SOCIAL STUDIES

Teaching Portfolio

By: Sam Park

4 Lesson Plans created by me

LESSON PLAN

Lesson Plan Information	
Name: Erika N., Marta S., Sam P., and Vanessa L.	Date: Nov 6, 2023
Grade Level: Grade 3	Subject/Course: Social Studies
Topic: Natural Resources/Environment	Time Frame: 20 minutes

Big Idea

How can we use resources more responsibly?

In this lesson, students will be involved in inquiry-based learning through engaging open-ended and thought-provoking questions of resource use, its environmental effects, and how one can solve/mitigate its negative effects.

Ontario Curriculum Expectations

B. People and Environments
B2: Inquiry: Natural Environments and Ways of Life
Specific: B2.1, B2.2, B2.4, B2.5

Objectives

Concrete skills

- ✓ Students can
  - identify the different resources, and how humans use them.
  - use a See/Think/Wonder graphic organizer.
  - navigate the internet and use books to find information.

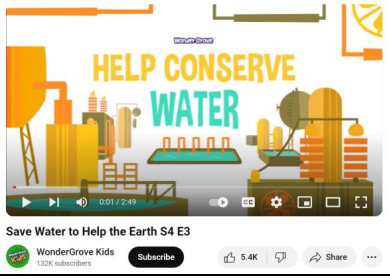
Higher-order thinking

- ✓ Students can
  - ask a variety of questions (factual, conceptual, and provocative) and critically engage in conversations.
  - communicate their ideas visually and verbally.
  - evaluate evidence and draw conclusions about the short- and long-term effects on the environment of different land and resource use.
  - think of creative solutions and way to help.

Resources

Technology

- Computer, projector, YouTube video, Google/Microsoft Forms
  - Video: https://www.youtube.com/watch?v=rl0YiZjTqpw



- Exit ticket

Materials

- Resource manipulatives: Natural (oil, water, minerals, wood); Product (Plastic car, reuseable water bottle, paper, table salt) and Picture (Photos of habitat/resources)
  - Oil pictures and manipulatives




  - Water pictures and manipulatives



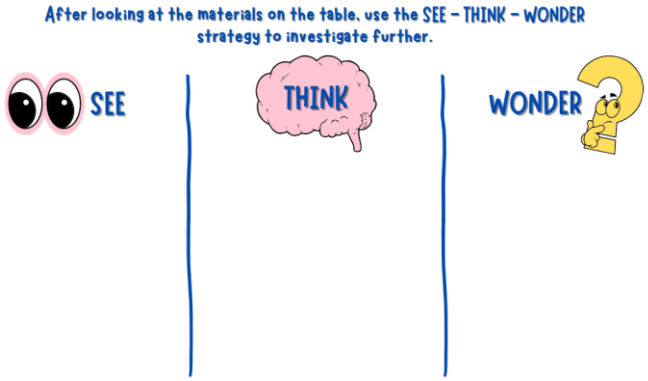
  - Minerals pictures and manipulatives



  - Wood pictures and manipulatives



- Chart paper, post-it notes and markers.
- See/Think/Wonder worksheets.



Specific Activities that Differentiate

Electronic or paper options

- The read-aloud can be with a hard-copy book, or a YouTube video.
- The See/Think/Wonder chart could be on a chart paper, or a digital Jamboard.
- The explore stage could be through a virtual field trip, or a trip to the library.

Level of support

- If students are having difficulties choosing an idea to explore, teachers can provide guiding questions, give more examples, or directly assign a topic.
- Students can have the option in creating a letter, poster board, or start a project
- Students can work individually, or in groups.
- Provide electronic/technical support.

Scope

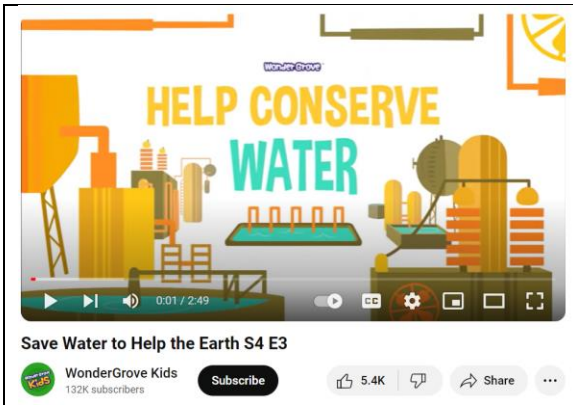
- Increase or decrease the number of resources that students can focus on.

Inquiry: Engage

1. **Engage**

A) Video and Discussion (timeframe: 5 minutes)

Materials: Video: https://www.youtube.com/watch?v=rl0YiZjTqpw



Options: Can use a children's book, or a different video.

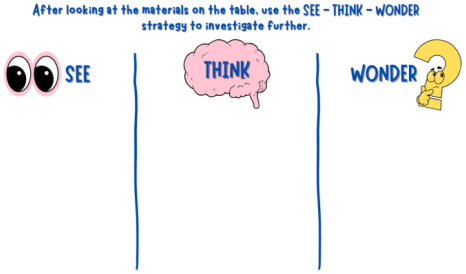
- Students will listen to the video, and consider the guiding question: *"How can we use resources more responsibly?"*
- After the video, the whole class will engage in an open-ended discussion on:
  - When do you use resources (water, wood/paper/cardboard, oil/plastic, minerals) in your day?
  - Where have you seen waste or pollution around you?
  - What are some alternative solutions you can think of?

B) See/Think/Wonder (timeframe: 5-10 minutes)

Materials: Natural resource manipulatives and pictures, see/think/wonder worksheets, chart paper, and markers

Options: Could use Jamboard or an electronic program.

- There will be 4 table stations, each set up with one type of resource (wood, water, oil, or minerals).
- Individually, students will complete a see/think/wonder worksheet at their table groups.



- Students will discuss with their table groups and combine their wonders/questions onto a chart paper.
- The wonder chart paper will be posted on the walls for a gallery walk.

C) Gallery Walk (timeframe: 5 minutes)

Materials: completed chart papers, markers, post-it notes

- Students will walk and visit the different group stations. While exploring, they will put post-it notes with their "I wonder" questions beside each group's station.

Exit Ticket and Consolidation (timeframe: 5 minutes)
Materials: Google/Microsoft Forms

- Conclude with discussion of ideas/concepts and exit ticket.

Explore/Explain and Extension/Elaborate

2. Exploration and Explanation (Next Class)

A) Explore

- Students will have chosen one question they want to explore with their group.
- To explore this question, students will go on virtual field trips, read books, and search the internet.
- Students will create a graphic organizer to explore the 5 W's.
    - Questions can be: What is the resource, how do humans use it, what are the negative effects, why is there a problem, how they can help, etc.

B) Explain

- Students will write down their ideas and present them in a Jamboard/chart paper.

3. Extension/Elaboration (Next Class: Find a Way to Help)

- Students will think of ways they want to help.
    - For example: Students could write letters to the mayor/counselor, make a flyer/poster, or start a new environmental initiative.

Method of Evaluation

Graphic Organizers

- Students will complete graphic organizers (assessment for learning) to monitor their progress towards achieving expectations.

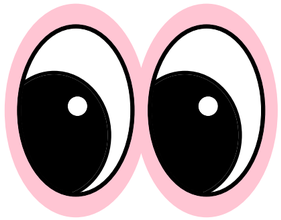
Self-Assessment/ Exit Ticket

- Students will complete a self-assessment (assessment as learning) on Google/Microsoft Forms. Example questions:
    - What was something new that you learned?
    - What do you want to learn next?
    - How well do you think you are learning?

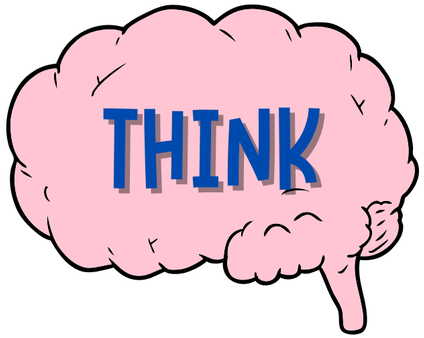
Project Assessment

- Students will complete a project (assessment of learning) to demonstrate how they can help.

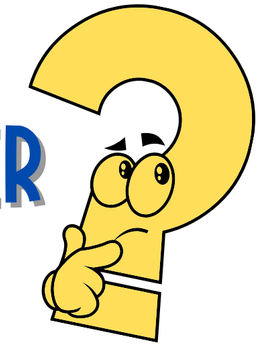
After looking at the materials on the table, use the SEE – THINK – WONDER strategy to investigate further.



SEE



WONDER




Natural Resources
Erika, Marta, Sam, Vanessa


How can we use resources more responsibly?


Save Water to Help the Earth S4 E3
Copy link
Wonder Grove Kids
Episode
Watch on YouTube

Let's Discuss

When do you use resources in your day?

Let's Discuss

When do you use resources in your day?

Where have you seen waste or pollution around you?

Let's Discuss

When do you use resources in your day?

Where have you seen waste or pollution around you?

What are some alternative solutions you can think of?

See, Think, Wonder

After looking at the materials on the table, use the SEE – THINK – WONDER strategy to investigate further.

SEE

WONDER

See, Think, Wonder

- Discuss in your group the “wonders” you each had

- Combine and write your group’s “wonders” on the chart paper

Gallery Walk

- Walk around and add your questions next to each group's "wonders"

Exit Ticket

https://forms.office.com/r/QfUPU3JjTs

- Answer the questions on this form
  - What was something new you learned?
  - What did you find interesting?
  - What do you want to learn next?

Next Steps
Explore

- Students will choose one question they want to explore with their group

- Students will either research their question using:
  - books
  - internet
  - virtual field trips

- Students will explore the 5 W's on a graphic organizer (who, when, what, where, and why)

Next Steps
Explain and Elaborate

- Students will explain and write down their ideas and present what they have researched (ie. graphic organizer)

- Students will "Find a Way to Help"
  - Choosing their medium and presentation of choice; Examples are:
    - writing letters to the mayor/counselor
    - making a poster, booklet, brochure
    - start an environmental initiative


ThankYou

Medieval Times Lesson Plan

Lesson Plan Information		
Teacher: Sam Park	**Date**: March 15, 2024	**Grade:** 4
Subject: Social Studies	**Timeframe:** 50 minutes	**Topic:** Medieval Times

Overview and Previous Learning

This lesson is a hook and introduction to the unit. Previous knowledge is not required.

The initial part of the lesson is an interactive jousting and trivia game. This game acts as a "hook" to excite students for the rest of the unit. The trivia game also acts as a diagnostic assessment to determine what students already know about the Medieval Times. Next, students will engage in an inquiry-based exploration of Medieval times, focusing on the societal structure, the role of heraldry, and the daily life within early societies. By the end of the lesson, students will create a personalized medieval shield that represents aspects of their own identity or heritage.

Ontario Curriculum Expectations

Grade 4 Social Studies

A. Heritage and Identity: Early Societies to 1500 CE

A3. Understanding Context: Characteristics of Early Societies

- A3.2 demonstrate the ability to extract information on daily life in a few early societies from visual evidence.
- A3.3 describe significant aspects of daily life in a few early societies.

Learning Goals

- ✓ I can talk about different aspects of daily life during the Medieval Times.
- ✓ I can infer something about a Medieval society based on the heraldry and colours on their shields.

Materials

Trivia Game Materials:

- Trivia game Canva slides: https://www.canva.com/design/DAFwH3rlO2A/rvdLZmU30M1rpB1--xypQA/edit?utm_content=DAFwH3rlO2A&utm_campaign=designshare&utm_medium=link2&utm_source=sharebutton
- Completed shields for trivia game (4).



- Swords for trivia game (4).


- Pool noodle horses for trivia game (4)


- Foam rings, scotch tape, string, and wooden dowels for jousting part of trivia game (4 of each).


- Costumes (optional)

Resources for students to explore:

- **World History Encyclopedia**
  - https://www.worldhistory.org/Medieval_Heraldry/
    - Offers an in-depth look into medieval heraldry, exploring its origins, development, and significance. This resource is great for those seeking a comprehensive understanding of heraldry's role in medieval society, including its use in warfare, tournaments, and as a means of identification and family lineage. It delves into the symbolism behind heraldic colors, animals, and shapes, as well as the rules governing the design and inheritance of coats of arms.
  - https://www.worldhistory.org/Jousting/
- **Middle Ages for Kids by MrDonn.org**
  - https://medievaleurope.mrdonn.org/heraldry.html
  - A more accessible option for younger students or those looking for a simplified overview. It explains the basic concepts of heraldry and why it was important for medieval noble families to showcase their history and traits through symbols on banners, shields, and other items. This site is particularly user-friendly, with clear explanations and the potential to engage children in exploring their own family's heraldry or creating a coat of arms for themselves.
- **English Heritage**
  - https://www.english-heritage.org.uk/easter/preparing-for-easter-adventure-quests/our-guide-to-heraldry/
  - Provides a beginner's guide to heraldry that is both informative and practical. It outlines how heraldry started, the significance of colors and symbols, and the basic shapes used on heraldic shields. This guide is perfect for beginners of all ages who are interested in designing their own heraldry or coat of arms. It also encourages hands-on activities like making your own cardboard shield to apply and display your designs, offering a practical approach to understanding medieval heraldry.

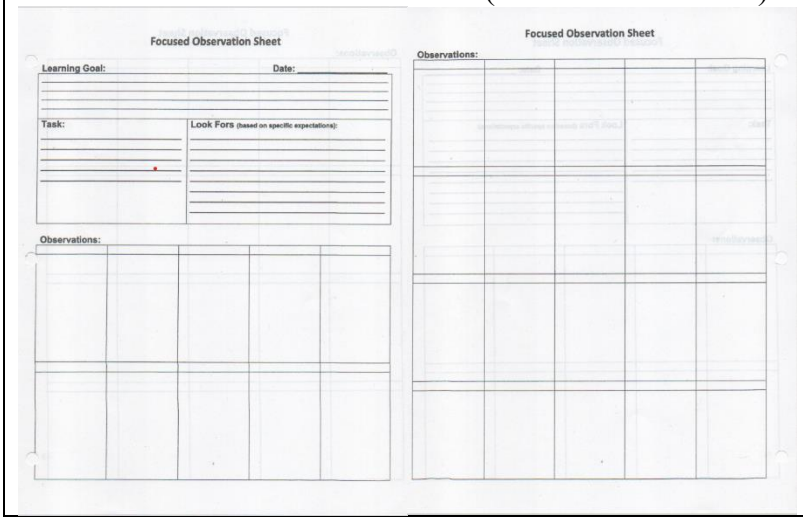
Materials for students to create their own shields:

- Cardboard
- Pencils
- Paint
- Markers
- Stickers and gems

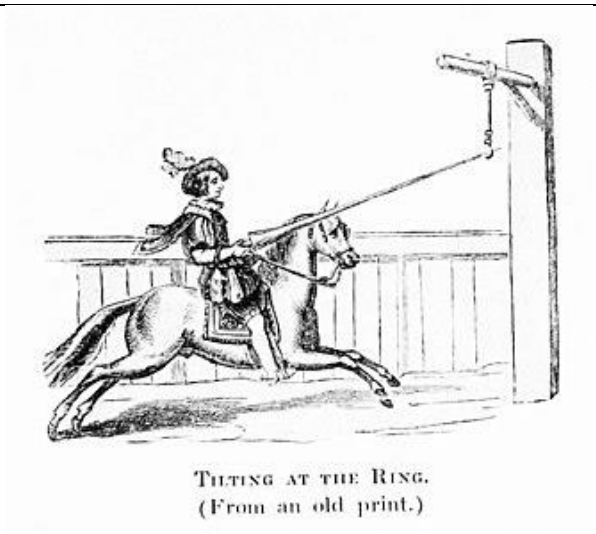
- Scissors
- Duct tape

Assessment Resources:

- Focused Observation Sheets (for assessment notes)



Activities
Anticipatory Set: *Start with an energetic greeting and show excitement about traveling back in time to the Medieval era. Dress in Medieval costume, if desired. Have Medieval music playing in the background when students walk in. The trivia game questions, and jousting game materials should be all ready to go.* **1. Hook: Medieval Times Trivia and "Tilting the Ring" Jousting Game** Timeframe: 10 minutes Group size: Whole group, class divided into 4 lines. • Set-up: The teacher will have the trivia questions projected on a screen at the front of the room. • Students will form 4 lines. • The first person in the line will move up and turn to face the rest of the line. They will hold a dowel out in front of them. Attached to the dowel is a foam ring, hanging by a piece of tape. • The next person in line will be given a pool noodle horse and a sword. Their job is to hook the ring with their sword and remove it from the dowel. • The first person (of the 4 line-groups) to remove the ring, gets to answer the trivia question. • Points will be awarded to each team for getting a trivia question correct.



TILTING AT THE RING.
(From an old print.)

2. **Shield Creation: Inquiry-Based Learning and Exploration**

Timeframe: 20 minutes
Group size: Individual or small group

- On their own, or in small groups, student will explore the resources provided about Medieval heraldry (see "materials" section).
- Students will select symbols and colours that represent personal traits, strengths, or family traditions.
- Using the symbols and colours that they have selected; students will create their own Medieval shields!
- As they craft their shields, encourage students to think about the meaning behind their choices and how these might relate to the concept of identity in Medieval times.

3. **Inquiry Questions and Reflection**

Timeframe: 10 minutes
Group size: Whole group

- Engage students in a discussion with thought-provoking questions related to the day's activities and trivia. Encourage them to consider:
    - Why were symbols and colors important in Medieval heraldry?
    - How did knights' duties and social roles influence the design of their coats of arms?
    - What symbols do you see in modern day? How do symbols in modern day compare to Medieval symbols and heraldry?
    - In what ways do our personal or family symbols today reflect our identity?

4. **Formative Assessment**

Timeframe: 10 minutes
Group size: Individual or small group presentations

- As a closure, each student will present their shield to the class, explaining the symbols and colors they chose and what they represent. This will help assess their understanding of the lesson's core concepts and their ability to connect personal identity with the historical context of heraldry.

Assessment

Assessment for Learning

- Observations of student participation and engagement.
- Pictures may be taken of student activities and work.
- Notes will be recorded on the Focused Observation Sheets.

Look for students demonstrating the following:

- ☐ Choosing shield colours and designs based on Medieval heraldry.
- ☐ Talking about daily life and activities during the Medieval Times.
- ☐ Active participation and engagement in activities.
- ☐ Co-operation and teamwork during activities.

Safety Considerations

- Prior to starting the trivia game, demonstrate safe handling of the pool noodle horses and foam swords to prevent accidents.
- There is lots of movement during the trivia game. Ensure students walk; don't run. Remind students to tie their shoelaces.
- Review scissor safety before students cut out their cardboard shield.
- Help students who may have difficulties cutting with scissors.

Accommodations and Modifications

Instructional accommodations:

- **Format:** Offer written instructions, visual aids, and verbal explanations of activities to cater to different learning preferences and needs.

Trivia game accommodations:

- **Alternate roles:** During the trivia game, alternate roles will be available for students with physical disabilities or those uncomfortable with physical activity. Alternative roles may include trivia question reader, scorekeeper, or the herald who announces participants.
- **Optional participation:** This lesson is very interactive. Students may opt out of any activity today, if they don't want to participate.

Shield design accommodations:

- **Technology:** Students may use digital resources, or books, during their research of Medieval heraldry. After exploring the provided resources, students have the option to create their shield using traditional materials (cardboard, paint, markers) or use digital tools (online design software). This allows students to choose the medium they are most comfortable with or interested in.
- **Group size:** Students may work individually or in a small group during their shield creation.

- **Materials:** For the shield creation activity, provide various templates and assistive tools (e.g., scissors with easy grips, adaptive software for digital design) to ensure all students can participate fully.

Next Steps
Next students will learn where Medieval societies were located on a map. • A3.1 identify the location of some early societies, including at least one First Nation and one Inuit society, on a globe or on print, digital, and/or interactive maps, and demonstrate the ability to extract information on early societies' relationship with the environment from thematic maps (e.g., climate, physical, topographical, vegetation maps).


Medieval Times
Gameday at Medieval Times | TV Commercial
Share
Watch on YouTube

Medival Times

Tourney Trivia

with Vanessa Li, Erika Nguyen,
Sam Park, and Marta Sokol

Question 1
What was the name of the code of conduct followed by knights during the Medieval Times?

A. The Knight's Code

B. The Chivalry Code

C. The Royal Code

D. The Armor Code

Question 1
What was the name of the code of conduct followed by knights during the Medieval Times?

A

B

C

D

The Chivalry Code

Question 2

What were the large, colorful flags or banners that displayed a knight's family crest or coat of arms called?

A Shields

B Tapestries

C Pennants

D Quilts

Question 2

What were the large, colorful flags or banners that displayed a knight's family crest or coat of arms called?

C Pennants

Question 3

What did peasants often give to the lord of the manor as a form of payment for living on his land?

A Candles

B Money

C Food and crops

D Jewelry

Question 3

What did peasants often give to the lord of the manor as a form of payment for living on his land?

C Food and crops

Question 4

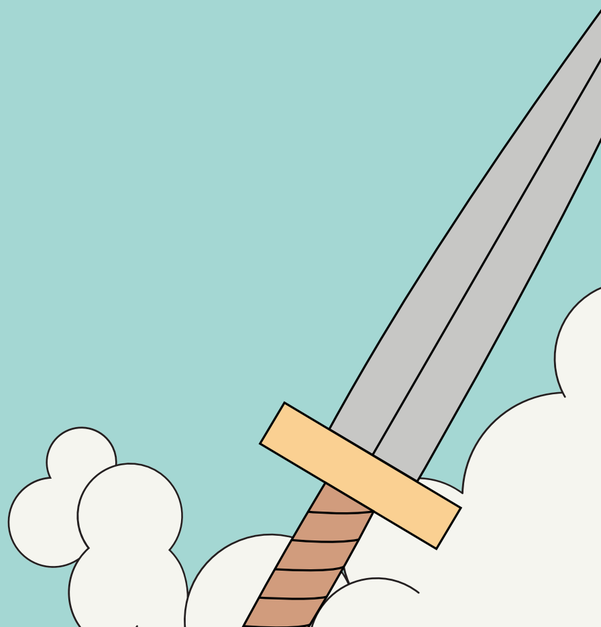
Which famous sword is said to have been stuck in a stone, and only the true king could pull it out?

