Hunger Games: Districts and Linear Functions

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Grade Level	8
Duration	2 class periods

National Standards	AZ Standards	Arizona Social Science Standards
GEOGRAPHY **Element 2: Places and Regions** 4. The physical and human characteristics of places. 5. That people create regions to interpret Earth's complexity.	**MATHEMATICS** **ALGEBRA** **Interpreting Functions** A1.F-IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Include problem-solving opportunities utilizing real-world context. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums. Focus on linear, quadratic, exponential and piecewise-defined functions (limited to absolute value and step). **SCIENCE** **Earth and Space** 8.E1U4.8 Construct and support an argument about how human consumption of limited resources impacts the geosphere.	**GEOGRAPHY** 8.G1.1 Use geographic tools and representations to analyze historical and modern political and economic issues and events. Key tools and representations include but are not limited to maps, globes, aerial and other photos, remotely sensed images, tables, graphs, and geospatial technology.

SIOP Elements

Preparation	Scaffolding	Grouping Option
Adapting content Linking to background **Linking to past learning** Strategies used	Modeling Guided practice Independent practice **Comprehensible input**	**Whole class** **Small groups** Partners Independent
Integrating Processes	**Application**	**Assessment**
Reading **Writing** **Speaking** **Listening**	**Hands on** **Meaningful** Linked to objectives **Promotes engagement**	**Individual** **Group** **Written** Oral

Arizona English Language Proficiency Standards
Grade 6-8 **Basic** **Listening and Reading**

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Standard 1 By the end of each language proficiency level, an English learner can construct meaning from oral presentations and literary and informational text through grade appropriate listening, reading, and viewing.

B-1: determine the central idea or theme and explain how they are supported by using some text evidence.

B-2: recount specific details and information in a variety of texts.

Speaking and Writing

Standard 3 By the end of each language proficiency level, an English learner can speak and write about grade appropriate complex literary and informational texts and topics.

B-3 compose informational text that includes details to develop a topic while using appropriate conventions.

B-5: use examples of precise language and domain-specific vocabulary within informative texts.

Standard 4 By the end of each language proficiency level, an English learner can construct grade appropriate oral and written claims and support them with reasoning and evidence.

B-1: construct a claim about a topic or text.

B-2: supply a reason that supports the opinion and is based on some textual evidence.

B-3 use grade appropriate words and phrases.

B-4: provide a concluding statement to an opinion.

Listening, Speaking, Reading, and Writing

Standard 6 By the end of each language proficiency level, an English learner can participate in grade-appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions.

B-1: participate in discussions about familiar topics and texts.

B-2: participate in written exchanges about familiar topics and texts.

B-5: contribute relevant information and evidence to collaborative oral and written discussions.

Overview

The year is 2096. Panem, is the country that rose up out of the ashes of a place that was once called North America. Panem is the result of drastic climate change that brought drought, storms, fires, encroaching seas that swallowed up much of the land, and a brutal war for the few resources that remained. In Panem, each of the 12 Districts must furnish the Capitol with natural resources. This look at a future world through the popular novel, Hunger Games, provides an engaging dystopic scenario through which students analyze regional resources through charts, tables, graphs, linear functions, and algebraic equations.

Purpose

In this lesson students will analyze data to make an argument for how the production expectations of the Capitol impacts regions and their natural resources. Students will graph data and write an algebraic expression. They will also make predictions and generalizations about the impact of resources on the geosphere. While this lesson involves a fictional setting, the consumption of natural resources can be applied to our world today. This lesson contains adaptations for diverse learners (ELLs).

Key Vocabulary

thermal expansion: increase in water volume due to rise in temperatures

natural resources: materials that occur in nature, often used for an economic gain

economic advantage: gains that occur involving money

linear function: an equation with 1 or 2 variables that will form a line when graphed on a coordinate plane

cost/benefit analysis: a process that weighs the benefit of a decision as it relates to the cost of the decision, often used to make political and business decisions

Materials

- Vocabulary Cards
- The Anatomy of Panem Graphic Organizer
- Panem Maps
  - Color Map http://www.panempropaganda.com/panem-maps/
  - Black and White Map (unlabeled)—Arizona Geographic Alliance
  - Black and White Map (labeled)—Arizona Geographic Alliance
- Panem District Cards (Districts 7, 10, 12)

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- Natural Resources of Panem and Answer Key
- Session 1: Exit Ticket and Answer Key
- Peer Evaluation Success Criteria Checklist
- End Assessment and Answer Key
- Vocabulary Test and Answer Key
- Colored pencils/ crayons/ markers
- Personal or online graphing calculators or www.desmos.com
- Chart paper
- Sticky notes of various colors

Objectives

The student will be able to:

1. Analyze a region and its sustainability in terms of its use of natural resources.
2. Create graphs to represent quantities in real world context.
3. Interpret graphs to write expressions to represent a real-world situation.

Procedures

Prerequisite Knowledge: Students should have been introduced to the linear functions and be comfortable with graphing calculators.

