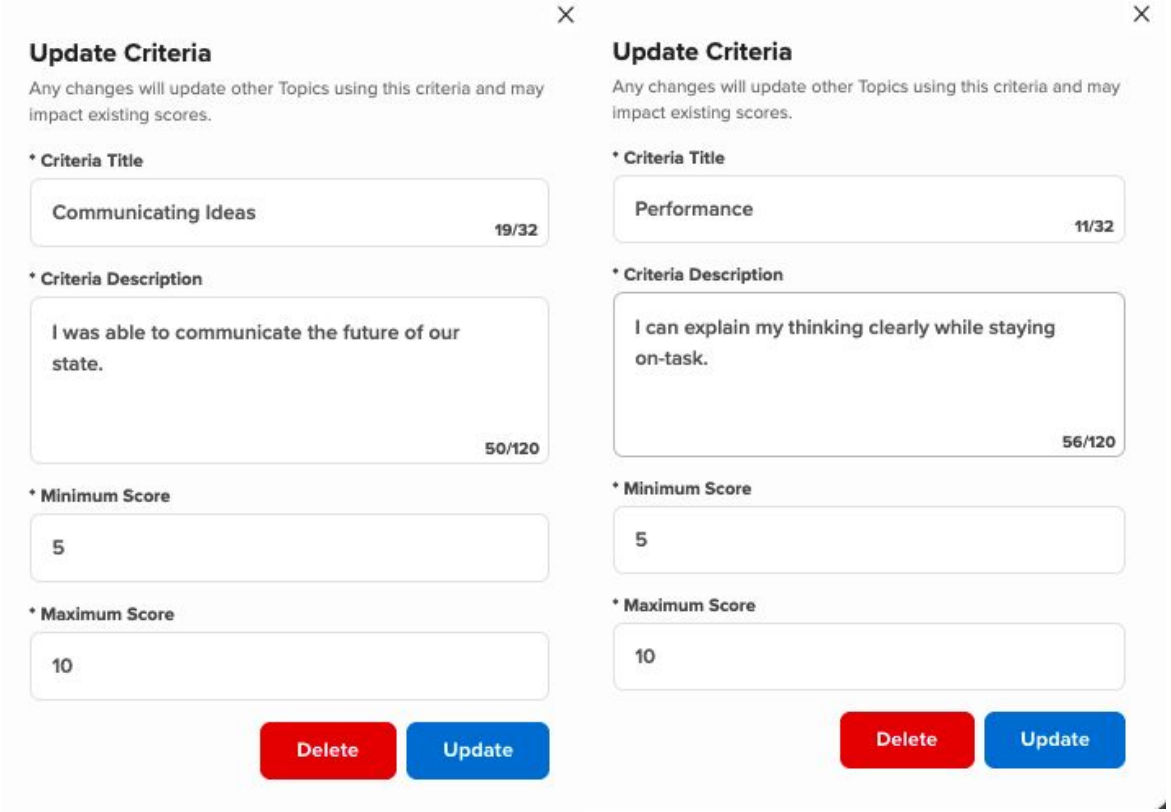
Modifications *Students can opt to use the camera or respond with text.* Allow students the option to share models as an explanation when they are unable to verbalize or put into writing.

Standards Addressed *4.DA.IM.1 Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate ideas.*

Formative/Summative Assessments *Rubric* - Feedback Critera to right

Resources https://flipgrid.com/8fa9616d

Guest Password is 5EStem!!



Feedback Criteria in the Flipgrid Topic

Teacher Background

The teacher should be familiar with the following:

Essential Questions:

- Students will be able to collect data in order to describe patterns in Earth's structures and phenomena.
- How do natural resources, geography and climate affect the way people live and work?

Vocabulary

human features - Human features are those landmarks, etc. that have changed the appearance of a landscape (i.e. buildings, bridges, roads).
physical features - Physical features are landmarks that occur naturally on a landscape (i.e. mesa, canyon, river, waterfall).
spatial patterns - This is the perception of how space is arranged on Earth. It includes the space between buildings (human features) and physical features.

-

A teacher should know the names of the specific mountain ranges

https://www.birdandhike.com/Hike/Views/_Views.htm

Lesson Materials

Websites/URLS

1. **https://landsatlook.usgs.gov/ click Explore**
2. **https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?NV**
3. **https://jamboard.google.com/d/1kmB1tliOKSO6NoyuAEtBAwNscvcWgRCg_AHO5qiOwBo/edit?usp=sharing**
4. https://earthdata.nasa.gov/learn/toolkits/wildfires
5. https://www.lvvwd.com/
6. https://docs.google.com/presentation/d/1tRgVcLqZhHAhfCftTfJbEcroGD-weUXi3irtkYSroc0/edit?usp=sharing
7. ***https://earthobservatory.nasa.gov/images/148473/fires-rage-in-arizona***
8. ***https://www.birdandhike.com/Hike/Views/_Views.htm***
9. https://jamboard.google.com/d/1P83rBqJTmk98mwKStJUpsDt5SuuUQqgFHtHFDHvsKZk/edit?usp=sharing
10. https://flipgrid.com/8fa9616d *Guest Password is 5EStem!!*

Credits.

Presentation Template: SlidesMania

Images: Unsplash and Pixabay

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