A Excalibur

B Sword of the Round Table

C Longsword

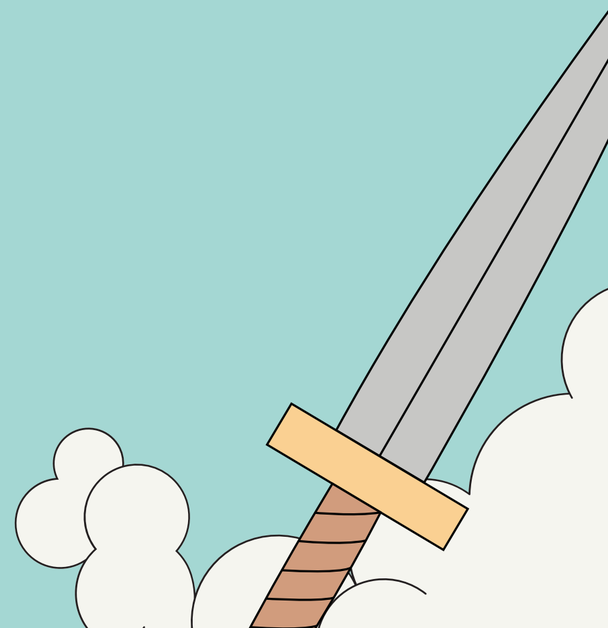
D King's Blade



Question 4

Which famous sword is said to have been stuck in a stone, and only the true king could pull it out?

A Excalibur



Question 5

What was the name of the deadly disease that spread through Europe during the Medieval Times, killing millions of people?

A The Black Plague

B The Red Fever

C The Green Death

D The Blue Sickness

Question 5

What was the name of the deadly disease that spread through Europe during the Medieval Times, killing millions of people?

A

The Black Plague

Question 6

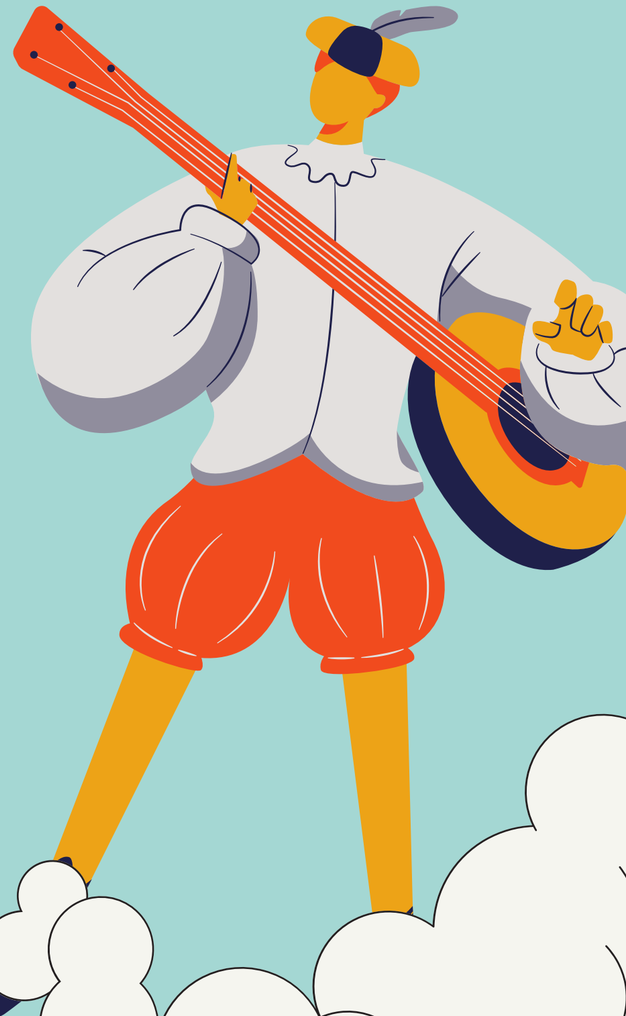
What type of music and poetry was popular during the Medieval Times?

A Rock and Roll

B Baroque

C Gregorian Chant

D Galante

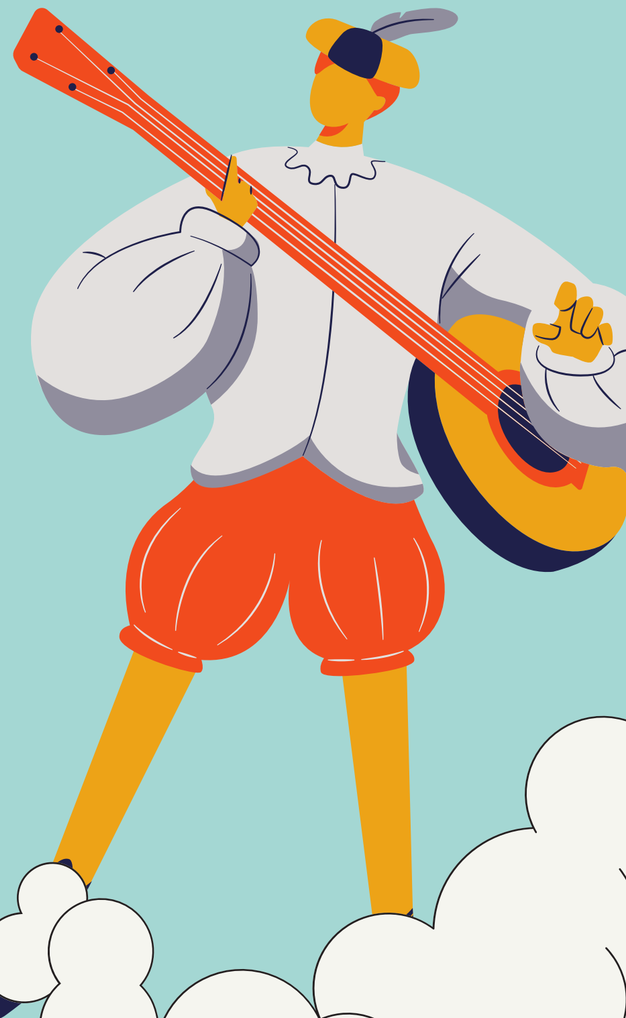


Question 6

What type of music and poetry was popular during the Medieval Times?

C

Gregorian Chant



Question 7

Which skilled craftsmen were responsible for creating intricate stained glass windows in Medieval cathedrals?

A Blacksmiths

B Masons

C Glassblowers

D Illuminators

Question 7

Which skilled craftsmen were responsible for creating intricate stained glass windows in Medieval cathedrals?

C Glassblowers

Question 8

What type of armor did knights wear to protect themselves in battle during the Medieval Times?

A Leather jackets

B Chainmail

C T-shirts and jeans

D Sweatshirts and hoodies

Question 8

What type of armor did knights wear to protect themselves in battle during the Medieval Times?

B

Chainmail

Question 9

What was the primary purpose of a moat surrounding a castle?

A. To keep the knights entertained

B. To provide water for the residents

C. To protect the castle from attackers

D. To create a space for fishing

Question 9
What was the primary purpose of a moat surrounding a castle?

C

To protect the castle from attackers

Question 10

Which Medieval building is known for its towering architecture and beautiful stained glass windows, often featuring stories from the Bible?

A. A tavern

B. A cottage

C. A cathedral

D. A blacksmith's forge

Question 10

Which Medieval building is known for its towering architecture and beautiful stained glass windows, often featuring stories from the Bible?

C A cathedral

Question 11

What was the main occupation of most people in Medieval villages?

A Blacksmithing

B Farming

C Jousting

D Potion-making

Question 11

What was the main occupation of most people in Medieval villages?

B

Farming

Question 12

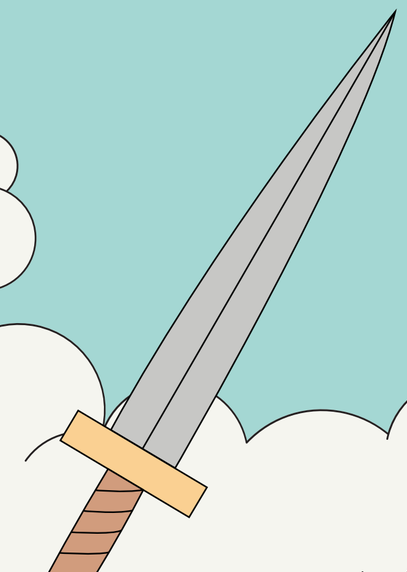
Which Medieval siege weapon was used to launch large stones or other projectiles at castle walls?

A Trebuchet

B Crossbow

C Sword

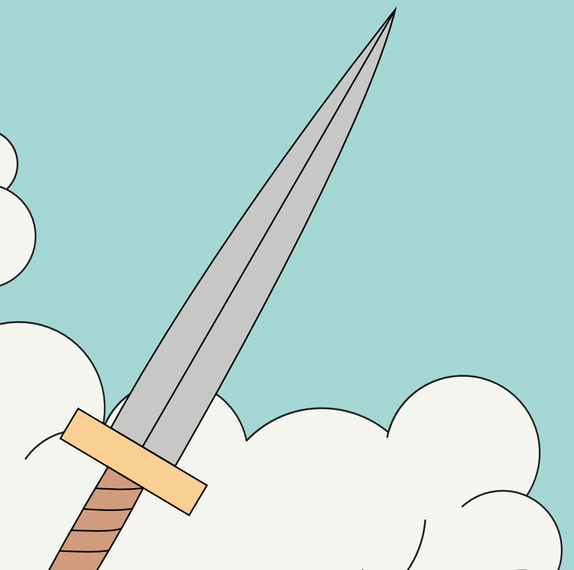
D Slingshot



Question 12

Which Medieval siege weapon was used to launch large stones or other projectiles at castle walls?

A Trebuchet



Question 13

What is the term for the economic and social system in Medieval Europe where land was exchanged for protection and labor?

A Democracy

B Serfdom

C Capitalism

D Feudalism

Question 13

What is the term for the economic and social system in Medieval Europe where land was exchanged for protection and labor?

Feudalism

Question 14
What was soap typically made of in Medieval Europe?

A Animal fat and Wood ash

B Beeswax and Potash

C Vegetable oils and Sodium Laurel Sulfate

D Olive oil and Salt

Question 14
What was soap typically made of in Medieval Europe?

A Animal fat and Wood ash

Question 15

For peasants, daily medieval farm life revolved around the ...

A Julian Calendar

B Agrarian Calendar

C Gregorian Calendar

D Liturgical Calendar

Question 15

For peasants, daily medieval farm life revolved around the ...

B Agrarian Calendar

Curriculum Connections

Grade 4: Expectations

Heritage and Identity: Early Societies to 1500 CE

Understanding Context: Characteristics of Early Societies demonstrate an understanding of key aspects of a few early societies (to 1500), each from a different region and era and representing a different culture, with reference to their political and social organization, daily life, and relationships with the environment and with each other

Learning Goal: Students will explore the culture and daily life of people in medieval European societies and compare it to their lives.

Virtual Field Trip Lesson Plan

Lesson Plan Information		
Teacher: Sam Park	**Date**: March 15, 2024	**Grade:** 4
Subject: Social Studies	**Timeframe:** 60 minutes	**Topic:** Virtual Field Trip with Google Arts and Culture

Overview and Previous Learning
This lesson is a virtual field trip where students will go back in time! In the lead-up to our virtual field trip, students have been exploring the broad tapestry of human history, focusing on how societies develop and interact with their environments. They've examined the basics of various ancient civilizations, learning about their innovations, cultural practices, and contributions to the world. This lesson serves as a practical application of their knowledge, using interactive digital resources to delve deeper into the daily lives and artistic achievements of the Aztecs, Ancient Egyptians, and Native cultures. It builds on their understanding of historical timelines, geographical impacts on civilizations, and the importance of cultural heritage and identity.

Ontario Curriculum Expectations
Grade 4 Social Studies **A. Heritage and Identity: Early Societies to 1500 CE** • A1.2 compare aspects of the daily lives of different groups within a few early societies. • A3.3 describe significant aspects of daily life in a few early societies. **Cross Curricular Connections** Drama • B1.1 engage actively in drama exploration and role play, with a focus on exploring drama structures, key ideas, and pivotal moments in their own stories and stories from diverse communities, times, and places. Art • D3.1 describe how visual art forms and styles represent various messages and contexts in the past and present. • D3.2 demonstrate an awareness of a variety of art forms, styles, and traditions, and describe how they reflect the diverse cultures, times, and places in which they were made. Language Online Safety, Well-Being, and Etiquette • A2.2 demonstrate an understanding of how to navigate online environments safely, manage their privacy and personal data, and interact in a way that supports their well-being and that of others, including seeking appropriate permission.

Lesson Objectives

- Students will explore and learn about ancient civilizations, including the Aztecs, Ancient Egypt, and Native cultures.
- Students will engage with interactive digital resources to enhance their understanding of historical and cultural contexts.
- Students will develop critical thinking and analytical skills by discussing the causes and consequences of events in ancient history.
- Students will express their creativity through digital sculpting and puzzle-solving activities.

Learning Goals

- ✓ I can describe different aspects of daily life from ancient societies.
- ✓ I can compare different aspects of daily life from ancient societies.
- ✓ I can engage in drama and role play and pretend to go back in time.
- ✓ I can view and describe different art forms from the past.
- ✓ I can use the internet safety and responsibly.

Materials

- Internet-connected devices for each student or group (PC, laptop, tablet)
- Projector and screen for class demonstrations
- Presentation slides
- Links to Google Arts and Culture resources and activities
- Exit ticket (Padlet link, or student Social Studies journals)

Preparation

- Ensure all links to Google Arts and Culture are accessible and functioning.
- Preview the virtual tours and interactive activities to plan for any instructional guidance the students might need.

Activities

1. **Introduction and Hype-up**
   Timeframe: 5 minutes *(also build anticipation throughout the day!)*
   Group size: Whole group
   - Introduce the concept of a virtual field trip and explain that the class will be exploring ancient civilizations using Google Arts and Culture.
   - *Really hype the students up: "We are going back in time!" "We are going on a virtual field trip, and we are going to build digital pots!"*
   - Have a brief discussion on the importance of studying ancient civilizations and their impact on modern society.

2. **Guided Virtual Tour of Ancient Civilizations**
   Timeframe: 20 minutes

Group size: Whole group

- *Dramatic element: Wear a headset and be their tour guide for the day!*
- *Dramatic element: Have all the students stand up and act out getting into their pretend time machine, buckling up their seatbelt, pressing the go button, and flying off into the past!*
- Start the virtual tour with the Aztecs using the provided link. Guide the students through the virtual exhibit, pointing out significant artifacts and discussing their historical context.
- *Dramatic element: Get back into time machine!*
- Continue with the tour of Ancient Egypt. Use the street view feature to explore the National Museum in Scotland's exhibit on Ancient Egypt.
- *Dramatic element: Get back into time machine again!*
- Finish with the exploration of Native cultures, highlighting their traditions, innovations, and contributions to humanity.

3. **Interactive Activities**
   Timeframe: 20 minutes
   Group size: Small groups
   - Have the students divide themselves into small groups or assign them to groups (up to the teacher's discretion).
   - *Safety note: Remind students to stay on the approved sites and not to share personal information online. Discuss the importance of digital citizenship.*
   - Assign each group an interactive activity on Google Arts and Culture, or let the students explore and choose an activity.
     - **3D Pottery**: Students sculpt their own historical pot, exploring ancient art techniques.
     - **Puzzle Party** - Wonders of Mexico: Students work together to solve puzzles featuring wonders of Mexico, promoting teamwork and problem-solving skills.
     - **What Came First?** Explore Cultural Moments in Time: An interactive game that challenges students to place historical events in chronological order, enhancing their understanding of historical timelines.

4. **Discussion and Reflection**
   Timeframe: 10 minutes
   Group size: Whole group
   - Regroup as a class and discuss the virtual field trip. Ask students to share what they found most interesting about the ancient civilizations they explored.
   - Reflect on the interactive activities. Discuss the skills students used and what they learned from the experience.

5. **Conclusion**
   Timeframe: 5 minutes
   Group size: Whole group
   - Summarize the key learnings from the lesson and encourage students to explore Google Arts and Culture more on their own time.

- Have students complete a quick exit ticket. They can write in their Social Studies journals, or the teacher can create a Padlet.

Assessment

Exit Ticket on Padlet or paper.

- Students will write in their Social Studies journal, or answer on a Padlet.
- Questions to consider:
  - What was your favourite part of the virtual field trip?
  - What is something you want to know more about? Think of any questions you have related to an ancient civilization that you saw today.
  - What was similar about the different societies? What was different?
  - What did you notice about the different artwork and pottery from the different cultures and ancient civilizations?
- When assessing the exit ticket, look for clarity of expression, depth of reflection, and engagement with the material.

Safety Considerations

Internet Safety

- Remind students not to veer from the links provided.
- Ensure there are safety settings enabled on student devices.

Accommodations and Modifications

- **For students with visual impairments:** Provide auditory descriptions of the virtual tours and interactive activities. Consider using screen reader-friendly materials or providing alternative assignments that involve more tactile or auditory learning.
- **For students with hearing impairments:** Ensure that any video content has subtitles. Offer written descriptions or summaries of any auditory components of the lesson.
- **For ESL students:** Provide vocabulary lists ahead of time and ensure instructions are clear and simple. Consider pairing ESL students with buddies who can help navigate any language barriers during activities.

Next Steps

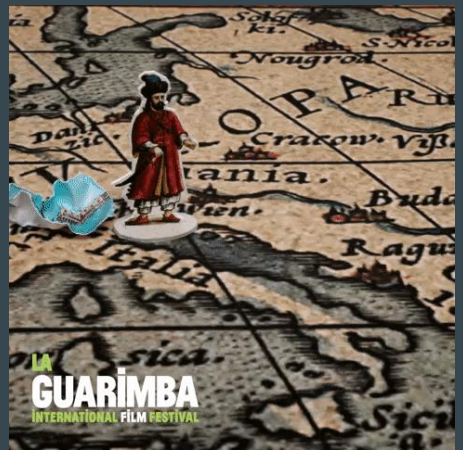
Options:

- **Inquiry-Based Learning Project**
  - Using the questions students wondered about in their exit ticket, there could be a follow-up project to this lesson. Students could explore an ancient civilization further, allowing them to dive deeper into a topic of interest. Then, they could present their information and learning in a creative manner (e.g., drama skit, poster board, digital slideshow, etc.)
- **Creative Writing Project**

- Students could engage in a creative writing assignment where they write a short story or diary entry from the perspective of someone living in one of the ancient societies they learned about.

A Virtual Trip to Ancient Civilizations

...



Aztec and Mayan Ruins:
https://artsandculture.google.com/story/vAVxYKhbMp5deg

•••

On this expedition, you will visit Chichen Itza, Teotenango, the Aztec Ruins National Monument, Chaccoben and Teotihuacan.

National Museum in Scotland to see Ancient Egypt

•••

https://artsandculture.google.com/streetview/ancient-egypt-rediscovered/iwEdtU9S6btPwA?sv_lng=-3.1894332348468 37&sv_lat=55.9469407506845 26&sv_h=123.11267729682359&sv_p=3.3437417726522 51&sv_pid=oUr6dcrQY6kAAARDz-M00w&sv_z=2.055206195748 8004

3D Pottery. Sculpt your own historical pot.

https://artsandculture.google.com/experiment/3d-pottery/nwHg1D0riJ1ltA

Puzzle Party - Wonders of Mexico

https://artsandculture.google.com/experiment/puzzle-party-%E2%80%94-wonders-of-mexico-edition/SgGFEAtQP-NU7w?cp=eyJwdXp6bGVJZCI6Il9pY2F6dmc1Y3giLCJnYWxsZXJ5IjoibWV4aWNvIn0.

https://artsandculture.google.com/experiment/puzzle-party-%E2%80%94-wonders-of-mexico-edition/SgGFEAtQP-NU7w?cp=eyJwdXp6bGVJZCI6Il90bXpsc2FxNm4iLCJnYWxsZXJ5IjoibWV4aWNvIn0.

What Came First? Explore Cultural Moments in Time!

https://artsandculture.google.com/experiment/what-came-first/ZQGBUPErEE3bVg

Bear Paw Lesson Plan

Lesson Plan Information		
Teacher: Sam Park	**Date**: March 15, 2024	**Grade:** 6
Subject: Social Studies	**Timeframe:** 50 minutes	**Topic:** Bear Paw Mining

Overview and Previous Learning

This lesson is a hook and introduction to the unit. Previous knowledge is not required.

Overview:

This lesson serves as a dynamic introduction to our unit on "People and Environments: Canada's Interactions with the Global Community," specifically focusing on the subtopic of "Bear Paw Mining." This engaging and hands-on activity is designed not only to capture the students' interest but also to lay the foundational understanding of the complex relationship between human activities and environmental impacts. Through the metaphor of mining chocolate chips from cookies, students will explore concepts of resource extraction, environmental degradation, and the socio-economic and political dimensions of mining.

Previous Learning:

Prior to this lesson, students may not have formal education on the specifics of mining or its environmental impacts, making this an introductory experience. However, this lesson ties into broader themes that students have explored in earlier grades, such as community and environmental stewardship. We build upon their understanding that communities must make decisions about how to use land and resources, and that these decisions can have far-reaching consequences for the environment and society.

Students have previously engaged in discussions about personal responsibility and collective actions towards the environment, such as recycling and conservation efforts. They have learned about ecosystems, biodiversity, and basic economic concepts through various subjects, providing a base from which to understand the more focused study of mining's impact on environments and communities.

Ontario Curriculum Expectations

Grade 6 Social Studies
B. People and Environments: Canada's Interactions with the Global Community

B2. Inquiry: Responses to Global Issues

- **B2.1** formulate questions to guide investigations into global issues of political, social, economic, and/or environmental importance.

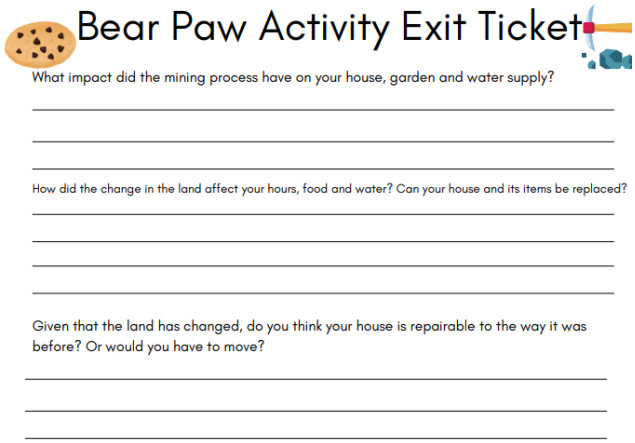
Learning Goals
✓ I can ask and respond to questions about issues in my environment and world. o I can ask questions about mining, and how it is of political, social, economic, and environmental importance. o I can investigate and find the answers to my questions about mining.

