

Earth's Resources: A New View

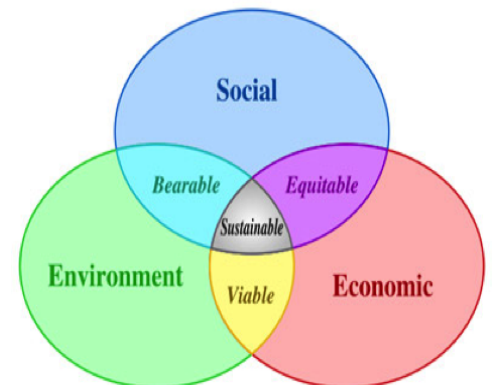
A Resource Scarcity Activity

Overview: Students will explore Earth's resources and how they are used to meet the "basic needs" of a society focused on the following six basic necessities; **food, clothing, shelter, education, commerce** and **water**. In small groups, the class will collaborate to provide those basic needs for their countries, using only the resources given to them. Students will understand limits and equity issues and how an economy is impacted by finite access to an environment's resources, and how ultimately, these might be considered as "relatives" in the way they support our well-being.

Driving Question: How can we share limited resources?

What does it mean to live "Sustainably?"

To live sustainably, we must consider the interdependence of the **3E's: *Environmental, Economic, and Social Equity*** needs of today and tomorrow's societies, while continuing to protect biodiversity and preserve ecosystems. The finite nature of our earth's resources challenge us to consider the products we consume daily and the resources used to make those products, both directly and indirectly through product life cycles: water, soil, oil, minerals, trees, etc.



A Springboard to Place, Problem and Project-Based Learning

Each small student group functions as an imaginary country using art supplies to represent their country's "resources." Group members each have a defined role to play in supporting the group's collaborative process of meeting the "basic needs" of their country's society. Each of the countries has its own set of resources that the group must try to use to meet the six basic needs of their citizens. While the class might identify other basic needs of a society, for the purpose of this simulation, we focus on these six basic needs: food, clothing, shelter, water, education, and commerce.

Through this initial experience, students may also discover societal sectors they feel deeply about, or for which they have a particular skill set or background knowledge. This will allow them to engage in a related Place, Problem, and Project-Based learning experience from a specific viewpoint.

Lesson Overview

Unit Title: Earth's Resources: A New View (A Resource Scarcity Activity)

Grade Levels: 4-12

Subject Areas: Interdisciplinary; Social Studies; STEM; ELA; Global Studies; Ecology; Earth Science

Unit Duration: 2 hours or 2-3 45-minute class periods

Local and Real World Contexts: Exploration of local and global resources

Activity Summary: This activity focuses on resources and how they are used to meet the “basic needs” of a society. The class might identify other needs, but for purposes of this activity we are limiting consideration to the following six basic necessities; **food, clothing, shelter, education, commerce** and **water**. In small groups, the class will collaborate to provide those basic needs for their countries, using only the resources given them.

Open-Ended Driving Question: How can we equitably share limited resources?

Desired Outcomes

Next Generation Science Standards

- 4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
- 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem
- HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
- HS-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.

EfS Standards ([USPESD](#))

2.3 Economic Systems

- Resource Scarcity: Students analyze the use of a local natural resource (e.g. animal, mineral, vegetable, lumber, fish, and minerals) and consider the resources' ability or inability to regenerate at a sustainable level.

<p>2.4 Social and Cultural Systems</p> <ul style="list-style-type: none"> • Resource Distribution: Students compare the distribution of a common resource (e.g. money, food) of different groups of people in their own community, region, nation, or world and explain how this resource distribution affects sustainability. • Multiple Perspectives: Students consider an issue or challenge related to sustainability, through a variety of lenses or perspectives and they explain how approaching that issue or challenge from different perspectives may result in different decisions and outcomes. 	
<p>Big Ideas of Sustainability</p> <ul style="list-style-type: none"> • Interdependence • Limits • Fairness/Equity 	<p>Essential Questions</p> <ul style="list-style-type: none"> • Who decides the limits on a resource? • How are human and natural systems interrelated? • How do our actions impact others?
<p>Learning Objectives</p>	
<p>Students will <i>understand that</i> . . . (concepts)</p> <ul style="list-style-type: none"> • To live sustainably, we must meet the needs of today's and tomorrow's societies, while continuing to protect biodiversity and preserve precious ecosystems. • Students will understand equity issues and how an economy is impacted by finite access to an environment's resources. • The earth's surface is home to many different communities all with an uneven distribution of resources. 	
<p>Students will <i>know that</i> . . . (facts)</p> <ul style="list-style-type: none"> • There are basic needs for every living thing, and these resources are shared. • Earth's resources are finite 	<p>Students will be <i>able to</i> . . . (skills)</p> <ul style="list-style-type: none"> • Work together to solve a problem • Develop a list of basic needs of living things • Keep track of the flow of resources in and out of their imaginary country
<p>Learning Plan</p>	
<p>Engage: Small student groups brainstorm around the question, "What do we need to survive?" and come up with a list of basic needs. The class might identify other needs, but for the purpose of this activity we focus on six basic necessities; food, clothing, shelter, education, commerce and water.</p>	
<p>Inform:</p>	