SESSION ONE

Engage:
a. Open the class by saying, "The year is 2096 and America as we know it, is no more. As a result of DRASTIC climate changes, disasters, and rising seas that have changed the coastlines, a brutal war ensued over the limited resources left. Panem arose from the ashes of war. It is the new country made of 12 districts, each providing goods and services to the Capitol."
(Application: Promotes engagement)
b. "To understand what is happening, we need to learn some new vocabulary that we can apply to the situation." Distribute and review the Vocabulary Cards. Have students practice saying the words and definitions to a partner.
(Integrating Process: Listening and Speaking)
c. Continue with, "Let's hear from Panem's President Snow as he explains Panem's history." Watch (1.17)
https://www.youtube.com/watch?v=tl9aqZk4kFU
d. "So let's continue to learn more about Panem's Districts and resources." Distribute The Anatomy of Panem Graphic Organizer, watch another clip https://www.youtube.com/watch?v=gsgt_TjMhWU&feature=youtu.be (1.28) and instruct students take notes on the Districts and their resources.

(Integrating Process: Listening and Writing, Scaffolding: Comprehensible input)
e. Pass out the black and white version of the Panem map that is unlabeled. In groups, have the students predict where the districts are located based on the goods they provide to the Capitol. **(Grouping Option: Small Groups)**
f. Project the colored version of the Panem map https://www.panempropaganda.com/panem-maps/ and compare the group answers to the fictional setting of the book. Continue the discussion with "Why would Panem create new boundaries based on these resources? How might a District transport these resources to the Capitol? What do you notice about the size of each District? What could be some possible reasons for the difference in sizes?" **(Grouping Option: Whole Class)**
g. Optional: You may want to have students color their blank maps by District and make a key. Or provide students with a colored map.

Explore:
a. Divide the class into collaborative groups of 3-4 students. Remind them that this is a group project, and everyone should be contributing. Distribute 1 Panem District Card to each group. *Note: Since there are only 3 District Cards (#7, 10, and 12) more than one group will have the same District.* Explain the Natural Resources of Panem worksheet where the students will make generalizations using the information provided in the table, use the table or create a function table, graph the data using a graphing calculator, and write an algebraic equation to represent the data. Give students time to work together.
(Application: Meaningful; Integrating Processes: Speaking; Preparation: Linking to past learning; Grouping Option: Small Groups)

Explain:
a. Before sharing ideas with the class, have students share the following within their groups so that ELLs have an opportunity to rehearse their answers.
   o What type of graph did your data produce?
   o What was your equation to represent the data? **(Integrating Process: Speaking)**
b. Then ask groups to share out solutions for their District with the class. **(Integrating Process: Listening)** Clarify misconceptions, validate ideas and plausible solutions, reinforce terminology and academic vocabulary, and correct or discuss errors in math.

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c. Session 1 Exit Ticket **(Assessment: Individual, Written)**

SESSION TWO

Elaborate:
a. Begin the class by having one or two groups share a summary of the previous session's findings and new ideas. **Processes: Speaking; Preparation: Linking to past learning)**
b. Distribute chart paper and art supplies. Instruct the groups to use their worksheets to create a poster. Posters should include but are not limited to:
   o Name of the District.
   o Data table.
   o A graph.
   o Algebraic equation.
   o Generalizations about the data as it relates to the District and how it supports the Capitol.
   c. Have groups hang their posters so that all of the District 7 posters are together, District 10 posters are all together, etc. and do a gallery walk.
   d. Instruct students to compare the graphs and information from the District posters for the same District and comment via sticky notes on the posters. Tell them to observe and make generalizations regarding the data presented.
   e. Students can use these questions to guide them in making comments. You may want to project these so students can remember them.
   ✓ What does the graph say about the goods produced?
   ✓ What does the math suggest us about District productivity and their importance to the Capitol?
   ✓ Why might the data be like this? Are there outside or natural factors that may affect the data?
   ✓ How do you think the Capitol has impacted the natural resources of this district?
   (Application: Meaningful, Hands on)
   f. Groups will then partner with another group and use the Peer Evaluation Success Criteria Checklist to score one another's poster. **(Application: Promotes engagement)**

Evaluate:
   a. Give the Vocabulary Test and use the End Assessment to evaluate the students.

(Assessment: Written, Individual or Group)

Assessment

Geography and ELA
The Anatomy of Panem Graphic Organizer can be graded for accuracy and completeness. Mastery will be considered a score of 90% or higher.

Session 1: Exit Ticket can be scored using the point values on the Success Criteria. Mastery will be considered a score of 80% or higher.

The Vocabulary Test can be given to measure language acquisition. Mastery on the Vocabulary Test will be a score of 80% or higher.

Mathematics
The Natural Resources of Panem worksheet can be graded. A score of 80% or higher will be considered mastery.

The Peer Evaluation Success Criteria Checklist can be scored. Mastery will be considered 6 checks or more in the Completed column.

The End Assessment can be scored with the Success Criteria for Grading. Mastery will be considered a score of 12 points or higher.

Extensions

Engineering
Build a MORE efficient method to transport natural resources to the Capitol based on their relative locations.

Build a clean energy system for a fossil fuels District to rebels against the Capitol.

Critical Thinking
Have students RANK Districts from most to least important to the Capitol using the map, data or other outside sources as justification.

Sources

Panem Map adapted from,
http://www.panempropaganda.com/panem-maps/

Panem Black and White Map from Arizona Geographic Alliance

District information adapted from,

https://thehungergames.fandom.com/wiki/Panem

Lesson inspired by the novel, The Hunger Games, by Susan Collins 2008

Regional Natural Resource Data inspired by USDA (Cattle- District 10), Oregon Department of Forestry (Timber- District 7), and Energy Information Association (Coal- District 12)

YouTube videos
https://www.youtube.com/watch?v=gsgt_TjMhWU&feature=youtu.be
https://www.youtube.com/watch?v=tl9aqZk4kFU

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