Materials

Teaching Resources

- Canva slides, computer, projector

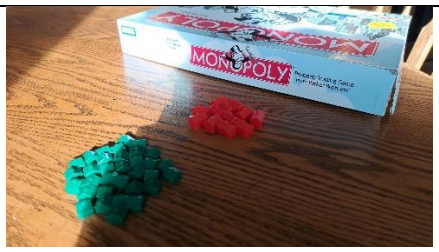
- Exit ticket (for assessment)



Activity Materials

- Bear Paw cookies (with chocolate chips)

- Game board pieces (e.g., Monopoly houses)



- Green construction paper (for gardens)
- Toothpicks (as mining tools)
- Pipe cleaners (to represent water streams)
- Coffee filters (to put Bear Paws cookies on)

Activities

Set-up: The materials for this activity should be ready to go, before you begin the lesson.

1. **Introduction to the Unit**
   Timeframe: 10 minutes
   Group size: Whole group.
   - Discuss the "Big Idea" of the unit focusing on investigation, inquiry, and the impact of our actions on the world.
   - Introduce the guiding question: "How do you impact the world around you?"

2. **Bear Paw Activity**
   Timeframe: 30 minutes (Setup: 5 minutes, Mining: 10 minutes, Discussion: 15 minutes)
   Group size: Whole group.
   Note: Further details are in the presentation slides.
   - Read the “Introduction Story” to set the mood and give context (see presentation slides).
   - First, students will place their Bear Paw cookie (land) on the coffee filter and trace their Bear Paw with pencil. Then, they will build their house (game board piece), stream (pipe cleaner) and garden (green construction paper).
   - Once their land is all set-up, students will now change roles from a landowner to a mining company. Students will all stand up and move to the Bear Paw land next to them. They need to bring their mining tools (toothpick with them).
   - With their toothpick (pickaxe), students will try to mine the minerals (chocolate chips) from the land (Bear Paw). They want to mine as many chocolate chips as they can in one minute.

- After 10 minutes, students will return to their land and home. They will return their structures to their original location, if they moved.
- At the end of the activity, have a discussion on the activity's impact on their "land," "water supply," and "garden," relating it to real-world environmental issues.

Discussion Questions:

- Was it easy or difficult to remove the chocolate chips from the cookie?
- What happened to the land around the chocolate ships while you were trying to get them out?
- As the mining company, did you try to minimize the damage knowing it was someone else's land? Or were you focused only on getting the chips out?
- What impact did the mining process have on your house, garden, and water supply?
- How did the change in the land affect your hours, food, and water? Can your house and its items be replaced?
- Given that the land has changed, do you think your house is repairable to the way it was before? Or would you have to move?
- If the cookie debris and small pieces of chocolate chips represent pollution, chemicals, and waste from the mine, what impact would this have on your food and water supply? What impacts would this have on your whole community?
- Who should be responsible to fix your house, clean the pollution and restore your community? Why?
- Who would you turn to for help? Who has the responsibility to listen to you, and to ensure that things are made better? Who should hold the company accountable for the damage it caused?

3. **Exit Ticket**
   Timeframe: 10 minutes
   Group size: Individual or small group.
   - Have students complete an exit ticket to consolidate learning on the implications of resource extraction and pollution.
   - Reinforce the idea that our actions have a global impact and that understanding and addressing global issues requires thoughtful inquiry and collective action.

Assessment
Exit Ticket • The exit ticket may be printed, or digital.   ○ Digital option: For the exit ticket, digital platforms such as Google Classroom or Padlet could be used to collect responses. This can facilitate a review of students' understanding and allow for a quicker turnaround in providing feedback.

Safety Considerations
• **Allergy Awareness:** Ensure no students have allergies related to the materials used, especially if using real food items like chocolate chips. Consider alternative materials if allergies are present. • **Use of Tools:** Supervise the use of toothpicks as mining tools to prevent accidental injury. Establish clear rules for their safe use. • **Cleanliness and Hygiene:** Encourage students to wash their hands before and after the activity, especially if food items are used. Keep the workspace clean to avoid attracting pests.

Accommodations and Modifications
• **For students with physical disabilities:** Provide adapted tools for mining that are easier to handle or allow them to direct a peer in mining activities. • **For students with learning difficulties:** Offer simplified instructions or visual aids to help them follow the activity steps. Pair these students with peers who can assist them through the process. • **For gifted students:** Encourage them to think critically about the environmental impact of mining in real life and propose innovative solutions to minimize damage during the activity.

Next Steps
• **Reflection and Sharing:** Allocate the next session for students to share their thoughts on the Bear Paw activity and discuss real-world applications of the concepts learned. • **Biome Viewer Activity Preparation:** Instruct students to bring their laptops or tablets for the next lesson if they have them. Prepare a brief tutorial on how to use the Biome Viewer online tool. • **Introduction to IBL Project**: Begin the next session with an overview of the inquiry-based learning project, including expectations, timelines, and examples of global issues students might choose to investigate. **Next Lesson: Biome Viewer and IBL Project Introduction** • Curriculum focus: B2.2 • Students will use Biome Viewer online to gather information about global ecological patterns created by human interactions within ecosystems. Students can consider the environmental impact of increasing human populations and the spread of urbanization. They can use Excel to graph or organize this information in a meaningful way. Other methods of presenting their understanding are acceptable.

Bear Paw Activity Exit Ticket

What impact did the mining process have on your house, garden and water supply?

How did the change in the land affect your hours, food and water? Can your house and its items be replaced?

Given that the land has changed, do you think your house is repairable to the way it was before? Or would you have to move?

If the cookie debris and small pieces of chocolate chips represent pollution, chemicals, and waste from the mine, what impact would this have on your food and water supply? What impacts would this have on your whole community?

Who should be responsible to fix your house, clean the pollution and restore your community? Why?

Who would you turn to for help? Who has the responsibility to listen to you, and to ensure that things are made better? Who should hold the company accountable for the damage it caused?

People and Environments

Canada's Interactions with the Global Community

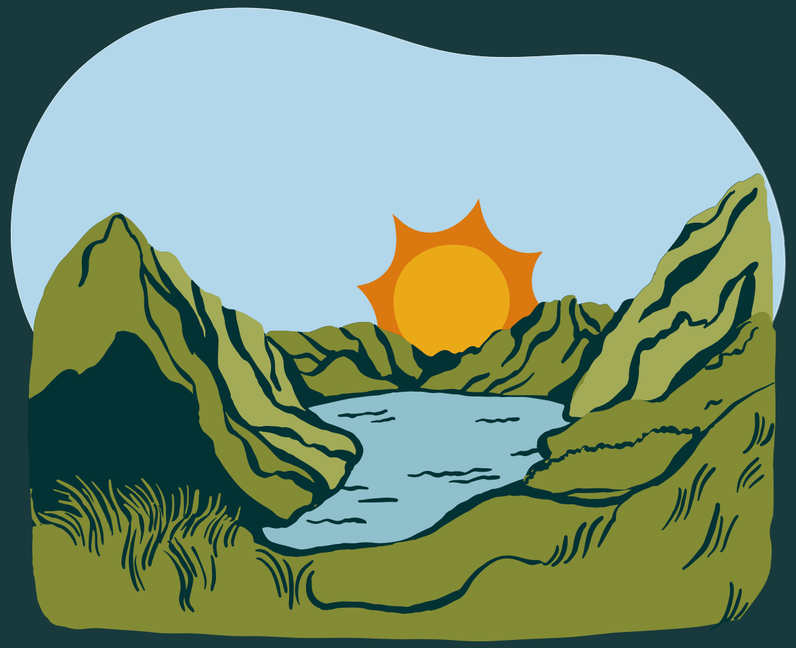
Grade 6 Social Studies

Sam P., Marta S., Erika N., Vanessa L.

The Big Idea

During this unit, students will learn specific facts about certain global issues. Although these facts will all be related to the topic of global issues, the main purpose is to teach students to investigate and inquire about topics of their choosing. Ultimately, students will engage with concepts such as interconnectedness, global communities, causes and consequences, and cumulative actions, which will lead to a more generalized understanding and application.

Keywords: *Inquiry, Interconnectedness, Global communities, Cause and consequence, Cumulative actions*



Grade 6 Curriculum

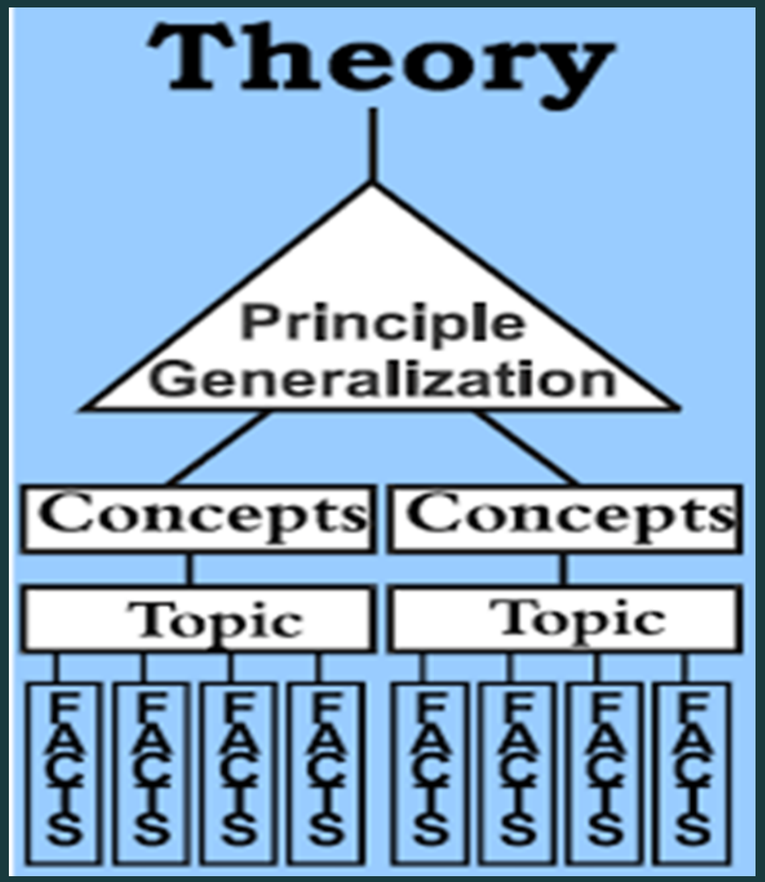
Expectations:

B. People and Environments: Canada's Interactions with the Global Community

- **B2.** Inquiry: Responses to Global Issues

Specific Curriculum Expectations:

- *B2.1, B2.2, B2.3, B2.4, B2.5, B2.6*



Concepts

- Inquiry
- Interconnectedness
- Global communities
- Cause and consequence
- Cumulative actions

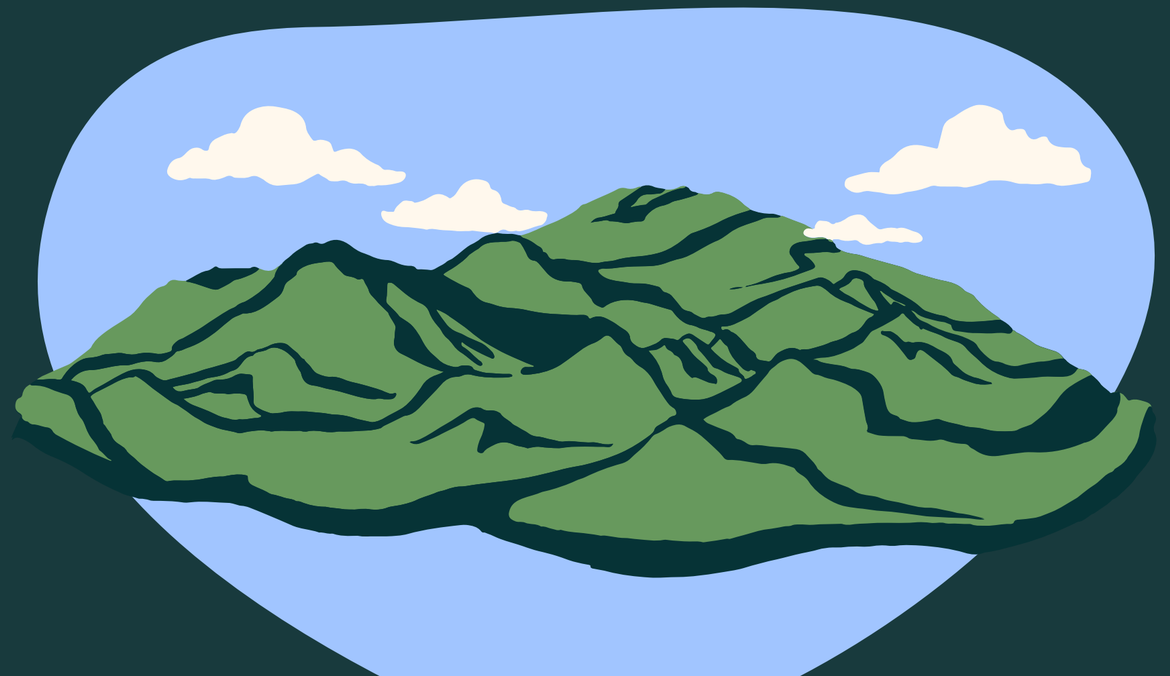
Guiding unit question:

How do you impact the world around you?

Let’s discuss!

Today's Goal

I can ask and respond to questions about issues in my environment and world.



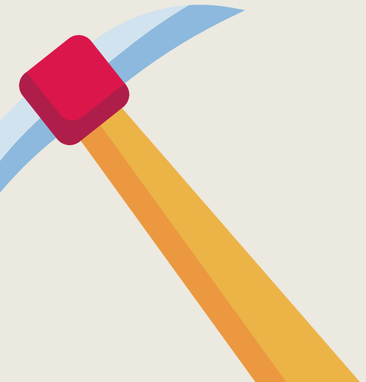
Introduction Story

For the last few years, you have been living in a settlement that you built on a land rich in the beauty of nature. It has been largely untouched by industry, and you have long learned to appreciate and live alongside the natural environment.

However, you soon hear word that a mining company has become interested in the resources the land around you has to offer...

Your Land


Bear Paws
Pattes d'ours
MADE WITH REAL
CHOCOLATE CHIPS
FAIT AVEC DE VRAIES
PÉPITES DE CHOCOLAT



Valuable Resource Found!

Chocolate chips have recently been found to be very valuable and a mining company has purchased a permit from the government to mine the chocolate chips from each student’s land.

On Your Land You Have...

Resources:	Represented By:
Your Land	Bearpaw
Your house	Monoply House
Your Garden	Construction Paper
Minerals	Chocolate Chips
Mining Tools	Toothpicks
Water	Pipe cleaner

Instructions

First, you will place your bear paw (land) on the piece of coffee filter and trace your bear paw. Then you will build your house (game board piece), stream (pipe cleaner) and garden (green construction paper).

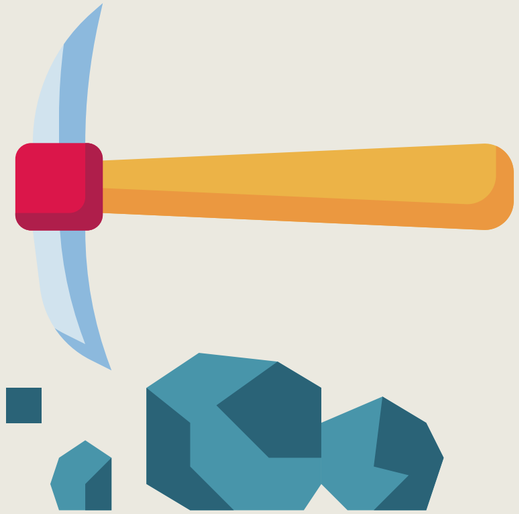
Instructions

Next, you will become a mining company on another person's land. Move over to the land next to you.

Instructions

With your toothpick (pick axe), try to mine the minerals (chocolate chips) from the land (Bear Paw).

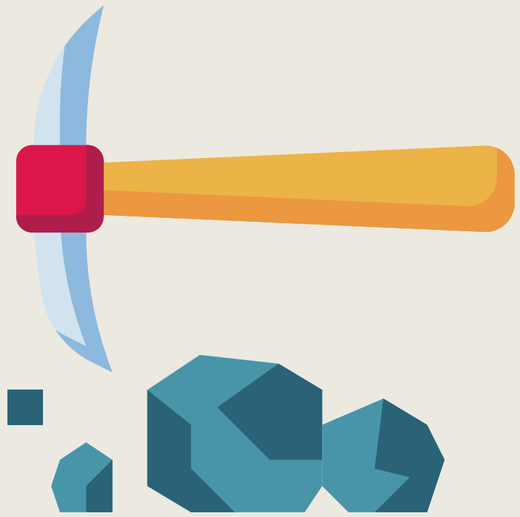
Mine as many chocolate chips as you can in one minute!



Rules

1. You can only use the toothpick to mine. No hands.
2. Place the chocolate chips that you mine in the corner of the land.

Let’s Start Mining!



Let’s Take a Look

Was it easy or difficult to remove the chocolate chips from the cookie?

What happened to the land around the chocolate ships while you were trying to get them out?

As the mining company, did you try to minimize the damage knowing it was someone else’s land? Or were you focused only on getting the chips out?

Return Home

After 10 minutes, you will return to your land and home. Return your structures to their original location, if they moved.

Return Home

What do you notice?
How do you feel?

Let's Discuss

What impact did the mining process have on your house, garden and water supply?

How did the change in the land affect your hours, food and water? Can your house and its items be replaced?

Given that the land has changed, do you think your house is repairable to the way it was before? Or would you have to move?

Let's Discuss - Continued

If the cookie debris and small pieces of chocolate chips represent pollution, chemicals, and waste from the mine, what impact would this have on your food and water supply? What impacts would this have on your whole community?

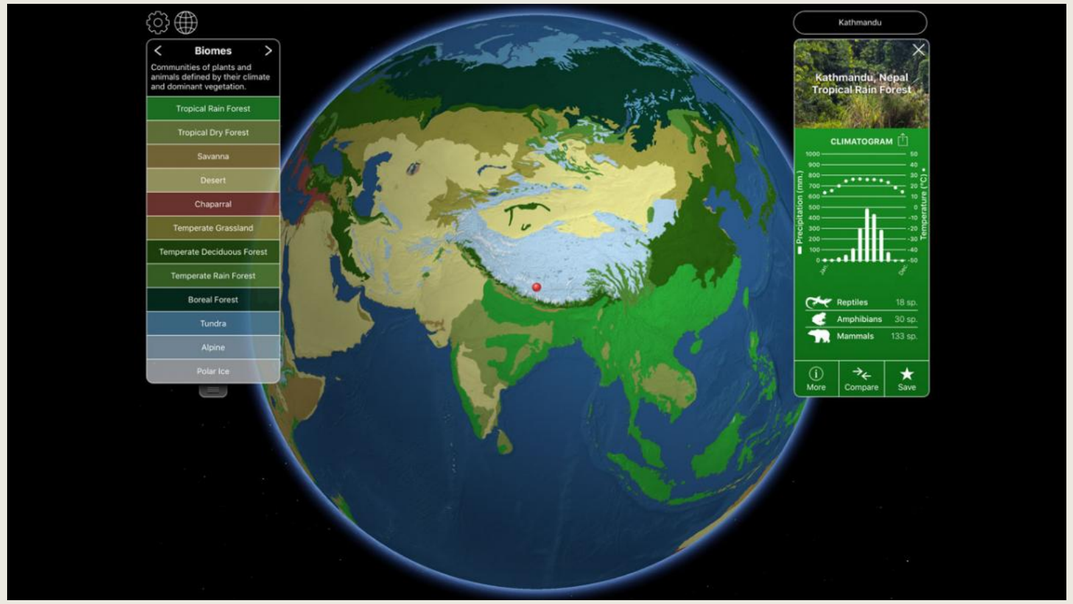
Who should be responsible to fix your house, clean the pollution and restore your community? Why?

Who would you turn to for help? Who has the responsibility to listen to you, and to ensure that things are made better? Who should hold the company accountable for the damage it caused?

Next Steps...

Next Lesson: Biome Viewer!

Anthromes over time investigation



Students will use Biome Viewer online to gather information about global ecological patterns created by human interactions within ecosystems. Students can consider the environmental impact of increasing human populations and the spread of urbanization. They can use Excel to graph or organize this information in a meaningful way. Other methods of presenting their understanding are acceptable.

Unit Activities

B2.1

Hook
Bear Paw Activity

B2.2

BiomeViewer &
project introduction

B2.3

Google My Maps
Activity

B2.4

Extension of My
Maps Activity

B2.5

Global Issue
Extploration
Activity

B2.6

Project presentations
Consolidation

Final Project

Students will choose a global issue of political, social, economic, and/or environmental importance to investigate with a group. First students will brainstorm ideas and questions to investigate. This project will be student-driven, and inquiry based. Findings will be presented at the end of the unit, using any method that the students choose.

Assessment and Evaluation

- Exit ticket per lesson
- IBL Project

Consolidation and Enduring Understanding

- IBL Project
- Final discussion

Let‘s consider this again!

How do you impact the world around you?

How can we make positive changes?

The End

other

Lesson Plans and Resources

CREATURES IN MOTION

COUNTING ON PEOPLE
K-5 Activities for Global Citizenship

METHOD

Students participate in physical but noncompetitive games that illustrate the challenges that arise when working as a large group.

MATERIALS

• None

CONCEPT

Cooperation becomes increasingly important when more people engage in activities together.

GRADE LEVEL

Lower elementary

SUBJECTS

Social Studies, Science, Language Arts

OBJECTIVES

Students will be able to:

• Demonstrate how members of a group can work cooperatively to achieve a goal.
• Explain the challenges of group cooperation.

SKILLS

Cooperating, group problem solving, brainstorming, descriptive writing

INTRODUCTION

When working as a group, cooperation is necessary to achieve common goals. Some activities work better with just a few people, while others work better with lots of people. In the first part of this activity, students participate in a physical but noncompetitive game in which they demonstrate the problem-solving and cooperative skills needed to work in large groups. In the second part of the activity, students will demonstrate coordination as a team in creating a four-person creature that can move together as a unit.

PART 1: MILLIPEDE STAMPEDE

PROCEDURE

The challenge of this activity is for the group to move like a millipede for a few moments. This will take both cooperation and coordination from every student. Begin by asking the class if they know what a millipede is. Below is a brief description. It would also help to have a visual to show them. You can bring up a photo or video from a web search. A video clip (available on YouTube, for example) that shows the millipede moving would be especially helpful for the activity that follows.

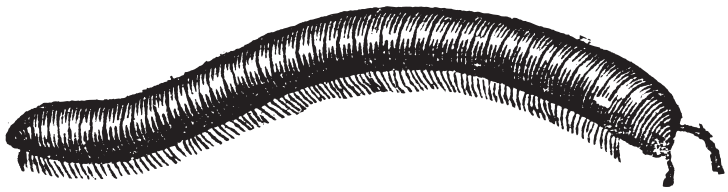
"A millipede is an arthropod, an animal with lots of legs and a segmented body (spiders and crabs are also arthropods). Millipedes are more commonly called "thousand leggers" although most species have about 40-400 legs. Their bodies have many segments with two pairs of legs on each segment. The movement of all those legs is well-coordinated. They move their legs in a wave-like motion to move forward or backward. We're going to try and do that together to find out how easy or difficult it is to work together in this way."