Our earth has finite resources – but we need and use those resources every day. Students play the Resource Scarcity game. Small groups of students represent different “countries.” No single country has adequate resources to fulfill all 6 basic needs for their citizens. Students keep track of their countries' resources on the transition log.

Apply:

When all the groups have completed their work and the basic needs of their countries have been met, have students reflect on the following....

What helped some groups achieve more success than others? Leadership? Planning? Conservation? Creativity? Generosity vs. greed? Rules/laws?

What other resources can you add from the list of basic needs your group came up with at the beginning of class?

- Should we share our resources with other countries? Should we conserve them?
- Some countries have more resources than others, is it fair?
- Should others have a say if a country misuses its resources?
- What are some of the “Big Ideas of Sustainability” in this activity?

Lesson Plan
Resource Activity

Subjects: Interdisciplinary

Grade Levels: 4-12

Number of Students: This activity is configured for 30 students (5 groups of 6 students). If you have fewer students use fewer “Country Envelopes.”

Materials: 5 large 9” x 12” envelopes containing the following materials:

2 Scissors	10 Paper Clips	2 pencils
1 Glue Stick	1 Ruler	1 blue marker (thick)
1 orange marker (thick)	5 sheets white paper	3 sheets yellow paper
2-6” orange paper squares	2-6” white paper squares	3 sheets blue paper
1 sheet purple paper	3 sheets green paper	

Preparation: Organize the materials above into **5 Country Envelopes** as follows.

Country #1	1 pair scissors, ruler, 5 paper clips, 2 pencils, 2-6” orange paper squares, 1-6” white paper square
Country #2	1 scissors, 1 glue stick, 2 sheets blue paper, 1 sheet white paper
Country #3	1 blue marker, 1 sheet green paper, 2 sheets white paper, 2 sheets yellow paper
Country #4	1 sheet green paper, 1 sheet yellow paper, 1 sheet blue paper, 1 sheet purple paper, 1 sheet white paper
Country #5	5 paper clips, 1 orange marker, 1 sheet green paper, 1-6” white paper square, 1 sheet white paper

Teacher Materials:

- 6 Student Instruction/Transaction Logs
- Chart-Paper and Teacher Notes for Debrief

Countries: Each group functions as a country with both:

- Individual Country Characteristics: a unique self-appointed name and their own envelope of “resources.”
- Common Country Characteristics: 6 jobs as described on the *Student Instructions and Transaction Log*. Be clear with students that the only student allowed to “leave the country” is the Explorer, and the only student recording resources is the Scribe.

Citizen Observer Jobs Summary

Citizen	Job	Job Description
1	Leader	<ul style="list-style-type: none"> • Is in charge of the country but cannot travel; • Supervises all tasks; • Approves any trades or donations.
2	Explorer	<ul style="list-style-type: none"> • Only member who can search other countries for resources; • Must negotiate with that country’s supply holder.
3	Reader	<ul style="list-style-type: none"> • Reads instructions aloud for assembling each item on the “basic needs” chart.
4	Supply Holder/Courier	<ul style="list-style-type: none"> • Keeps track of resources (like banker in “Monopoly”) and works with scribe to record transactions; • Negotiates with other countries’ explorers; • Courier delivers finished products to the teacher.
5	Scribe	<ul style="list-style-type: none"> • Records resource/materials and trades or donations.
6	Builder	<ul style="list-style-type: none"> • Produces “basic needs” with support from fellow country citizens.