1. Direct the students to form a line. (The longer the line, the more fun and challenging the activity.) Each person in line should put his/her hands on the shoulders of the person in front of them, keeping arms straight, so each student is one arm's length apart. Everyone becomes part of the millipede. The leader of the group will be the head of the millipede.

   Note: You could also start with a smaller group of students and add more to the millipede line as the activity progresses.

2. Explain that at your signal, the "millipede" should begin to walk as instructed by the first person in the line (the "head" of the millipede). The segments (students) should remain one arm's length apart, and no more. If any segment separates, the rhythm will be broken.

3. Give the signal for the millipede to start walking. One to three minutes of the activity should be enough to demonstrate the "millipede's" ability to work together.



DISCUSSION QUESTIONS

1. How does moving like a millipede compare to walking by yourself?

2. How would you like to walk to school every day as part of a millipede of people?

3. Imagine if your whole school had to move together like that. Would it be hard to do that with many people?

4. What would happen if a segment of the millipede (one person) started to do its own thing and didn't stay in sync with the rest of the group?

5. When are some things easier, or maybe even only possible, if you have a small group of people? What activities are more appropriate for a large group of people? Go through this list below (and perhaps add some of your own), and have the students indicate with a show of hands whether they'd prefer doing the activity with more or fewer people.

a. Grocery shopping
b. Standing in the lunch line
c. Attending a baseball game
d. Swimming in the pool
e. Working in class
f. Riding a bus
g. Eating a snack
h. Napping
i. Playing tug-of-war
j. Celebrating at birthday parties
k. Playing games at an arcade
l. Watching a parade (or marching in a parade)
m. Playing at the playground
n. Cooking in the kitchen

PART 2: CREATE-A-CREATURE

PROCEDURE

1. Divide the class into teams of four students each.

2. Inform the teams that each group will become a single, moving creature of its own creation (but one that is different from the millipede). The movement of the creature will only work if everyone is cooperating and working together. Each member of the group must be in contact with the person next to him or her, and all four students must move together so that all parts of the creature function as one unit. Students must decide how their creature will move (ex. hopping like a frog or wiggling like a snake). Students can get creative and name their creatures, describe where they live, and what they eat.

3. Allow 10-15 minutes for each team to create its creature. During the brainstorming period, each group will test its creature's ability to move a pre-determined distance (a few feet or the length of a hallway, for example) successfully.

4. Finally, each group will present its creature to the class and demonstrate how it moves.

DISCUSSION QUESTIONS

1. What challenges did you have moving as a team? How did you solve them?

2. Why did the creatures have to move together in the same motion and at the same time?

3. Was it hard to do exactly what the person next to you or in front of you was doing? Why? Did you choose a leader?

4. When else do groups of people need to cooperate?

Answers will vary but may include: waiting in line, observing driving laws, playing games, playing in a band or singing in a chorus, etc.

5. What insects or animals have to move and work together to survive?

Examples could include bees and ants.

MEASURING LEARNING

Have students write 3-5 sentences about the creature they created with their classmates, explaining the challenges of cooperating to move as one unit. They can include details about their creature, such as its name, where it lives, how it moves, what it eats, and how it defends itself from predators. They can also draw a picture of the creature.

FOLLOW-UP ACTIVITY

As populations grow and more people live together in one space (like the growth of cities), there are more situations in which people need to cooperate in order to prevent chaos. For instance, to promote safety, there are more laws regulating driving (speed limits, traffic lights, etc.). There also may be rules that govern how we behave in groups – like not cutting in line or sharing space in the park or swimming pool. Today, more than half of the world's people live in cities. Lead a discussion with the class of some of the pros and cons of living in densely populated cities. List student answers on the board.

UNIT 3 | HOW MANY IS ENOUGH?

EARTH COOKIE

METHOD

A cookie is decorated to show the different features of the Earth's surface and the amount of farmland being used on Earth.

MATERIALS

- Large, pizza-sized sugar cookie (bake at home or purchase in advance)
- Assortment of cookie toppings: raisins, dried fruit, sliced berries, miniature marshmallows, small candies and sugar sprinkles, etc.
- Animal crackers
- Black dessert decorating gel/icing
- White frosting or cream cheese
- Food coloring (blue and green)
- Plastic knife
- Student Pie Chart (provided, optional)
- Markers (optional)

NOTE: If you would rather not use food products, use modeling clay to make the cookie and craft supplies like beads, paper, and buttons for the toppings.

INTRODUCTION

Whether fruit, beans, cheese, cereal or meat, the food we eat originates in the soil. Only a small part of the Earth's land is available to grow food to feed the world's people. The decisions we each make and our actions can help conserve farmland and decrease food waste. We must work together to keep the Earth's soil healthy.

PROCEDURE

1. Prior to class, make blue icing by mixing white frosting with a few drops of blue food coloring. Spread blue icing on 3/4 of the cookie and white frosting on the remaining 1/4.

2. Ask students to share what they ate for breakfast that morning and write responses on the board.

3. Pick a few of the students' responses, and as a class, discuss where each food came from (a tree, grains from a farm, an animal, etc.).

COUNTING ON PEOPLE
K-5 Activities for Global Citizenship

CONCEPT

The food that we eat comes from farmland, and it is important to protect it so that we can preserve land for wild areas.

GRADE LEVEL

Lower elementary

SUBJECTS

Science, Social Studies, Math

OBJECTIVES

Students will be able to:

- List three foods that come from farmland.
- Describe how much of the Earth's surface is land and how much of that land is used for farming.
- Name two things that people can do to preserve farmland.

SKILLS

Observing, analyzing a pie chart, understanding fractions, categorizing, understanding cause and effect

4. Tell students that the land used to grow food, either for plants or for raising animals that we eat, is called farmland.

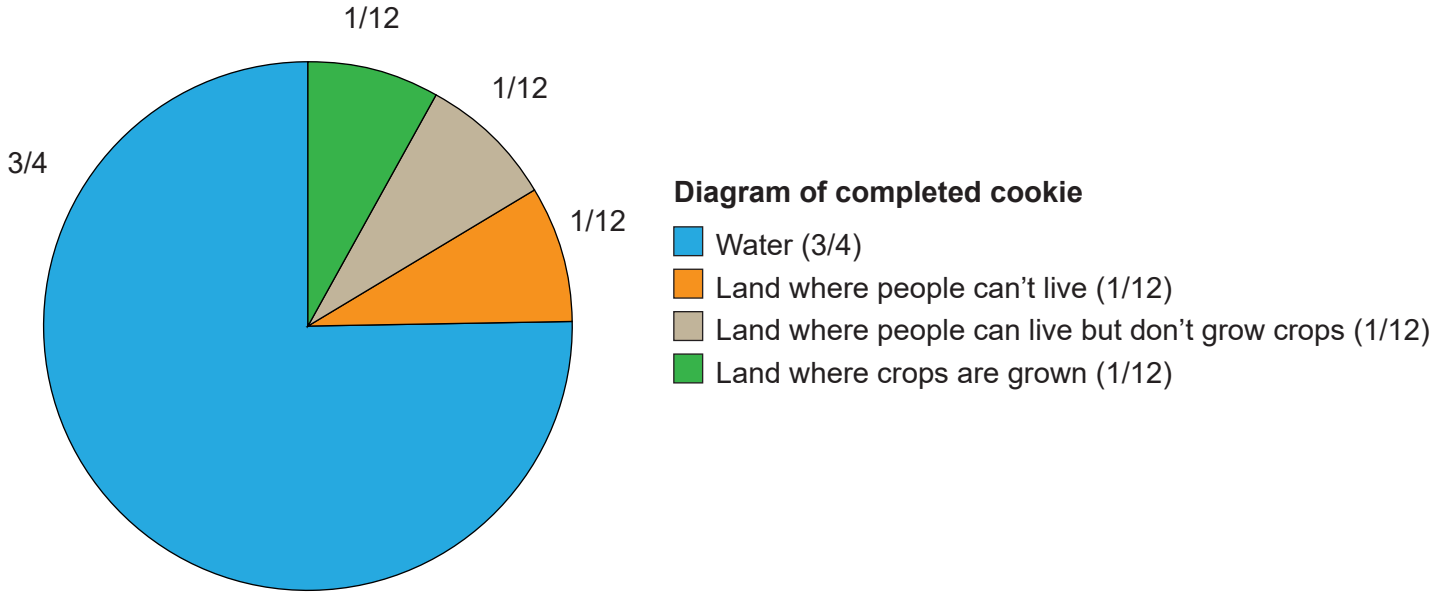
5. Explain that you will use a cookie to find how much land on Earth is being used as farmland to grow food for all the world's people.

6. If you are using the Student Pie Chart (provided), distribute one to each student, along with some markers.

7. Decorate the cookie according to the instructions, narrating as you go. To bring in more geography, use a globe or map of the world to point out regions that are discussed during the demonstration. If using the Pie Chart, be sure to leave time for students to color and label their graph. You and your students should wash your hands prior to getting started!

Cookie Fractions	Narrative	Pie Chart
Whole Cookie	Whole Cookie Have the class gather around the cookie and say: "Today we are going to decorate a special cookie. Let's pretend that this big, round cookie represents the surface of the whole Earth. We will decorate our cookie to find how much land we use to grow food for all the world's people."	
3/4	Ask students, "What does the blue part of the cookie represent?" (*Water*) Ask three students to come up and add colored candies or fruits to the water to represent the living things that are in the oceans, lakes, and rivers.	Students color 3/4 of their pie chart blue to represent Earth's water and label it: Water
1/4	Ask students, "What covers the rest of the Earth's surface?" (*Land*) "Is more of the Earth covered in land, or covered in water?" (*Water*)	
1/12	Use the decorating gel to divide the "land" section into thirds lengthwise, each 1/12 of the whole cookie. Point to one of the pieces and say, "This piece represents areas of the Earth where people can't live – such as very icy regions (like the Arctic poles), deserts, and high, rocky mountains." Ask a few students to decorate this piece. They might add marshmallows (icy regions), chocolate sprinkles (deserts), or Hershey kisses (mountains). Ask the students, "Why do you think people can't live in the desert? On a rocky mountain peak? In frozen regions, like Antarctica? If people can't live in these places, do you think we can grow food there?"	Students color 1/12 of the pie chart to show mountains, deserts, ice, etc. and label it: Land where people can't live and plants can't grow

Cookie Fractions	Narrative	Pie Chart
2/12 or 1/6	Explain that on the remaining pieces, people can live and we can grow food. But we don't use all of this land for farming, so let's see what else is on this land.	
1/12	Point to one of the remaining 1/12 pieces and tell students, "This is land that we don't use to grow food. What kinds of things might be on this land?" (*Forests, wild grass/shrub lands, houses, roads, factories, schools, etc.*) You may want to share that most of this land is wild areas that are home to many plants and animals. A small part of it is built on by humans. Ask a few students to decorate this piece with animal crackers to represent wild lands and a few small candies to represent developed areas.	Students color 1/12 of the pie chart to show wild areas and areas with houses, roads, factories, etc. and label it: Land not used to grow food
1/12	Point out the final 1/12 piece. Tell students, "This is the land on Earth that is being used to grow the food that feeds us – the farmland." Stir a few drops of green food coloring into the frosting. Ask the students, "Do you think the piece of the cookie showing farmland is big or small? Why?"	Students color the remaining 1/12 of the pie chart green to show the Earth's farmland and label it: Farmland



DISCUSSION QUESTIONS

1. What are some foods you eat every day that come from farmland?

Answers may include: apples and other fruits that grow on trees, carrots and other vegetables, spinach and other green leafy plants, grains (like rice, wheat for bread, and corn for cereal). If students don't mention it, you can ask them if they think the meat and dairy they eat needs farmland. Explain that animals like cows, pigs and sheep need room to graze (eat grass) and also eat "feed" which is usually made out of grains like corn, oats, and barley that grow in the ground.

2. Does all of our food come from the land? Where else does food come from?

Not all of our food comes from the land. Food (like fish and shellfish) also comes from water – oceans, rivers, and lakes.

3. Can you think of examples of farmland in your community? Or examples of farmland you've seen somewhere else? What do these spaces look like?

Answers will vary.

4. Why can't we grow food on all the land on Earth?

Plants need certain conditions in order to grow. They need soil that is healthy and is not too rocky, too dry, too wet, etc. Because of this, few plants grow on mountain peaks, in polar regions covered in ice, and in deserts that get very little rain. We also don't grow large amounts of food on land that's been developed for things like houses, factories, roads, and schools.

5. Can you think of reasons why we might need to use more land for farming?

If the farmland that we're currently using to grow food becomes unhealthy from pollution or soil erosion, we will need to change some of our wild areas into farmland. We may also need more farmland as the human population grows and there are more people to feed. Some students may mention meat consumption – raising animals, like cows, sheep, and pigs, for meat and dairy uses a lot of farmland. If more people eat these types of meat, we will need more farmland for grazing and to grow animal feed.

6. Can't we just use the wild areas as farmland if we need more space to grow food?

While we could do this, it is not a good solution for people or the planet. Expanding farmland into wild areas would disrupt the plants and animals that are living there. There would be less homes for insects and animals and less trees to filter the air. The best solution is to take care of the farmland that we are currently using so that it can continue to provide us with all the food we need!

7. How can we protect the farmland that we're using so that we don't need to expand into wild areas?

People can keep the ground and water clear of pollution, not litter, plant trees to prevent soil erosion, buy food from local farmers (local farmers are more likely to let the soil rest between plantings so that it stays healthy), teach other kids and grown-ups about the importance of protecting our soil, etc.

8. Are there ways we could decrease the amount of farmland that we use?

Answers will vary. Students might mention growing food in developed areas like backyard or rooftop gardens, fewer people eating meat, developing more efficient farming methods, etc.

MEASURING LEARNING

Students create a poster that illustrates what they have learned about the Earth's farmland and display it for other students in the school.

FOLLOW-UP ACTIVITIES

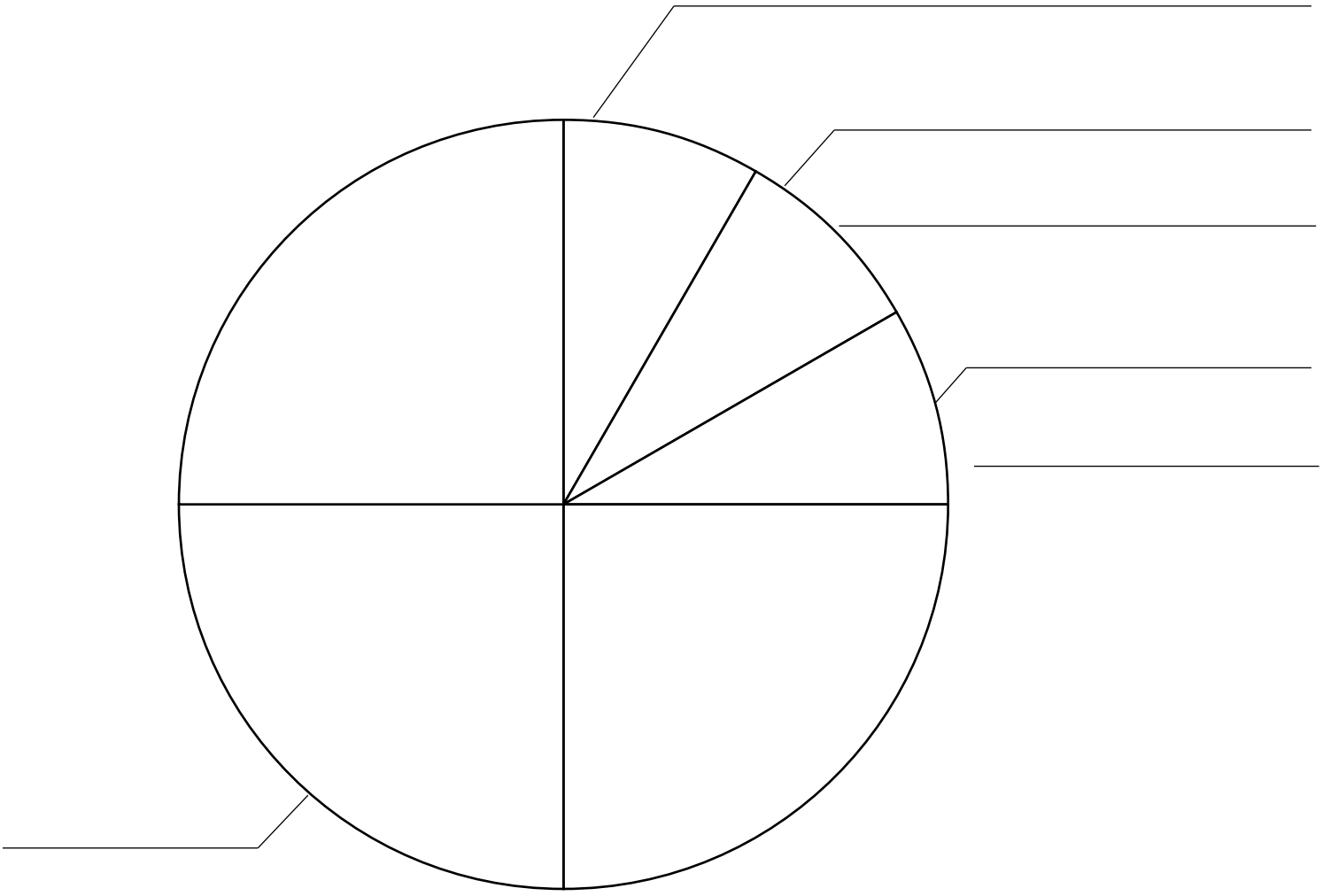
1. Introduce students to one way we can reduce pollution and create more soil – composting. *Scraps into Soil* is a lab activity where students learn about composting and test how well various types of waste break down.

2. Arrange a class field trip to a local farm or dairy. The students can learn what foods come from the farm they are visiting. They can ask the farmer how the farm has changed over the years and to tell them more about taking care of farmland.

This activity was adapted from "Enviro-Cookie," published by the North Carolina Zoo, Education Division and "Earth: The Apple of Our Eye," published by Population Connection.

EARTH COOKIE
STUDENT PIE CHART

Name: _____ Date: _____



Use the following phrases to help you label your pie chart:

1. Water
2. Land where people can't live and plants can't grow
3. Land not used to grow food
4. Farmland

UNIT 6 | PEOPLE AND RESOURCE USE

GO FISH!

COUNTING ON PEOPLE
K-5 Activities for Global Citizenship

METHOD

Students share a bowl of goldfish crackers to simulate the challenges that arise when trying to divide something equitably.

MATERIALS

- Goldfish crackers (20 per student)
- Napkins
- Plastic snack size baggies (1 per student)
- Serving bowl

INTRODUCTION

There are many things in life that must be shared - materials and space in a classroom, roads, parks, and buses in our community, and air and water in the world. But not everyone, whether in our community or in the world, always gets an equal share. Learning to share things and consider the needs of others can be difficult and requires compromise and problem solving. In this activity, students share a bowl of goldfish crackers, investigate methods for dividing them equitably, and explore difficulties that arise.

PROCEDURE

Be sure you and the students wash your hands before the start of this activity.

1. For each student in the class: fill a plastic baggie with 10 goldfish and add 10 goldfish to the serving bowl. (If you have 20 students, you'll have 20 baggies with 10 goldfish in each, and 200 goldfish in the bowl.)

2. Seat the students in a circle and give each a napkin. Tell the students "We will be sharing a large bowl of goldfish crackers and when the bowl comes to you, you may take as many crackers as you'd like. We will be using these crackers in just a bit, so be careful not to eat them." Hand the bowl to the first student and let the students pass it around, or facilitate passing it as necessary. Remind the students that they are not to eat these goldfish.

CONCEPT

People share many things in a classroom, a community, and the world. Sometimes they are shared equitably and other times inequitably.

GRADE LEVEL

Lower elementary

SUBJECTS

Social Studies, Science, Math

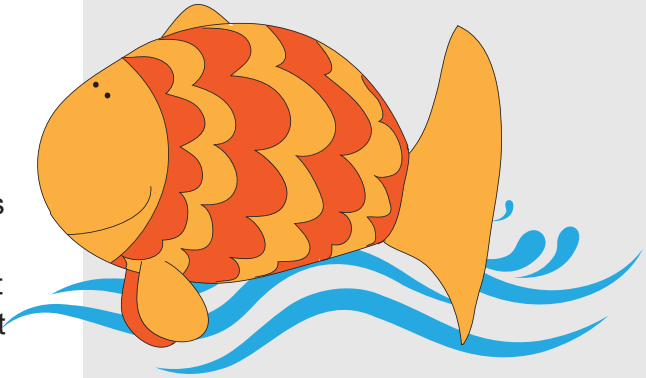
OBJECTIVES

Students will be able to:

- Compare amounts and describe which is more and less.
- Work cooperatively to solve a problem.
- List three items that may be shared.
- Identify three ways to promote sharing.

SKILLS

Sharing, describing, number-sense and counting, critical thinking, understanding cause and effect, observing, cooperating



3. Have the students reflect on what happened. Did the bowl of crackers make it all the way around the circle or did the first few students take large handfuls so little or nothing was left for the rest of the class?

4. Ask the students to count how many crackers they have. On the board, list each student's name and how many crackers they have in round one. Ask the students: Are you happy with the number of crackers you have? Do you think what we did is fair? Why or why not?

5. Pass the bowl around again and ask the students to return the crackers to the bowl.

6. Tell the students that you want to distribute the crackers again but in a way that is fairer to everyone. Ask them to brainstorm how they could make sure everyone gets the same amount of crackers and then let them try out some of their ideas. Some may work, others may not. If they try a strategy that does not work, encourage them to return the crackers to the bowl and try again.

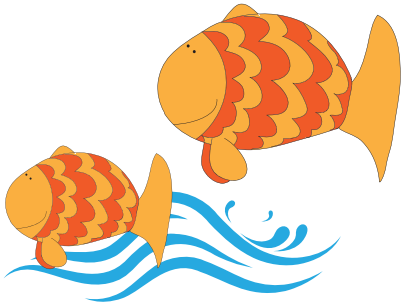
   Possible ways the students may try to equitably distribute the goldfish crackers:
   a. Each student takes a specific number and passes the bowl. If crackers are left, they might do it again with either the same, or a different, number.
   b. Each student takes one handful and passes the bowl.
   c. Each student takes one scoop (of something like a plastic cup) and passes the bowl.
   d. Each student takes one cracker and passes the bowl until it is empty.

7. Distribute the plastic baggies of crackers. Ask the students to count how many crackers they have (each student should have 10) and record these numbers on the board for each student. Point out that the number of crackers in all the baggies is exactly the same as the number that was in the bowl.

8. Referring to the numbers recorded on the board, compare the number of crackers each student had in the first round to the number each student has in their baggie. How does this amount of crackers compare to the first round when the students took as many as they wanted? Which students had more crackers in the first round and fewer crackers in the second? Which students had more crackers in the second round and fewer crackers in the first? Did anyone have the same number of crackers in both rounds?

9. Ask for reactions. Are you happy with the number of crackers you have? Do you think this way of giving out crackers is fair? Why or why not?

10. Let the students eat the crackers in their baggies.



DISCUSSION QUESTIONS

1. What challenges did you face when working together to share the crackers fairly?

2. In this activity we discovered that in order to share fairly, we might have to take a specific amount so that everyone else gets some too. We shared the crackers. What are some other things that you like to share? What are some things that you don't like to share?

3. Are there items in the classroom that everyone needs to share? *(Answers will vary)* What are some things we could do in class to make sure everyone gets a fair share? *(Answers will vary but may include: share often, rotate use of certain materials, use a sign-in system for borrowing resources)*

4. What are some things you share at home? In your community? Are there things shared by everyone in the world?

   Home: room, food, toys, time with parents or other caretakers; Community: streets, parks, libraries, a local river, hospital, fire department; World: air, forests, soil, fish, animals, water, oceans.

5. Do you think these resources are shared fairly? Why or why not?

   Answers will vary.

6. What would happen if there were twice as many students in your class and you did this activity again with the same number of crackers?

   The amount each student received would be smaller. Each student would have less in his/her baggie.

7. What if there were only half as many students in your class when you did this activity again?

   The amount for each students would be twice as big. Each student would have more in his/her baggie.

MEASURING LEARNING

Help students keep a list for the rest of the week of things that may be shared in the classroom or at home. Gauge their ability to answer questions such as: What items did you share this week? Which item was the easiest to share? Which was the hardest? Were these items shared fairly or unfairly? How did it feel to share? How do you think it made other people feel when you shared with them?

UNIT 7 | PEOPLE AND WASTE

WHO POLLUTED THE RIVER?

COUNTING ON PEOPLE
K-5 Activities for Global Citizenship

METHOD

Through an interactive story, students experience the pollution of a river over time and propose methods to protect the river from current and future pollution.

MATERIALS

- Clear gallon jar or bowl of water
- Small lidded containers
- Container Labels (provided)
- Character Nametags (provided)
- Story: “Who Polluted the River?” (provided)
- Container ingredients
- Slotted spoon
- Plastic fish toy (optional)

CONCEPT

Over time, the actions of people have caused some rivers to become polluted. We must work together to protect and clean our rivers.

GRADE LEVEL

Lower elementary

SUBJECTS

Science, Social Studies, Language Arts

OBJECTIVES

Students will be able to:

- Name two pollutants that can harm the health of a river.
- Identify how the health and use of rivers has changed over time.
- Propose methods for preventing and cleaning up water pollution.

SKILLS

Critical thinking, listening and observing, role playing, understanding cause and effect, describing

INTRODUCTION

Rivers have always been an important resource. They provide water for drinking, a means of transportation, a home for wildlife, and more. As human populations have increased, so has our impact on the water system and many rivers have become polluted as a result. Some pollutants enter rivers through the actions of individual people, like leaving trash on the ground. However, other pollutants come from larger problems like factory run-off or driving cars. It is important that we know where river pollution comes from so that we can work together toward cleaner rivers today and in the future.

PROCEDURE

1. Before class, tape the Volunteers label to the handle of the slotted spoon. Then prepare and label the small containers using the items in the chart on the next page. Prepare enough characters for each student to have at least one. There are 10 different container labels, so you will most likely need to double some characters and students will have identical containers.

NOTE: Don't have more than one barnyard container (coffee), as two doses of it will make the water too dark to notice the progression of pollution afterwards.

CHARACTER (CONTAINER LABEL)	CONTAINER INGREDIENTS
Natural materials	Dry leaves
Building sites	Soil
Farmers	Baking soda
Family picnics	Litter, assorted (shreds of paper, pieces of plastic, etc.)
Person fishing	Tangle of fishing line or dental floss
Barnyards	Water + instant coffee
Factories	Water + 1 drop red food coloring
Drivers	Vegetable oil + 1 drop red and green food coloring
Washing the car	Water + 1 drop of dishwashing soap
Motorboats	Vegetable oil + 1 drop red and green food coloring

2. Cut out the Character Nametags. Make sure there is a Character Nametag for each container you've made (i.e. if there are two "Driver" containers, there should be two "Driver" nametags). One Nametag will be the "Volunteers." They will not have a matching container and instead, will use the labeled slotted spoon.

3. Fill a clear jar or bowl with water. Place the bowl in a location that can be seen by all students. Set up the labeled containers and slotted spoon within easy reach of where you'll be facilitating the activity, lined up in the order that they appear in the story.

4. Distribute one Character Nametag to each student. To activate background knowledge, ask students to share one thing they already know about the character they are given (the sound it makes, what color it is, etc.).

5. Explain that you will tell a story about a river, and that each of the students will play a part in the story. The jar or bowl of water represents the river.

NOTE: This lesson can be easily localized by replacing the italicized words with the river and Native American groups that are local to your area. This map of Native lands may help: https://native-land.ca/.

6. When students hear the name of the item pictured on the Character Nametag you've given them, they should come up to you to find their matching container, open it, and empty its contents into the bowl of water. If you feel the students will have trouble opening the containers without spilling the contents, remove the lids for them, or leave the lids off altogether.

7. If using a fish toy, put it in the water now and explain that the fish lives in the river.

8. Read the story "Who Polluted the River?" aloud to the class. Add emphasis as you read each bolded character name and pause after each question to give the students time to think and respond. If using a fish toy, occasionally include the question "How do you think the fish feels?"

9. Go over the Discussion Questions as a class.

DISCUSSION QUESTIONS

1. Who polluted the river?

Everyone played a role.

2. How did people impact the river over time?

The impact that people had on the river grew over time. Negative impacts include trash and toxic materials going into the water from boats, factories, and farms. People had a positive impact on the river when they volunteered to collect trash along the riverbank.

3. Think about the pollution in your container. To keep the river clean, what could each of us do to keep the pollution from ever getting into the river?

Answers may include: biking or walking instead of driving, using water carefully, picking up litter so it doesn't end up in our fresh water supply, talking to friends, family and neighbors about the importance of keeping our rivers clean.

4. Challenge students to come up with ways to clean the water in the bowl. Can water in a river be cleaned up in the real world?

Solids can be strained using a kitchen strainer or netting. Students may also find coffee filters or absorbent cotton helpful. In reality, people clean up rivers in many ways – using nets to pull out large items, treating the water with chemicals, or introducing organisms that filter or digest pollutants from the water.

5. Is it easier to prevent pollution, or to clean it up later? Have students explain their ideas.

Preventing pollution is more effective for keeping waterways clean.

MEASURING LEARNING

Ask students to pick a pollutant from the story and illustrate:

1. an action that would cause that pollutant to go into the river.
2. an action that would prevent that pollutant from entering the river.

FOLLOW-UP ACTIVITIES

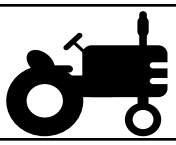
1. Arrange a class field trip to your local waste water treatment plant. Prior to your visit, have each student write down one question they have about polluted water and/or the cleaning process. At the plant, ask that an employee provide a tour of the facility and provide information such as how the water is cleaned, how much water goes through the plant, and why the plant is an important part of the local community. Be sure to leave time for student questions!

2. Ask someone from a local Indigenous group to speak with your students about their experience with the river. In their community, how was the river used in the past and how is it used currently? What are current watershed issues in their community?

WHO POLLUTED THE RIVER?
CONTAINER LABELS

Natural materials

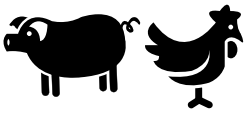
Building sites



Farmers

Person fishing

Family picnics



Barnyards

Factories

Drivers

Washing the Car

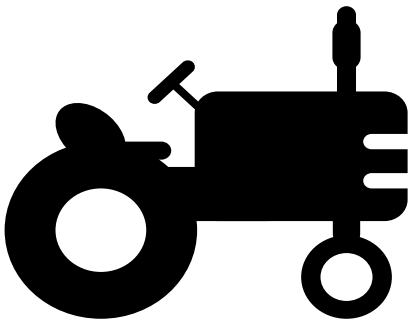
Motorboats

Volunteers

WHO POLLUTED THE RIVER?
CHARACTER NAMETAGS

Natural materials

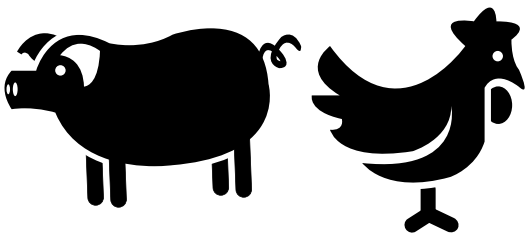
Building sites



Farmers

Person fishing

Family picnics



Barnyards

WHO POLLUTED THE RIVER?
CHARACTER NAMETAGS

Factories

Drivers

Washing the car

Motorboats

Volunteers

STORY: WHO POLLUTED THE RIVER?

Feel free to localize this lesson by replacing the italicized words (river and Native American) to reflect your local river and history.

For more than 10,000 years, people lived on the banks of this *river*. This was a time before roads and cars, and the land was very wild. Imagine that the bowl of water in front of you was collected by a *Native American* a long, long time ago.

- Describe how the water looks to you. Would you drink this water? Eat fish that came from it? Swim in it?
- How do you think *Native Americans* used the river? (*Answers may include: bathing, drinking and cooking water, transportation, food source, etc.*)

Native American groups built villages along the banks of the *river*. They raised families, hunted in the forests, grew crops, and caught fish in the *river*. But they didn't change the natural surroundings too much. We can guess that all of these actions led to **NATURAL MATERIALS**, like twigs, leaves, and pebbles being washed into the *river*. Eventually, people from Europe traveled to this land from across the ocean. These settlers found rich soil for farming, forests full of wildlife, and a *river* that provided plenty of food and water. It was a perfect place to live.

- How do you think the new settlers used the river? *(Answers may include: for water to drink, cook with, bathe and wash clothes in; to catch fish from; to go boating on; to move supplies from place to place)*

More and more people moved to the area. Gradually, a city grew up around the *river*. People drained swamps and cut down forests to build houses, schools, churches, stores, roads, hospitals and many other buildings. Rains washed loose soil from these **BUILDING SITES** into the *river*.

- Is this water safe to drink? *(If the response is "no," ask if the river had leaves or soil in it when people long ago drank from it.)*
- Would you swim in it? Is it safe for animals to drink and fish to swim in?

At first, the city was small. Upstream, **FARMERS** planted crops to feed all the people as the city grew. They used chemicals called fertilizers to make their crops grow faster. Some farmers kept pigs and other animals in **BARNYARDS**. As rainwater drained out of the fields and barnyard, it carried some of the fertilizers and manure into a little creek behind the farm. The creek flows into the *river*.

- Would you drink this water now? Would you swim in it? Go boating on it?
- Is the water safe for fish and animals?

Now, the city along the *river* has grown to be one of the largest cities in the country. Many people live and work in and around the city. Many businesses provide services for the people. Several **FACTORIES** make things that people want, like cars and furniture, but the factories leak paint and other chemicals into the *river*. These pollutants cause the fish to become sick. As people move about their busy days, they often drive from place to

place. Traffic jams are a big problem for **DRIVERS** who take their cars to and from work. If a car is not taken good care of, it might also leak oil or other fluids, which will be washed off the roads and into the *river* with the next rain.

- Would you drink this water now? Would you swim in it? Go boating on it?
- How could we tell if this water is safe for wildlife? (*Answers may include: looking at the health of the plants and animals in and around the river, smelling the water, or testing the water.*)

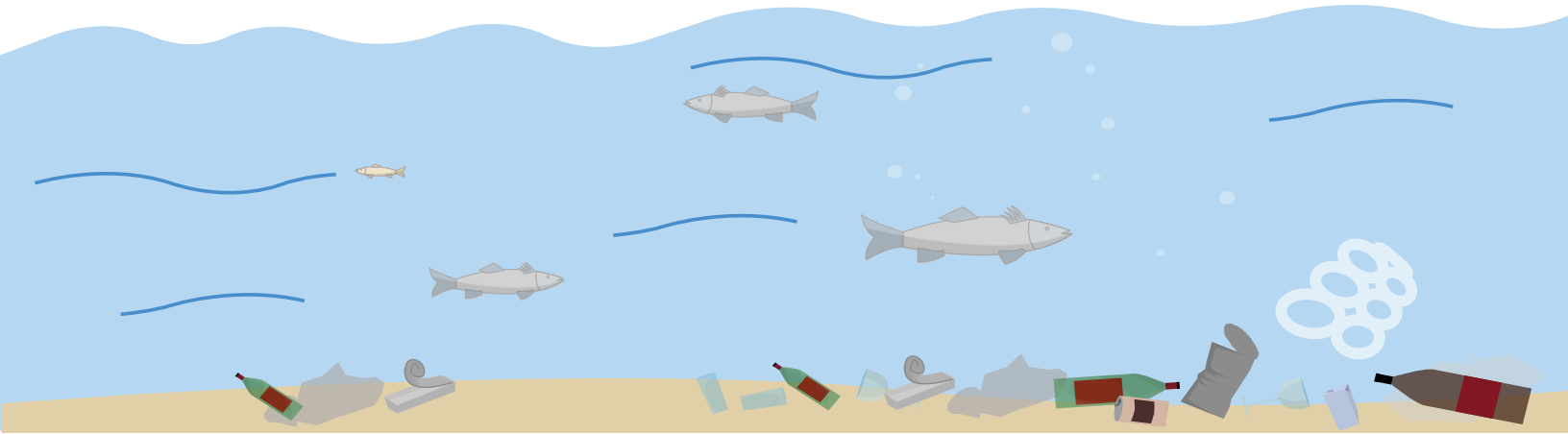
In one neighborhood, a person is outside **WASHING THE CAR**. The soapy water rushes down the driveway into the storm drain by the curb; the storm drain empties into the *river*. The grease and grime on a car contains tar from the roads, very tiny bits of rubber from the tires, and rust. If the person had gone to a local car wash, the water would have been cleaned before it went back into the *river* or was recycled.

On nice days, many people head down to the *river*. Some zoom up and down the *river* in **MOTORBOATS** and don't notice that a little engine oil leaks into the water. The oil will not mix with the river water, but will float on the surface. It will coat the feathers of ducks or other birds that paddle around on the water looking for food, making it harder for them to stay afloat or fly. Lots of people are having **FAMILY PICNICS** in the parks along the *river*, too. Some of these people have left trash on the shore. With the next storm, that trash will wash into the *river*. On the shore a **PERSON FISHING** snags a hook on a log. Instead of untangling it, the person breaks off the snagged piece of the nylon fishing line and lets it fall into the *river*.

One weekend, a group of **VOLUNTEERS** visits the *river*. They walk up and down the riverbank and collect trash. [Student uses the slotted spoon to scoop out some garbage.] They gather over 100 bags of garbage that will go to a recycling center or proper landfill and will no longer pollute the *river*.

The *Native Americans* living today see a very different *river* than their ancestors saw 500 years ago. People have changed the river in many ways.

- How do we use the *river* today? (*Answers may include: boating, fishing, swimming, etc.*)
- In what ways do we use the *river* the same as the *Native Americans* and settlers? What ways do we use the *river* differently? (*Answers will vary. Students may recognize similarities like transportation and food, but may not realize that the water they use every day also may come from a local waterway.*)



WEB OF LIFE

METHOD

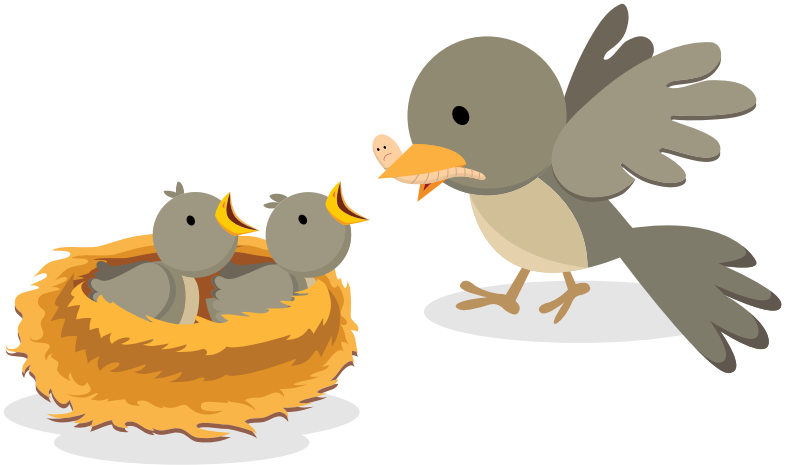
Students participate as a character in an interactive story that explores how everything in nature is interconnected.

MATERIALS

- Ball of yarn
- Character Name Tags (provided)
- Student Worksheet
- Yarn or tape for student name tags

INTRODUCTION

The world is composed of both natural and human-built environments. Both types of environments, or communities, are made up of a web of relationships between people, other living things, and natural features like rocks, water, and air. Just like in a human community, members of natural communities rely on each other and the health of the environment in order to meet their needs. If a food source disappears or things get out of balance, the entire ecosystem can be impacted. It's important for students to understand the interconnections within natural communities and the impacts that humans can have, both positive and negative, on this delicate web.



COUNTING ON PEOPLE

K-5 Activities for Global Citizenship

CONCEPT

In an ecosystem, everything is connected to everything else and the well-being of one can affect the well-being of all.

GRADE LEVEL

Lower and upper elementary

SUBJECTS

Science, English Language Arts, Social Studies

OBJECTIVES

Students will be able to:

- Name two relationships between living things in a forest.
- Explain the interconnectedness of all members of an ecosystem.
- Identify two actions people can take to help keep forests and forest creatures healthy.

SKILLS

Listening, cooperating, answering questions about text read aloud, conducting research, creative writing

PROCEDURE

1. Before class, print the Character Name Tags and attach yarn to turn them into necklaces. Alternatively, you can tape the Character Name Tags to students' shirts. Each student will need a Name Tag.

   Members of the Forest Community:

Sun	Ant	Flower
Tree	Bird	Rabbit
Air	Worm	Fox
Water	Soil	People
Plant	Bee	

   NOTE: Any character but the "sun" may be doubled up if the class size exceeds 14 students. When more than one student plays a given role, the two students should sit together in the circle.

   NOTE: You may want to replace some of the generic characters with plants/animals that are common in your area in order to make connections to your specific location/environment. For example, if you're in Wisconsin, rather than "bird," use "robin," the state bird. Or instead of "tree," use a tree that is visible from your classroom window.

2. Instruct the students sit in a circle on the floor. Pass out one Character Name Tag to each student, making sure to mix up the order of the characters to help form the crisscrossing web. Each student assumes the role of the character pictured on their Name Tag.

3. Go around the circle and ask each student to say their character out loud. This will help the students quickly identify where they need to roll the ball of yarn when it is their turn to roll. To activate background knowledge, ask students to share one thing they already know about their character (the sound it makes, what color it is, etc.).

4. Read the Forest Community Story. Students will pass a ball of yarn between them as their characters as called. Students should roll, not throw, the ball of yarn to their classmates. The crisscrossing yarn inside the circle will gradually form a web.

5. The "sun" will be the first student with the yarn ball. When "tree" is read, the "sun" should roll the ball to the "tree" while holding onto the end of the yarn. Continue to have the students hold a piece of the yarn and then roll then ball with the mention of each new character. It's best if they keep their hands close to the floor so the yarn will lie flat inside the circle and the teacher can walk over the yarn. The yarn is only passed to each student once, when their character's name is first mentioned.

6. When the story is over and the web is complete, ask students to stand, lifting their part of the yarn so the whole group can see the web at work.

FOR UPPER ELEMENTARY STUDENTS:

7. Now that the students have experienced the forest community's web, challenge them to look at the webs of other ecosystems. Divide the class into small groups and assign each a different ecosystem. These could include: prairie/grassland, fresh water lake, desert, arctic tundra, beach/coastal, mountain, or wetlands.

8. Each group should conduct research to discover what community members make up their assigned ecosystem. Have the students write a story about the interconnectedness of their ecosystem, using the community members as characters and their assigned ecosystem as a setting. Allow the groups enough class time to research and write the story, or, you may want to assign parts of the project as homework.

9. Select several of the student-written stories to read aloud in class and have the students create a yarn web.

10. As a class, discuss potential threats to the ecosystems in the stories, and then discuss ways to protect each of the ecosystems and the community members within them.

FOREST COMMUNITY STORY

Instructions to the students: "Imagine that you're no longer in the classroom but outside in the sunshine, surrounded by the smells and sounds of a forest. Imagine that you are becoming the part of the forest pictured on your nametag.

I'm going to read a story about this forest, which shows how important each member of the forest is to all the other members. As I read about your part of the forest, a classmate will pass a ball of yarn to you. Take hold of the yarn, and when I read the next character's name, roll the ball to that new person.

Don't let go of your part of the yarn, but hold it down on the floor so I can walk around inside the circle and help pass the yarn to the next person."

Interactive story: "Our forest community grows healthy and strong with the light of the **SUN**. [Hand the ball to the student who is the sun.] All of the creatures in the forest depend on the sun's energy. It keeps them warm and helps them grow.

A huge **TREE** stretches from the ground to the sky and looks to the sun to give it strength. Stretch your arms up to the sky like they are branches of a tree reaching up for the sun's light. Take a deep breath. Just like us, the tree needs **AIR** to breathe. [With older students, explain the complementary relationship between people and trees. People inhale oxygen and exhale carbon dioxide while trees, and other plants, take in carbon dioxide and produce oxygen.]

A breeze blows throughout the forest. It carries air and **WATER** to all of the living things. The water falls to the ground as rain and gets everything wet. We all need the sun, air, and water to live.

A thirsty **PLANT** in the forest drinks up the water from the ground and grows big and strong. New leaves open up on the plant. Old leaves break off and fall to the ground. A teeny-tiny **ANT** makes its way through the fallen leaves on the forest floor. It cuts up pieces of the plant to carry home and eat. It follows a long line of ants up the nearest tree and into its home, a hole in a high branch.

The forest is bursting with life! The ants pass a hungry **BIRD** sitting on its nest in the branches. The bird looks down to the ground for food. It spots a **WORM** wiggling around on the forest floor that will make a perfect lunch. The bird swoops down, and at the last second, misses the mighty worm. The bird will have to find lunch elsewhere.