Procedure:

- 1) Grouping: Divide students equally into 5 Groups
- 2) Initial Information: Provide each group with **one** *Student Instructions and Transaction Log*
- 3) Country Identity: After students are seated in their small group, read the following instructions before they begin:

- a) *Welcome to your new country! Please hold up the sheet that says [“Student Instructions and Transaction Log”](#) in the top right hand corner.*
- b) *You will have 3 minutes to read this information with your country and complete Step #1*.*
- c) *As soon as you have completed Step #1 – raise your hands, and I will deliver your country’s Resource Envelope, so you can begin meeting the 6 Basic Needs of your citizens.”*
- d) *Our activity will be completed after each and every country has delivered their set of 6 Basic Needs to me. You have 3 minutes to complete Step 1. Let’s Begin.*

*Country Naming Options: Some teachers choose a category for country names such as plants, trees, animals, or other nature elements to facilitate better student choices.

- 4) **Distribute Country Envelopes:** Give the “Country 1” envelope to the first group who raises their hands with Step 1 completed. The next group to raise their hands gets the “Country 2” envelope, and so on.

[While each envelope contains different amounts and types of resources, do not share this information with your students.]

6 BASIC NEEDS TASKS: As soon as countries begin working, they will discover that each country has different access to resources. Within their defined roles, countries will begin to understand the necessity of global relationships and will need to interact in structured ways, as defined by their job descriptions.
(DO NOT share this visual with students)



Each group must fill the “Six Basic Needs” of their country. These needs must be met by completing the tasks listed, precisely as noted.

1. **FOOD** - make 4 strips of green paper, each 3”x1”.
2. **CLOTHING** – make an orange t-shirt 4” high.
3. **SHELTER** – make a white square 2” on each side and attach an orange roof to one side of the square.
4. **EDUCATION** – make a 4-page book.
5. **COMMERCE** – make a 4-link paper chain out of yellow paper.
6. **WATER** – make a blue circle 2” in diameter.

Teacher Tip: None of the countries have adequate resources to fulfill all 6 basic needs for their citizens. Country members must work out problems by discussing their resource needs within the group and then having the Explorer search for resources from other countries. While the Explorer “travels” to negotiate for resources from other countries, the remaining team members should focus on their jobs, and the Scribe records any transactions that take place.

Scoring

Share the point values below with students ***after*** they complete the simulation.

Points	Country Action
2	Any single task finished accurately
1	Any single task finished but NOT accurate
1	Each donation of a resource to another country
2	Each single, fully-completed task
1/2	Each traded or loaned resource
10	Country receives an additional 10 points if all 6 tasks are completed accurately

Reflection/Follow-up Discussion

When all the groups have met the basic needs of their countries or after scoring, have students reflect on the experience first as individual groups, and then as a whole group. Discuss these questions with your group (keywords to inform your discussion: leadership, planning, conservation, creativity, generosity vs. greed, rules/laws):

1. How did the game experience go?
2. What was fair or unfair about the game?
3. What helped your group finish the task faster than other groups?
4. Do you think you were successful?
5. How do you think the scores should have been assigned?
6. What assumptions, beliefs or values (“Mental Models”) guided your country’s decisions?

Defining Sustainability: When the **Environmental**, **Economic** and social **Equity** needs of a society are met in the present without compromising the ability of future generations to meet their needs. The following questions relate specifically to the “3Es” of Sustainability.

Environmental:

- What was your country's stewardship of resources? (How did they care for what they had access to?)
- Were the resources being shared? Was there enough? For how long?
- Should others have a say if countries misused their resources? What if we misuse our resources; should other countries be able to object?
- Who decides whether the USA needs resources from other countries?

Equity:

- What happened between the countries' citizens? Was there a collaborative "Can Do" attitude? Was everyone being heard?
- How did the activity unfold within your group?
- Was it fair that some countries had more resources than others?

Economic:

- Consider the resources we humans require to conduct our daily lives: oil, minerals, soil, water, trees. Did citizens discuss access to any of these resources?
- Did you discover any additional societal needs?
- Did country members consider how their access to resources will impact the country's economy?

Suggested Timing for Resource Activity - 63 minutes

3 minutes	Step 1	Students receive Student Instruction and Transaction Log. They choose a country name, each student's job, and describe their country's biome. Then they raise their hand to indicate they are ready for step 2.
30 minutes	Step 2	Countries get resource envelopes and students create basic needs symbols, by either using resources from their envelope, or trading, donating, and borrowing from other countries.
10 minutes	Scoring	Teacher scores each team's Transaction Log while small groups begin a reflection/discussion within their 'Country.'

20 minutes	Discussion and Note-Taking	Teacher provides scores to the whole group and begins a facilitated debrief, focusing on the experience through social (inequity), economic vitality and resource availability.
<i>To Be Continued...</i>		Using the notes from the activity discussion as a baseline for student understanding, launch into an emergent inquiry-based project!