The worm quickly wiggles down a hole in the **SOIL**. Thanks to this hardworking worm, the soil of the forest is a clean, healthy place for things to grow and insects to live. [For older students, explain how the worm, ants, and other insects are part of the process of decomposition. They might be small, but they are still very important parts of the forest community.]

The worm made the soil loose enough that a **BEE** and its family build a cozy home underground. Each day, the bee leaves its nest to find food. It stops at a **FLOWER** to gather up pollen for dinner. Because the bee stopped by, the flower can now make seeds that will become next year's flowers. [With older students, elaborate on the process of pollination and explain that the flowers depend on the bee for this process.]

The flower is food for the **RABBIT** who hops by, ready to take a bite of its leaves. A **FOX** watches the fuzzy rabbit from behind a log, keeping an eye on its food for the day. [For older students, explain that plants are producers because they create their own food by using energy from the sun. Rabbits and foxes are consumers because they cannot create their own food and must eat other organisms for energy.]

But suddenly, the fox hears a loud sound and runs off to hide. Two **PEOPLE** are hiking through the forest. They are listening to the bluebird sing its favorite song and are picking plants and flowers as they walk. They're happy to be in the woods where the air is cool and the animals play. While walking, they notice that someone has left trash on the ground. They pick it up so they can throw it away later. The sights and sounds of the forest inspire them to take care of this special place. They continue their stroll, determined to leave the forest better than they found it."

[Each child in the circle is now holding part of the yarn, ending with the two people who have entered into the forest community. Ask the class to stand up, being careful not to let go of their part of the yarn. They should continue to stand in the circle through Discussion Question 7.]

DISCUSSION QUESTIONS

1. As we worked through the story, the yarn web grew and connected all of the community members in the forest. Is there anything about the web that surprised you?

   Answers will vary.

2. What effect did the people walking through the forest have on the forest community?

   They picked flowers and plants. They also cleaned up trash in the forest.

3. If the flowers are taken from the forest, which other creatures will be affected? [Instruct the student who represents the flower to gently pull on their string.] Who feels this pull?

   The rabbit and the bee.

   What is the relationship between the flower and the rabbit? If there are less flowers, where will the rabbit get its food?

   The rabbit eats the flower's leaves. If the rabbit cannot find enough food here then it might have to leave this forest to find food somewhere else.

   What other community member needs the rabbit? [The student who represents the rabbit gently pulls on their string.] Who feels this pull?

   The flower and the fox.

   What is the relationship between the rabbit and the fox? If there are less rabbits, where will the fox get its food?

   The rabbit is food for the fox. If there are less rabbits, the fox might need to leave the forest to hunt somewhere else.

   [Emphasize the concept that everything is connected to and needs everything else. The students can continue to pull their strings as the questions are being asked. At times, the teacher may need to cue the students regarding what parts of the forest are affected.]

4. What happens if the soil in the forest becomes polluted? Who will feel a pull? Is the soil anyone's home?

   The bee and the worm feel the pull. Both make their homes in soil.

   Other than the soil, who else is the worm connected to and what is their relationship? [The student who represents the bird gently pulls on their string.]

   The bird – birds eat worms.

   Do any other characters in the story need healthy soil?

   Plants, flowers, trees, the ant, the rabbit, and the fox. [These students can all pull on their strings.]

5. What would happen if it didn't rain in the forest for many weeks? What creatures would this affect?

   All of the animals, trees, and plants need water, just like we do. [The student who represents water pulls on their string. All the other parts of the forest can pull their strings as well.]

6. What would happen if we drove cars or a school bus near the forest to go on a field trip? Would this be good or bad for the air that the entire forest breathes?

   Car and bus exhaust can create air pollution. When the air is polluted, it isn't healthy and can make the plants and animals in the forest sick. [The student who represents air pulls on their string. Point out that the air affects all of the forest community and the people too. Everyone can pull their string.]

7. How does the web that we created show how everything in the forest is connected?

   The string of the web shows that each thing in the forest can affect another thing in the forest. For example, the piece of the string that connects the sun to the trees shows that the sun affects the trees.

   If one person pulls on their string, other people can feel it too, which shows that their characters are connected.

The students can return to their seats for discussion of the following questions.

8. If we took a class field trip to the forest, what should we do to make sure we take good care of the forest community?

   Answers may include: we should pick up our trash and any other trash we see on the ground; we should leave plants and flowers in the ground; we should not disturb any animal homes that we see – like a bird's nest or an ant hill.

9. Someone had left trash in the forest. If the people in our story hadn't picked it up, how might it impact the forest community? Which community members could have been hurt by the trash?

   Animals might try to eat it and get sick. Or the trash might get into a stream and pollute the water.

10. What can we do to help keep forests and forest creatures healthy?

    Answers may include: put garbage in trash cans; don't pick wildflowers and plants; plant trees; etc. Introduce the concept of stewardship – that people can be protectors of forest communities. The idea is not to discourage kids from visiting the forest, but rather to instill the importance of being respectful and understanding how our actions can affect other living things.

MEASURING LEARNING

For lower elementary, students complete the Student Worksheet. Some connections may differ from child to child and that's okay. Be more aware that each character is part of at least one connection and that the connection explanations are accurate.

For upper elementary, review the student-written stories to gauge students' understanding of how everything is an ecosystem is connected.

FOLLOW-UP ACTIVITIES

1. Students recreate the web in the form of a collage by mounting their Character Name Tags on poster-board and showing connections by either drawing lines and arrows or gluing yarn between the characters pictured.

2. Students create shoebox dioramas of ecosystems that include all the community members. They can present their 3-D representation of the ecosystem web and explain how each of the components is connected.

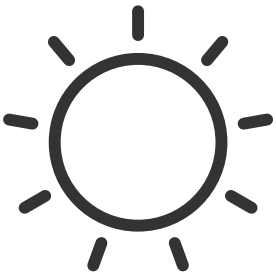
3. For older elementary students: Introduce the concept of invasive species. Define an invasive species as a foreign, nonnative species that causes significant harm to the new ecosystem in which it is introduced. Have students imagine what might happen in each of these following scenarios and discuss their impacts on the forest community:

   Scenario 1: A strange new vine starts growing in the forest, quickly covering up the flowers and smothering the plants on the forest floor.

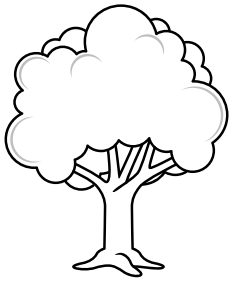
   Scenario 2: A new type of bug appears in the forest and starts eating all of the plants and building homes inside the trees, making them sick.

WEB OF LIFE
CHARACTER NAME TAGS, PAGE 1

Sun

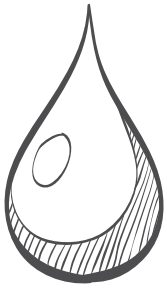


Tree



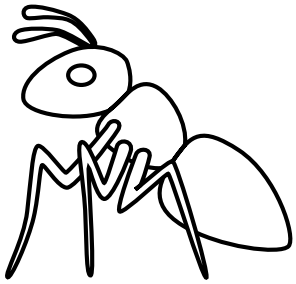
Air

Water



Plant

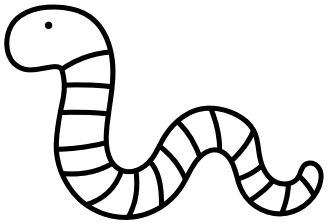
Ant



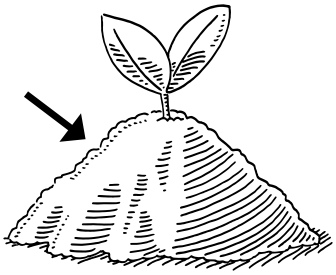
Bird

WEB OF LIFE
CHARACTER NAME TAGS, PAGE 2

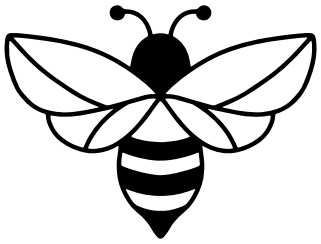
Worm



Soil

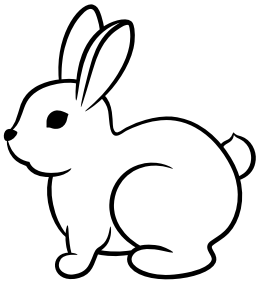


Bee

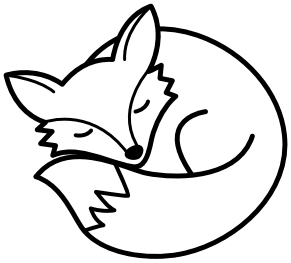


Flower

Rabbit



Fox



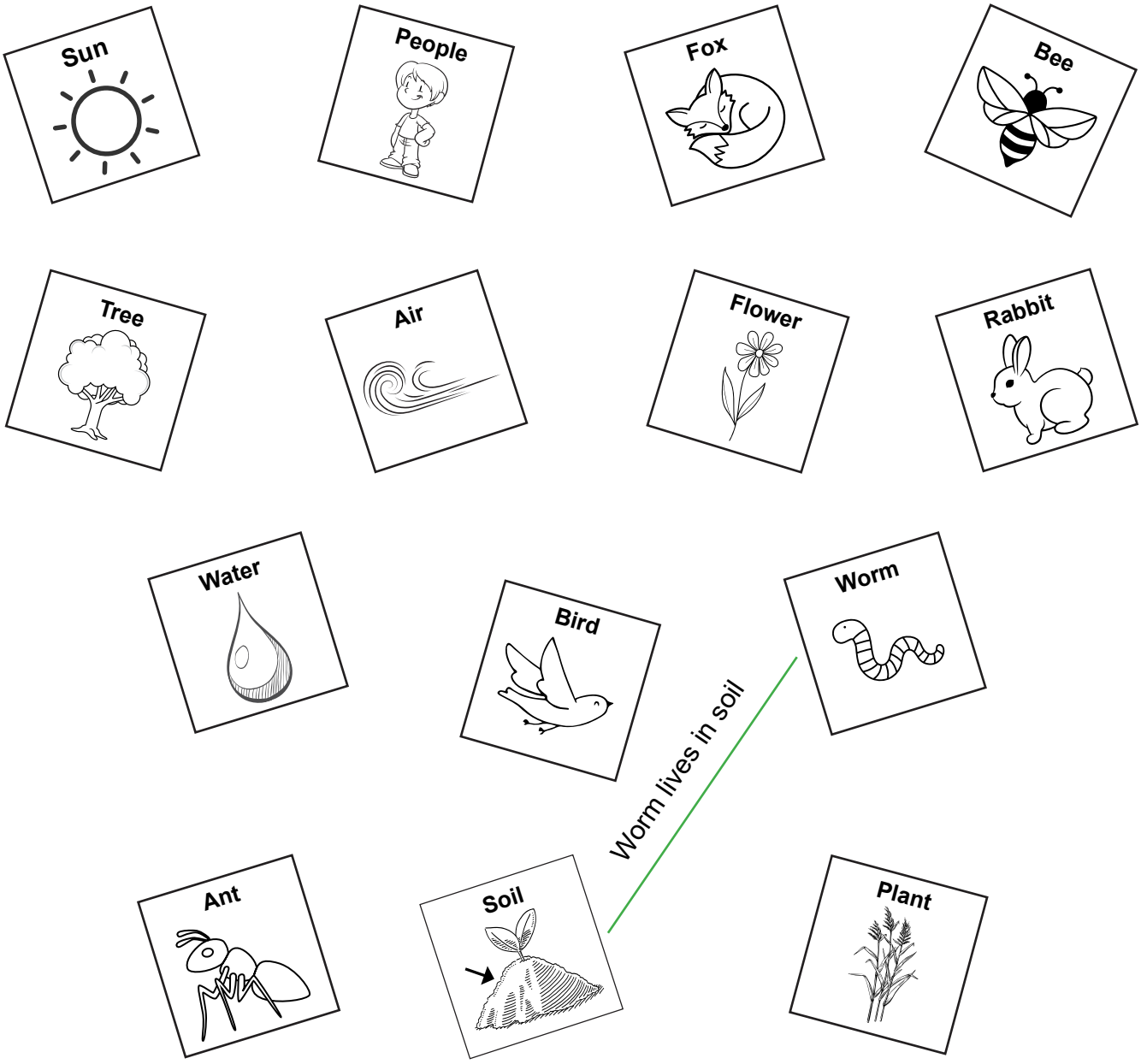
People

WEB OF LIFE
STUDENT WORKSHEET

Name:_____ Date:_____

Below are the animals, plants, and other things from the forest. Draw lines between any two that are connected. Draw as many connections as you can but make sure everything has at least one line connecting it to something else.

On each line, write why the two are connected. The first line has been drawn.



UNIT 3 | HOW MANY IS ENOUGH?

EARTH: THE APPLE OF OUR EYE

METHOD

An apple is sliced into pieces to model the amount of agricultural land being used on Earth while students track data on a pie chart.

MATERIALS

- Apple
- Knife
- Cutting board
- Pie Chart Tracking Sheet (provided)
- Markers
- Rulers
- Article: "Do we treat our soil like dirt?"

NOTE: If you would rather not use an apple and knife, use a ball of Play-Doh and dental floss.

INTRODUCTION

There are approximately 8 billion people living on the planet, and we all need food in order to survive. Whether fruit, beans, cheese, cereal or meat, the food we eat originates in the soil. As the global population grows, there will be more demand for food as well a greater need for healthy soil to grow that food. Already, half of all the **habitable land** on Earth is used for farming, and much of that **agricultural land**, about 75 percent, is used to raise livestock like cows, pigs, and sheep. Land used for livestock includes space for animal grazing and as well for growing crops like corn, oats, and barley that go into animal feed.

To feed our growing population in a sustainable way, we must keep the farmland we are currently using healthy and minimize the amount of land that will need to be converted from wild lands to farmland in the future. Protecting soil from erosion, reducing pollution of land, air and water, and reducing our consumption of meat and dairy can all help to preserve our current farmland while saving as much land as possible for other important uses, like wildlife habitat.

PROCEDURE

1. Before class, print copies of the National Geographic article "Do we treat our soil like dirt?" at the appropriate text level for your students (adjust using the grade level buttons at the top of the article).

COUNTING ON PEOPLE
K-5 Activities for Global Citizenship

CONCEPT

Half of the habitable land on Earth is used for food production, and it is important to preserve agricultural land in order to feed a growing population.

GRADE LEVEL

Upper elementary

SUBJECTS

Science, Social Studies, Math

OBJECTIVES

Students will be able to:

- Describe Earth's geography in terms of relative amounts of water, inhospitable land, habitable land, and land being used for farming.
- Apply knowledge of fractions to create a pie chart showing how the features of Earth's surface are divided.
- Identify two reasons why protecting agricultural land and maintaining healthy soil is important for food production.
- Describe at least two ways people can help preserve agricultural land.

SKILLS

Using fractions, creating a pie chart, observing, problem solving, reading and comprehending informational text, understanding cause and effect

2. Ask students to share what they ate for breakfast that morning and write responses on the board.

3. Pick a few of the students' responses, and as a class, discuss where each food came from (a tree, grains from a farm, an animal, etc.).

4. Introduce the term "agricultural land" to students and ask them to determine whether or not their breakfast foods came from the Earth's agricultural land.

Agricultural land: Land used for growing food and raising livestock for human consumption.

5. Explain that you will use an apple to find how much of the Earth's surface is agricultural land that is used to grow the food that feeds our human population.

6. Distribute the Pie Chart Tracking Sheet, markers, and a ruler to each student. Explain that students will keep track of the different features of the Earth's surface by making a pie chart on their Tracking Sheet.

7. Slice the apple according to the instructions, narrating as you go. (For a non-food option, use a baseball-size ball of Play-Doh. The Play-Doh will need to be somewhat firm so it keeps shape while you cut it with the dental floss.) Use a globe or a map of the world to point out the different geographic features that are discussed during the demonstration.

8. Pause throughout the demonstration to allow students time to color and label their Pie Chart Tracking Sheet based on the divisions in the apple-cutting demo.

Apple	**Earth**	**Narrative**	**Pie Chart**
Whole Apple	Planet Earth	Hold the apple out so that the class can see it. "This apple represents our planet."	
3/4	Earth's water	Cut the apple into quarters. Hold out 3/4 in one hand. Ask the students, "What do you think these pieces represent?" They may want to look at the globe for help. "These pieces represent all of the water in the world." Ask, "What fraction of the Earth's surface is covered in water?" *(3/4)* Set the three "water" sections aside.	Students color 3/4 of the pie chart blue to represent Earth's water and label it.
1/4	Earth's land	Hold out the remaining quarter. Ask the class, "What fraction remains?" *(1/4)* "This 1/4 represents all of the land on our planet."	

Apple	Earth	Narrative	Pie Chart
1/12	Inhospitable land	Slice the land (the remaining 1/4) in thirds, lengthwise. Hold out one of the pieces. Ask the class, "What fraction of the Earth's surface is this?" *(1/12)* "This 1/12 represents the areas where people can't live, and we also can't grow food." Ask students, "What types of land might fall into this category?" *(polar areas, deserts, swamps, very high or rocky mountains)*. "We call this land **inhospitable**." Set this "inhospitable land" slice aside.	Students divide the remaining 1/4 of their pie chart into thirds, lengthwise. Students decorate 1/12 of their pie chart to represent inhospitable areas and label it.
2/12 or 1/6	Habitable land	Hold up the remaining 2/12. Ask the class, "What fraction of the Earth's surface is this?" *(2/12 or 1/6)* "This is land that is "habitable" – land where people can live, and we could grow crops. But we don't use all of this land for agriculture.	
1/12	Habitable land that is not used for agriculture	Hold up one of the two "habitable" 1/12 pieces from the last step. "This land includes everything that isn't growing crops to feed us." Ask, "What types of things would be included on this land?" *(forests, wild shrub lands, developed areas like roads, schools, houses, etc.)* You may want to share that most of this land is forests and shrub lands that are home to rich and diverse wildlife. Some of it, but only a small fraction (1%), is developed by humans. Set this slice aside.	Students decorate and label another 1/12 of their pie chart to represent habitable land that is being used for things other than growing crops. They may color trees, buildings, roads, etc.
1/12	Agricultural land	Hold up the second of the two "habitable" 1/12 pieces and ask students, "What fraction of the Earth's surface is this?" *(1/12)* "This represents the Earth's agricultural land, all the land on Earth that is currently being used to grow food." You may want to remind them that this is half of all the habitable land on Earth.	

Apple	Earth	Narrative	Pie Chart
1/12 peel	Topsoil of agricultural land	Carefully remove the peel from the 1/12 slice of 'agricultural land' from the last step. Hold out the peel. "This peel represents **topsoil** – the soil right on the surface of the Earth in which plants grow."	
1/48 peel	Land used to grow crops directly for humans (doesn't include livestock)	Say, "But not all of the crops grown in this soil are being used in the same way." Cut the peel crosswise into 4 equal pieces and hold up one piece (1/48 of the whole apple's peel). "This is the amount of our farmland that is being used to grow crops like beans, fruits, vegetables and grains that get harvested for humans to eat. What fraction of our farmland is this?" *(1/4)*	Students divide the remaining 1/12 of the pie chart crosswise into 4 equal sections. Students label 1 of those 4 sections as cropland for humans.
3/48 peel		Ask, "What do you think the remaining agricultural land is used for?" "The remaining 3/4 of agricultural land is used for livestock like cows, pigs, and sheep. This land is used for grazing, where livestock eat grasses and other plants, and also to grow crops like corn, soybeans, oats, and barley that go into livestock feed."	Students label the remaining 3 sections (3/48 of the pie chart) as cropland for livestock.

If you want to reinforce the math concepts from the apple-cutting demo, have students work on one or more of the questions from the "Math Extension Bank" below. The extension questions can be worked on individually or in small groups.

Math Extension Bank

- Write a formula to express how the Earth's land is divided. *(Option 1: 1/3 inhospitable + 1/3 habitable but not used or crops + 1/3 agricultural; Option 2: 2/3 habitable +1/3 inhospitable; Option 3: 1/48 crops for people + 3/48 farming land for livestock +1/12 habitable but not used for farming + 1/12 inhospitable)*

- Write an equation using < or > to show how two different features of the Earth surface compare in size.

- Write a math story using at least five fractions or percentages to explain how the Earth's surface is divided. Teacher note: If necessary, provide a 'Fraction Bank' that includes the following fractions: 1/4, 3/4, 1/2, 1/12, 1/6, 1/48, 3/48

  Sample story 1: 1/4 of the Earth's surface is land. 1/3 of all the land on Earth is inhospitable and can't grow crops. Also people can't live there. Of the land where people can live, 1/2 is used for crops. The other 1/2 is forest and land that people are using for things like roads and houses. When you look closely at our cropland, you see that only 1/4 of it is used for food that humans eat straight from the farm. The other 3/4 of cropland goes to grazing and feeding livestock that eventually get eaten by humans.

  Sample story 2: 1/4 of the Earth's surface is land and 3/4 is water. 1/12 of Earth's surface is too harsh for people to live and for people to grow crops. Another 1/12 is covered in forests and things like roads, schools, and houses. The last 1/12 is land that is used to grow crops.

- We used an apple as a 3D model of the Earth. Can you think of a way to show the divisions we made using a different method?

9. Distribute a copy of the article"Do we treat our soil like dirt?" to each student. While they read the article, they should use their markers to highlight threats to the world's soil and underline things that can be done to protect the world's soil.

10. After reading, have students pair up to compare the threats and protections that they identified in the article.

DISCUSSION QUESTIONS

1. What are some foods you eat every day that are grown directly in the soil? What are some foods that come from livestock?

Answers may include: grains (like rice, wheat for bread, and corn for cereal), apples and other fruits that grow on trees, carrots and other vegetables, spinach and other green, leafy plants. All meat and dairy products come from livestock, including burgers, steak, ham, hotdogs, chicken, cheese, yogurt, milk, etc.

2. Are there examples of agricultural land in your community? Or examples of agricultural land you've seen somewhere else? What do these spaces look like?

Answers will vary.

3. Think about the article you just read. What are some human actions that are threatening the health of the world's soil?

Soil erosion, paving over farmland, loss of nutrients, and pollution.

4. Erosion, the removal of soil from the Earth's surface by wind and water, is the most serious threat to soil health. Although it is a natural process, erosion can be made worse by human actions. What human actions can cause soil erosion (look at the highlights in your article)?

Deforestation*: The roots and fallen leaves and branches of plants help to keep soil in place. When trees are cut down, the soil is no longer protected, and it easily washes away in the wind and rain. Planting trees can help prevent soil erosion.* '

Overgrazing*: When cattle eat grass, they pull it out of the ground by the roots, taking some soil with it. Each bite leaves a patch of ground uncovered, exposed to the wind and the rain. Also, these animals have sharp hooves that tear up the surface a little with each step.*

5. The article mentions that another threat to agricultural land is the loss of nutrients in the soil, which happens when the soil is not allowed to rest. What do you think it means to let soil "rest?"

It takes time for nutrients in the soil to replenish after growing a plant. To let soil rest, it can be left empty for a season so that the nutrients can be restored. Or, because different plants require different nutrients to grow, a different type of plant can be grown in the soil. This is known as ***crop rotation*** *– rotating the type of plants being grown in the soil so that nutrients can replenish. Most large industrial farms don't practice crop rotation because it is harder to maintain and more expensive. But many small, local farms rotate their crops and allow the soil to rest when needed.*

6. Why do you think so much more land is required for raising livestock than for other crops?

Answers will vary. Livestock not only need space and pastures to graze on, but also require feed. Animal feed is often made from corn, barley, wheat and other foods that require cropland to grow. It takes a lot of space to grow the grasses and grains that livestock will need to eat year after year in order to grow into big, healthy adults.

7. Can you think of reasons why we might need to increase the amount of land needed to grow crops?

We may need to increase the amount of land being used to grow crops if there is too much soil erosion, if the soil becomes polluted or losses its nutrients, or if more people eat meat and dairy so that there is more need for land dedicated to livestock grazing and feed. We may also need more farmland as the human population grows and there are more people to feed.

8. Earth's topsoil is generally 5-10 inches deep. It can take up to 1,000 years for about one inch of topsoil to form. Why is it important to preserve the topsoil on our agricultural land? Can't we just expand agricultural land into habitable land that's not currently being used for agriculture?

Because top soil takes so long to form, if the soil on agricultural land becomes damaged, polluted, or erodes away, we may need to expand into areas being used for other things. Most of the habitable land not being used for farming is covered in rich wild lands (forests and shrub land) that support a diversity of plant and animal wildlife. Converting this wild land to crops for humans or livestock would harm important ecosystems. Forests are also critical in filtering the air and helping to prevent climate change.

9. What are some ways we could help protect the agricultural land that we currently use (look at the underlines in your article)?

Answers may include: keeping the soil and water clear of pollution by disposing of chemicals properly, planting trees in areas that might be prone to erosion, eating less meat and dairy, conserving energy to help reduce pollution that becomes acid rain and pollutes the soil, buying food from farmers who practice crop rotation, teaching others about the importance of protecting our soil.

10. Where else does food come from beside agricultural land?

Waterways including oceans, rivers, lakes, and streams. It is important to take care of our waterways as well as our farmland.

MEASURING LEARNING

Students write an exit-ticket that lists one reason it is important to maintain healthy agricultural land and one action that can protect current farmland.

FOLLOW-UP ACTIVITIES

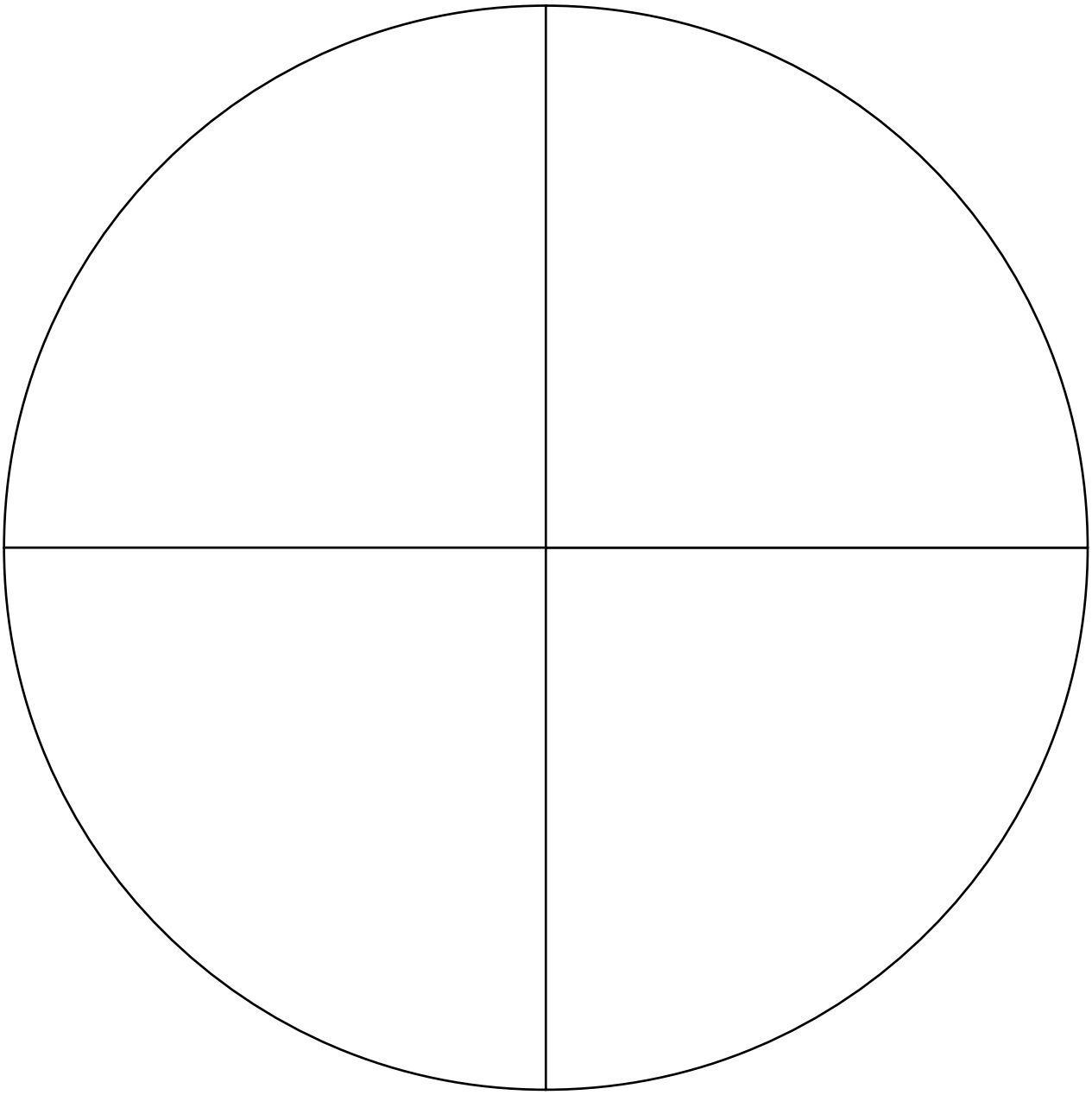
1. Arrange a class field trip to a local farm. At the farm, explore foods that come from the farm, discuss with the farmer how the farm may have changed over the years, and investigate how the farmer keeps the soil healthy.

2. Try the activity, *Scraps into Soil*, in the People and Waste Unit of this curriculum in order to further explore soil and introduce students to the concept of composting. You can use the soil from this activity to start a class or school garden.

EARTH: THE APPLE OF OUR EYE
PIE CHART TRACKING SHEET

Name: _____ Date: _____

THE EARTH'S SURFACE



GLOBAL CENTS

COUNTING ON PEOPLE
K-5 Activities for Global Citizenship

METHOD

Students develop budgets to meet the basic needs of an American family and a family in Malawi (a country in Southeastern Africa), then create a daily budget for a Malawi family living on less than $1 a day.

MATERIALS

Part 1:

- Student Worksheets

Part 2:

- *A Day in the Life of the Phiri Family* (provided)
- Student Worksheet 2

CONCEPT

There are many families around the world who must sacrifice their wants in order to meet their basic needs.

GRADE LEVEL

Upper elementary

SUBJECTS

Social Studies, Math, Family and Consumer Sciences

OBJECTIVES

Students will be able to:

- Analyze the difference between needs and wants in order to create a daily budget.
- Compare and contrast their own wants, needs, and daily lives with those of families in Malawi.
- Apply their knowledge of daily life in Malawi to create a budget for a Malawian family that stays within a cost of $1 per day.

SKILLS

Adding, evaluating, problem solving, decision making, critical thinking

INTRODUCTION

In many parts of the world, people sacrifice the comforts that are common to many Americans so that they can support their most basic needs. It can be difficult for young students to understand just how different life can be in parts of the world where families live on only a few dollars a day. Exploring the daily lives of people who live in the least developed parts of the world helps students appreciate differences in culture and lifestyles around the globe and can help them distinguish between needs and wants in their own lives.

Malawi is a small country in Southeastern Africa, about the size of the state of Pennsylvania. Despite its small size, it is home to the third largest lake in Africa, Lake Malawi, which runs the whole length of the country! Malawi is one of the poorest and most densely populated countries in the world, which makes it difficult for the needs of the population to be met. Over the years, Malawi has made progress in reducing the number of people who live on less than $1 a day. In 1990, 54 percent of the population lived on less than a dollar a day but by 2009, that number had dropped to 39 percent. By the year 2015, the country hopes to bring that number down to 27 percent, a goal that will be tough to meet. In this activity, students will investigate life in Malawi and make comparisons to their own life. In doing so, students gain an important awareness of their place in the world and their role as global citizens.

PART 1: DAILY BUDGETS

PROCEDURE

1. Ask students what they think someone needs in order to survive (food, water, shelter, energy, transportation, education, healthcare, clothes) and record student responses on the board. Encourage students to explain their thinking. Then ask what they think someone might want in order to live happily (sweets, movies, books, video games, designer shoes, vacations, sports, etc.). Record responses.

2. Divide the class evenly into two groups and give each student a copy of both Student Worksheet 1 and Student Worksheet 2.

3. Point out the differences in prices between items in the United States versus items in Malawi. Ask students if they think it would be easier for people to meet their basic needs in a place where prices are low, like Malawi.

4. Students will now pretend that they are in charge of the daily budget for a family of three living in the United States. Using Student Worksheet 1, have each student determine their needs for one day and then find the total daily cost. Next, find the total daily cost of all their needs and wants.
   Note: Be sure students understand that for most of the items on the U.S. budget sheet, the daily cost is found by dividing the yearly cost by 365 days. It is not a literal "per day" payment.

5. Now, students will be in charge of the daily budget for a family of three living in Malawi. Students should add the cost of their needs for one day, and record, and then calculate the cost of their needs and wants for one day combined, and record. All prices are converted at the rate of 127 Malawian Kwacha to the U.S. dollar (exchange rate as of October 2006).

6. Ask one group to stand up – this group represents families living in America. Explain that the average American family earns $65,527 per year (as of 2006). That works out to be about $179 per day.

7. Instruct the American families to sit down if the total cost of the family's needs for one day is greater than $179. Students who remain standing are able to meet their basic needs on a day-to-day basis (it is likely that most students will remain standing). Can these families afford some of their wants also?

8. Ask the second group of students to stand – this group will represent families in Malawi. Explain that in Malawi, the average family earns $189.81 in one year (as of 2006). That works out to be about $0.52 of earnings per day.

9. Instruct the Malawian families to sit down if the total cost of their needs is greater than $0.52. Students who sit down are not able to meet their family's basic needs on the average income of a Malawian family (it is likely that most students will sit down).

Note: Averages account for the very high incomes and very low incomes. They are good for getting a general picture but leave out the intricacies of unique family situations. For example, just because the average income in the U.S. allows families to meet their needs, this is not the case for everyone. There are families in every country who have trouble meeting their needs and must make changes to their lifestyle. However in developing countries, like Malawi, there are many more families who must do this.

DISCUSSION QUESTIONS

1. For those of you who couldn't meet your daily needs, how do you feel? Could you afford any of your wants?

2. Are there things that you could change in your needs budget in order to lower daily spending?

3. What could you afford to buy in the United States for $0.52? What about for $1.00?

PART 2: A DAY IN THE LIFE OF THE PHIRI FAMILY

PROCEDURE

In order to get a better idea of how families live in Malawi, let's look at a specific family, the Phiri family. On an average day, the Phiri family earns $0.94. On this small amount, they are able to support themselves but they live a lifestyle that is very different from life in the United States.

1. Now, students will be in charge of the budget for the Phiri family. First, read the provided story, *A Day in the Life of the Phiri Family,* to give your students some background on the typical daily life of a rural Malawian family. (Or copy the story and have students read on their own.)

2. Tell students they must re-work their Malawi budget (Student Worksheet 2) to see if they can meet their needs while keeping costs below $0.94. It is okay to go over budget, but students should try to stay as close to $0.94 as possible.

3. You could have students work in small groups of three to role play the Phiri family and discuss how they will stay within budget, then present their solutions to the class.

DISCUSSION QUESTIONS

1. What were some items you listed as needs that you had to eliminate from the Phiri family budget? Do you think any of these things will have to be added to the budget on other days?

   Answers will vary but may include: proteins like eggs and chicken, electricity and water, internet, leather shoes, home repair, etc. Yes, some things like home repair and eggs or chicken might need to be added to the budget on other days.

2. If you went over budget, why did you feel it was necessary? How might you make up for this extra expense on the next day?

   Answers will vary.

3. Do you think there are additional daily expenses that are NOT listed on the budget sheets?

   Answers will vary but may include: health care and medications, furniture, household goods (dishes, utensils, rags, cleaning supplies, etc.), reading materials/newspapers, cost of any additional food or transportation services (perhaps a car or bike), etc.

4. Imagine that the Phiris had one additional child. How would this affect their daily expenses? What if they had two or three additional children? (The average woman in Malawi has six children.)

Having an extra child would mean that the Phiris would need more food to go around, and therefore the costs of feeding the family would go up. The cost to clothe the family would also increase. While primary education in Malawi is free, these extra costs would probably make it difficult for the Phiris to pay for their children to go to secondary school. Also, the Phiris may need their children to help them work in the fields and sell goods at the market, so that the whole family can be supported. This may prevent the children from being able to go to primary school.

5. How is the daily life of the Phiris different from your own life? How is it the same?

Answers will vary.

MEASURING LEARNING

Have students create a Venn Diagram that compares their own daily life to the average life of a child in Malawi. Although there are many differences, be sure that students also include things that are the same between themselves and the average child in Malawi (needing food, water, clothes and shelter; eating special food on special occasions; enjoying music; having dreams of a career; eating as a family; having a "staple" dish, like bread; having pets). A free printable diagram can be found at this site: **www.classroomjr.com/printable-blank-venn-diagrams**.

FOLLOW-UP ACTIVITY

Read the book *One Hen* by Katie Smith Milway aloud to the class. As you read, have students record in their journals all the ways that Kojo's loan helped Kojo's family and his community meet their daily needs. After the story, have students visit the *One Hen* website: **www.onehen.org**. On the site, students play games to earn and then "donate" beads. As students invest their game beads on the site, Opportunity International (a micro-lending organization), donates real money to people around the world who are in need of a small loan. Pictures and information about the people who are benefitting from loans provided by Opportunity International are available for students to explore.

Data Sources: 2010 Millennium Development Goals Report; U.S. Census Bureau, 2006, http://www.bls.gov/cex/2006/Standard/cusize.pdf; Republic of Malawi, National Statistical Office Integrated Household Survey 2004-2005: Volume 1; National Public Radio, Living on a Dollar a Day in Malawi, Oct 1, 2006; United Nations Statistical Division; Better Business Bureau, Consumer News and Opinion Blog; The Washington Post, Summer Camp: It's Getting Too Late Early; Numbeo.com (adjusted at 2.31% to account for inflation between 2006 and 2012).

GLOBAL CENTS
STUDENT WORKSHEET 1

Name: _____ Date: _____

FAMILY OF THREE IN UNITED STATES

Item	Cost per Day	Need or Want	Why?
Food (at home)	$10.98		
Education	$3.45		
TV, Videos, Video Games	$2.88		
Clothes	$6.35		
Shoes	$1.08		
Electricity/Water	$6.56		
Meal for 3 at Expensive Restaurant *	$63.51		
Internet	$1.34		
3 Movie Tickets*	$28.05		
Healthcare	$7.86		
Family membership to Sports Club	$3.98		
Vacation - one per year	$8.22		
Meal for 3 at Inexpensive Restaurant*	$31.77		
Transportation	$28.69		
Housing	$51.37		
2 Weeks of Summer Camp	$2.19		
Sports and hobby equipment	$1.27		

*These items are completed in one day and therefore the full one time cost is listed.

Total Cost of My Daily Needs: _____ Total Cost of My Daily Needs and Wants: _____

GLOBAL CENTS
STUDENT WORKSHEET 2

Name: _____ Date: _____

FAMILY OF THREE IN MALAWI

Item	Cost per Day	Need or Want	Why?
Food			
Maize flour (for Nsima porridge)	$0.45		
Fertilizer (to grow fruits and vegetables	$0.04		
Milk	$0.08		
Eggs	$0.24		
Chicken	$1.09		
Education	$0.10		
Clothes	$0.08		
Meal for 3 at Village Restaurant*	$5.73		
Leather Shoes	$0.19		
Electricity/Water	$1.88		
Parafin (for lamps)	$0.17		
Internet	$3.13		
3 Movie Tickets*	$17.64		
Soap	$0.04		
Transportation – 1 way on local transportation*	$0.59		
Housing	$0.00		Most families live in a traditional handmade house made of mud and a thatched roof.
Home Repair	$0.02		

*These items are completed in one day and therefore the full one time cost is listed.

Total Cost of My Daily Needs: _____ **Total Cost of My Daily Needs and Wants: _____**

A DAY IN THE LIFE OF THE PHIRI FAMILY

For some families in the southeastern African country of Malawi, the daily struggles are over basic things. Malawi is one of the poorest countries in the world, almost half its population lives on less than one dollar a day. To see what that really means, let's spend a day with the Phiri family in the village of Lifidzi.

At 4:30 a.m., the Phiri family's rooster crows. There is just enough time to make a visit to the pit toilet outside and to splash water from a bucket onto our faces. Then it's time to head out to the maize field, a 20 minute walk from here. The family uses a hand-made hoe to turn the dirt. Malawi's soil has been overworked, so the family's relatives helped them pay nearly $15 for a bag of fertilizer to last the year that will help the crops grow. That cost breaks down to four cents, for the amount that will be added today. To the father of the family, 60 year old Faison Phiri, it's an expense that's worth it. If the crops fail, he says, they are hungry, and when they are hungry, he says, they can't work hard in the field. The family does not eat breakfast in the morning but Faison Phiri says that the food they ate yesterday is enough to give them energy for their morning work.

By 9:00 a.m. the sun is pounding down and it's time to head home. Back at the family's mud hut, with its corrugated iron roof, the Phiris' 18-year-old daughter Martha shreds some pumpkin leaves for lunch. She found them growing in the wild. The leaves were free, but she adds salt for flavor. And there's maize flour for making Nsima, a traditional dish, similar to grits. The cost of Martha making Nsima for lunch is 45 cents. One thing the family doesn't pay for is utilities – they don't have any electricity or running water. Instead, Martha must pump their water from a well. Martha carries the water on her head. She is used to it, but to an average American, it feels like putting a steel bucket filled with cement on your head. Martha carries water this way five times a day. She always remembers to carefully scoop out the debris, which she says, can make the family sick if left in the water. Getting sick is an expense that the family can't afford. Luckily, neighbors will help each other to buy medicine in desperate times.

During the rainy season, Martha can sell a small amount of sugar cane to the neighbors, earning the family four cents a day. It's not the career she envisioned when she graduated from high school. She'd like to be a news anchor, or as they're called here, a newsreader. Martha admires the newsreaders, especially the ones on TV, although the family doesn't have a TV of their own. But it's unlikely the family will ever have the money to send Martha to be a newsreader or anything else.

Martha and her mother will spend the afternoon collecting free firewood and preparing dinner. On special occasions, Martha heads to the market to buy fish or chicken for the family's dinner. This extravagance breaks the bank and is a treat that the family can rarely afford. At dinner, the family eats off of plastic plates and sits on the floor, being careful to keep food away from the family cat, Lion, who feeds himself by catching mice in the fields. The Phiri family lives across the street from a church, and after dinner, they listen happily to the sounds of the choir practicing their hymns. As the sun sets, they will all go to sleep in the same room, without beds, and wait for their rooster to wake them in the morning.

HOW MANY FISH IN THE SEA?

COUNTING ON PEOPLE
K-5 Activities for Global Citizenship

METHOD

Students estimate a fish population (using goldfish crackers on a flat surface) by sampling.

MATERIALS

- Blue tarp
- Masking tape
- 3 bags of Goldfish crackers (6.6 oz bags)
- 5 plastic or paper cups
- Penny or poker chip (or other small, lightweight object)
- Graph paper
- Plastic sandwich bags (1 per student)
- Uncooked rice or small pasta

INTRODUCTION

A **population** is a group of individuals (plants, animals, people, etc.) of the same species which live in a given area. Sometimes the population size can't be determined by direct count because the population may be too large to count or because the individuals move around too much to count. There are several indirect methods of counting that provide a close estimate of the population size. This activity will introduce students to one of those methods – sampling.

PROCEDURE

1. Prepare the tarp ahead of time by measuring out a 10 ft x 10 ft square. Use the masking tape to show the boundaries of the square. Then create a grid pattern on the square with the tape dividing it into 10 rows and 10 columns, so that each cell on the grid is a one foot square (100 squares in all).

CONCEPT

Sometimes the size of a population is too large to count directly but sampling can provide a good estimate.

GRADE LEVEL

Lower and upper elementary

SUBJECTS

Math, Science, Social Studies

OBJECTIVES

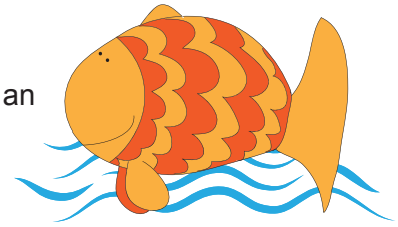
Students will be able to:

- Estimate the size of a species' population through two methods – observation and sampling.
- Provide examples of the kinds of species that could be successfully counted using direct and indirect methods.

SKILLS

Counting, multiplying, dividing, measuring, finding averages, estimating

2. Introduce students to the concept of estimation, the process of guessing the approximate value of a number. An estimate is useful when the exact value is impossible or impractical to obtain (ex. the number of stars in our galaxy) or when an approximate value is adequate. Tell students they will be estimating two ways: an "eyeball" estimate and a sampling estimate.



3. Scatter the bags of goldfish on the grid. This will be approximately 1,000 goldfish.

4. Ask students, "How many fish do you think are on the grid?" (Some will take a wild guess and others will try to figure it out visually in a more systematic way.) Write several of their answers on the board. Explain that this is an example of estimation.

5. Now tell students that some of them will go fishing "out in the ocean." Distribute cups to five students. One at a time, have each of these five students toss a small object onto the grid, such as a penny or poker chip. Whichever square the object lands on will be their fishing area.

6. Instruct students to count all of the fish within that square as they put their "catch" into their cups.

7. Write the number of each fish catch sample in a column on the board.

8. Ask students, "How can you figure out, on average, how many fish were in the squares that you counted?" (Add up the number of fish in the samples and divide by the number of samples.) Students can copy all of the numbers from the board and calculate the answer.

9. Ask students, "If this is the average number of fish per square, how can you figure out how many fish there are in all?" (Count the number of squares in the grid – 100 – and multiply the average number by 100.)

10. Compare their initial guess of how many fish there were (their "eyeball estimate") to their estimate using the samples. You can share with students that, according to goldfish per serving size and the number of servings in each bag, there are approximately 1,000 goldfish. Alternately, you could divide students in groups to do a direct count of all the goldfish.

11. Optional: Throw the fish "back into the sea," redistributing the fish around the grid. You can experiment with an even distribution of fish or a clumped distribution (where some squares have a lot of fish in them and others have none). Select five other students to take the sampling and see how the calculation compares to the one from the first "catch."

ADAPTATION FOR UPPER ELEMENTARY STUDENTS

For upper elementary students, you can incorporate basic geometry skills. Change the procedure slightly by not dividing the 10 ft x 10 ft square into a grid pattern. Have some rulers or meter sticks on hand and ask the students how they would go about taking a sample population. Once they arrive at the answer of dividing up the large square into smaller squares, let them measure the squares out and do their sampling count.

DISCUSSION QUESTIONS

1. How close was your initial estimate to the number you arrived at by sampling?

2. What type of population would be easier to count using the direct method of counting each individual? What type of population might be easier to count using sampling?

A small population in a contained area (such as rabbits in a pen) could be counted directly. Larger populations moving in a larger space (such as deer in a forest) could be counted using sampling. Sampling is also one of the techniques used to count the U.S. population during each census.

3. Why do you think scientists might use sampling to count wildlife populations? Can you think of any drawbacks to this method?

Scientists might choose to use sampling when the wildlife population is too large and/or spread out over a large geographical area to use a direct count. It may not always be the best method, though, especially if the population density among samples vary greatly or if the animals frequently move in and out of the sample area.

4. How might you estimate the population of students in your school?

Count the students in your class and find out how many classes there are in the school. Then multiply to get an estimate of the total student population.

How might you find the exact size of the school's student population?

You could count them, but it would be much easier to consult the principal or school office staff.

MEASURING LEARNING

Reinforce these estimation skills by having students estimate the population of another "organism." This time, provide students with graph paper that they can grid into one- or two-inch squares. Provide each student with a baggie of uncooked rice or small pasta (ex. orzo or macaroni). They should distribute the contents of their baggies on their grids, write down their "eyeball estimate," and then go through the sampling exercise by counting the population in at least three sample squares to arrive at their overall estimate.

FOLLOW-UP ACTIVITIY

For the fish activity, students only had to estimate in two dimensions on a flat surface. Now have them work on coming up with estimates of jellybeans (or other small objects) in a jar. Ask them how they might go about it and have them test their strategies.

Adapted from "Fish Fetch – Fisheries Survey Activity" created by Jason Conner, Alaska Fisheries Science Center, part of the National Marine Fisheries Service, NOAA.

UNIT 6 | PEOPLE AND RESOURCE USE

MORE OR LESS

COUNTING ON PEOPLE
K-5 Activities for Global Citizenship

METHOD

Students construct a word web to show the possible cause and effect relationships of a growing population.

MATERIALS

- More or Less word cards (provided)
- Masking tape
- Construction paper or chart paper (optional)
- Colored markers (optional)
- Magazines (optional)

CONCEPT

Population growth is closely linked to many environmental and social issues.

GRADE LEVEL

Lower and upper elementary

SUBJECTS

Science, Social Studies, Language Arts

OBJECTIVES

Students will be able to:

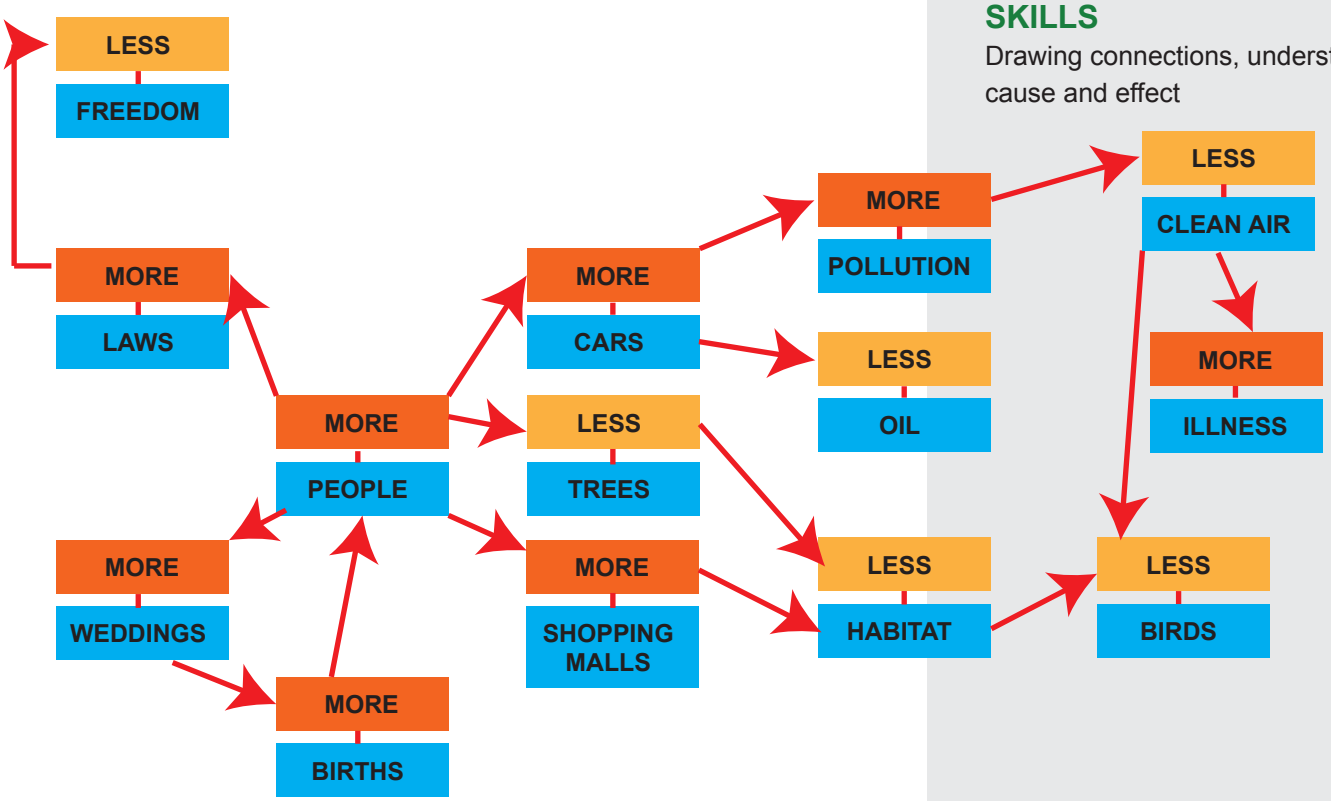
- Use critical thinking to determine cause and effect relationships between related phrases.
- Identify some of the many interconnections between the human population, resources, and the environment.

SKILLS

Drawing connections, understanding cause and effect

INTRODUCTION

"Everything is connected to everything else" is the first law of ecology. This is an important concept when making decisions about ourselves, our future, and the resources we depend on. This activity demonstrates the many cause and effect relationships that can be drawn between the human population, resources, and the environment.



PROCEDURE

1. Before class, print and cut out the provided More or Less word cards.

2. Randomly distribute the cards so that each student has either a “MORE” or a “LESS” card. Then display the other word cards so that all the students can see them. You may want to lay them out on a table or desk at the front of the room.

3. Begin making a word web by taping the words “MORE PEOPLE” on the board. Ask the students, “If there are more people, what else might we have more of? What might we have less of?”

4. Invite a student to pick a card to make another phrase that would logically follow “MORE PEOPLE,” such as “MORE CARS.” Have the student tape these two words to the board. Use strips of masking tape or draw a line to “connect” the two phrases. Make sure the students understand the difference between having more and needing more. Have them explain the connection to the class.

5. Then invite other students, one by one, to pick word cards to complete logical statements. Example: “MORE CARS” (means) “LESS OIL” (available). See how many phrases can be logically linked to the first phrase. Also encourage students to link their phrase to other phrases. Remind students that their connections can be positive, negative, or neutral.

6. Younger students can draw pictures of the words on blank construction paper cards or can write the words on their own to practice handwriting and spelling. Older students could opt to not use the printed cards, and simply use a large sheet of paper to develop their own written word web with “More People” as the organizing theme (this is best done in small cooperative groups).

DISCUSSION QUESTIONS

1. Ask students if they see any additional connections that can be made. Connect these phrases and discuss how they are related.

2. Point out a few specific connections. Are the relationships as clear-cut as they are stated? For instance, must more factories mean more noise, more pollution, or more jobs? Do more houses always mean less animal habitat?

3. Under what circumstances would the relationships in the web change?

MEASURING LEARNING

Have students reflect on the lesson through either pictures or writing. After choosing which form they will use, students should indicate at least three cause and effect relationships between people, resources, and the environment and should express what it means to them to have more people on the planet.

FOLLOW-UP ACTIVITIES

1. Work together as a class to develop your own word list, and try the activity again.

2. Upper elementary students can create a Glog (short for “graphics blog”) about what it means to have more people on the planet. Glogster.edu is an on-line learning platform where students can express their knowledge through text, photo, video, sound, and other multi-media. They can use the connections that were developed in the class web, or come up with their own connections that portray the many relationships between people, resources, and the environment. When developing their Glog, students can include relevant videos, audio clips, written articles, photos, etc. If students need guidance on where to start their research, they can check out the links on the Student Resources page in the Just for Kids section of this curriculum. Visit **http://edu.glogster.com** to begin creating Glogs.

More

More

More

More

Less

Less

Less

Less

People

Inventions

Births

Pollution

Hospitals

Habitat

Clean Air

Injuries

Money

Illnesses

Food

Land

Garbage

Deaths

Roads

Minerals

Jobs

Noise

Wars

Cars

Birds

Fish

Soil

Oil

Water

Schools

Malls

Laws

Houses

Boats

Gasoline

Weddings

Drought

Shopping

Accidents

Endangered Species

Robberies

Factories

Trees

Freedom

PEOPLE COUNT

METHOD

Students conduct a census of their schoolmates' households, graph their data, and then analyze the results to make a decision in the community.

MATERIALS

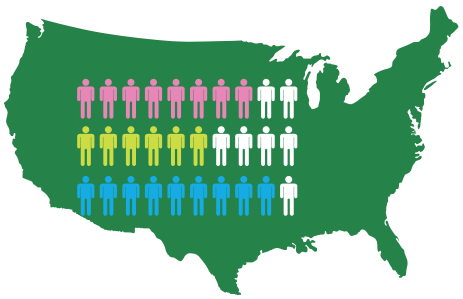
- Student Survey Sheet
- Student Worksheet
- Colored pencils
- Calculators (optional)

INTRODUCTION

A **census** is a count of people in a given area or country. In the United States, a census is conducted once every 10 years to determine the country's population. The most recent census was taken in 2020.

In 1790, Thomas Jefferson directed the first census taken in the United States. The census was conducted by the U.S. Marshals and their assistants who had to supply their own paper for the job! They found that about 4 million people lived in the United States.

With over 330 million people to count in the United States today, the census is more complex. Each household must complete a survey of questions. The answers are then tabulated. Through this lesson's introduction to census-taking, students will hone their data collection and analysis skills while learning about a real-world event and how it contributes to American society.



COUNTING ON PEOPLE
K-5 Activities for Global Citizenship

CONCEPT

A census determines the size and characteristics of a population and helps us understand the needs of a community.

GRADE LEVEL

Upper elementary

SUBJECTS

Social Studies, Math

OBJECTIVES

Students will be able to:

- Conduct a census of their peers.
- Organize collected data and use it to create a bar graph.
- Analyze data to provide informed answers for questions about the business needs of a community.
- Define what a census is and give examples of how it aids community planning.

SKILLS

Conducting a survey, collecting data, organizing data, analyzing data, setting-up and drawing a bar graph

PROCEDURE

1. If your students are not familiar with concept of a census, consider introducing them to the U.S. Census using this informative video: **2020 Census: What is the Census?**

2. Tell students that they will be taking a census of the households of other students in the school. Using the Student Survey Sheet, they will survey eight other students. For each person they select to survey, students must ask how many people live in the person's household (including themselves), and record the name and age of each household member.

3. Distribute a Student Survey Sheet to each student. Consider having students pair up and role-play the process of asking for and collecting data.

   You may want to share these helpful tips with students:

   - If interviewing a student outside of class, a simple explanation of what you're doing is useful: *"Hello, I'm doing a census project for my class. Could I ask you a couple questions?"*
   - If anyone feels uncomfortable providing information about their families, allow them to use a fictional household (from a book, movie, etc.) to complete their survey. Or, choose someone else to survey.
   - If a student has more than six members in their household, record the extra people on the back of the Survey Sheet.

4. Allow students two or three days to collect the data. To avoid just asking students in their own class, they may want to gather some of this data during lunch, recess, before, or after school.

5. Distribute the Student Worksheet to each student. (Consider printing the Worksheet single-sided so students can see and use both pages at the same time.) First, students should input the data they collected on the Student Survey sheet into the Age Cohort chart. Then, students should graph the charted data on the provided grid.

   Remind students that their graph's y-axis should begin with 0, and increase in equal increments until it reaches a number slightly higher than, or equal to, the number of people in their data set's largest age cohort. For example, if a student's largest age cohort has 15 people in it, their y-axis could increase by 3s up to 15.

6. Divide students into small groups to answer the questions on the Worksheet.

DISCUSSION QUESTIONS

1. What is a census?

   A census is a count of people in a given area or country.

2. Imagine that we took a census of all of the students in our school. What kinds of things can be determined by the population of the school?

   Answers may include: how many students are in each class, how many teachers are at the school, how many desks are needed, how many art supplies to buy, how many sports teams/clubs to have, etc.

3. What might change if there were more people in the school?

   Answers may include: there might be more people in each class; we might need more food in the cafeteria; there might be fewer books to go around in the library; etc.

4. How often does the United States have a census?

   The U.S. conducts a census every 10 years, with most recent census occurring in 2020.

5. How was your census taking experience similar to the U.S. Census? How was it different?

   Similarities: We collected data on a population and used it to decide what they might need/want; it was difficult to get people to participate in my survey; we thought about how our population would change in the future.

   Differences: We collected data just on age while the U.S. census collects data on a lot of different things; we collected data on just our school community while the U.S. census collects data on the whole U.S. population.

6. Why is it important that we have a U.S. Census?

   The U.S. Census determines a state's representation in the House of Representatives; it can identify what kinds of jobs are needed in different areas; it identifies the need for different community services and facilities; it provides retirement and Social Security information; it defines legislature districts and school districts; it establishes where federal funding is distributed; it provides information on family histories and for historical purposes.

7. What's a business idea you had for your neighborhood? Why do you think that business would do well?

   Answers will vary. Encourage students to use their collected data when explaining their reasoning.

8. Is it possible that the business would not do well? Explain your thinking.

   There might be similar businesses in the neighborhood that could act as competition; people might not all like the same thing just because they are the same age; the people in the community might have a favorite business already and not want to try out a new one.

9. What other information would you like to have about the people in the neighborhood to help you choose a business?

   Answers may include: the kind of food the people in the neighborhood like; where they like to buy clothing; the type of job they have; the types of businesses that already exist in the community and businesses that the community is lacking.

MEASURING LEARNING

Review the Student Worksheet and bar graph to gauge students' understanding of data collection and analysis from a census.

FOLLOW-UP ACTIVITIES

1. Students explore census data from their home state using the website **https://www.census.gov/programs-surveys/sis/resources/data-tools/state-facts.html**. Ask students a series of guided questions to help familiarize themselves with this data. For example: How did the population of our state change between 2010 and 2020? Did the number of kids your age increase or decrease between 2020 and 2021? How has the number of fast-food restaurants changed between 2010 and 2020?

2. Students write an informative newspaper article about an imaginary new business that is coming to the students' neighborhood. The article should include a summary of the business's purpose, the business's name, and how the business will benefit the community.

PEOPLE COUNT
STUDENT SURVEY SHEET

Name:_____ Date:_____

Use this sheet to conduct a census of eight households. Ask each person you survey the name and age of all the people living in their home, including themselves. If a person does not want to participate in your census, they can make up a fictional household, or you can ask someone else.

#1	NAME	AGE
1		
2		
3		
4		
5		
6		

#2	NAME	AGE
1		
2		
3		
4		
5		
6		

#3	NAME	AGE
1		
2		
3		
4		
5		
6		

#4	NAME	AGE
1		
2		
3		
4		
5		
6		

#5	NAME	AGE
1		
2		
3		
4		
5		
6		

#6	NAME	AGE
1		
2		
3		
4		
5		
6		

#7	NAME	AGE
1		
2		
3		
4		
5		
6		

#8	NAME	AGE
1		
2		
3		
4		
5		
6		

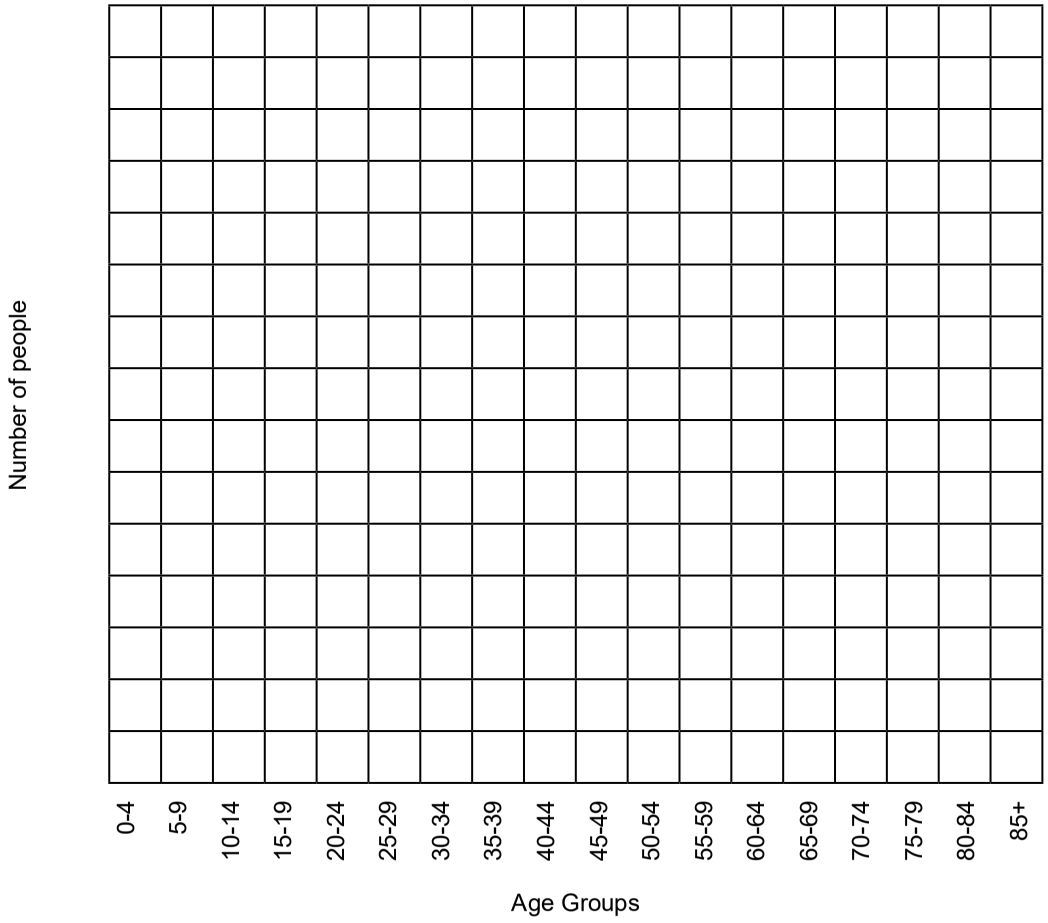
PEOPLE COUNT | STUDENT WORKSHEET

Name:_____ Date:_____

Organize and graph the data you collected. First, fill in the chart on the left. Place a tally mark under Total Number for every person you surveyed in each Age Group.

Second, create a bar graph of this data on the grid. Start by determining the scale for the y-axis (vertical axis along the side of the graph) and list the Number of People up the y-axis. Then, fill in the bar graph with the data from the "Total Number" column of the chart on the left.

AGE GROUP	TALLY MARKS	TOTAL NUMBER
0-4		
5-9		
10-14		
15-19		
20-24		
25-29		
30-34		
35-39		
40-44		
45-49		
50-54		
55-59		
60-64		
65-69		
70-74		
75-79		
80-84		
85+		
Total		



1. According to your data, which age group, or groups, have the most people?

2. According to your data, which age group, or groups, have the fewest people?

3. Imagine that all of the households you gathered data for were located on the same city block. What types of businesses might do well if they opened in that neighborhood? (Hint: Think about the goods and services that this particular population would need.) Use data to explain why you think they would do well.

4. How do you think your chart and graph might change if you surveyed the same people in five years?

5. Would there be another type of business that you might want to open in that neighborhood in five years? Explain.

6. How does knowing the population size help us plan to meet the needs of the community.

MINING FOR CHOCOLATE

COUNTING ON PEOPLE
K-5 Activities for Global Citizenship

METHOD

After matching everyday products to their rock or mineral sources, students "mine" chocolate chip cookies to discover the impacts of many mining operations.

MATERIALS

Part 1:
- Student Worksheet

Part 2:
- Hard chocolate chip cookies (1 per student)
- Toothpicks
- Napkins
- Mining Area Grid (provided)

INTRODUCTION

Many of the products we use everyday – from plastic water bottles to wrist watches and crayons to headphone wires – are produced from rocks and minerals mined from the earth. These rocks and minerals are considered a **non-renewable resource** because there is only a set amount of each and once it is used up, it will be gone forever. Some of these resources are very common and others are scarce. As the human population has grown, the demand for these resources has grown as well.

Extracting rocks and minerals from the earth is typically done by mining. Large scale mining operations are used all over the world and can often damage the land on which they take place. Unfortunately, the end result of mining (the profits made by selling the ore) can at times overshadow the damage done by the process (destroyed animal habitat, clear cutting of trees, pollution of local streams, etc.).

CONCEPT

Nonrenewable resources are mined from the earth to meet the wants and needs of humans and there are often environmental costs to the mined land as a result.

GRADE LEVEL

Upper elementary

SUBJECTS

Science, Social Studies, Math

OBJECTIVES

Students will be able to:
- Use observation to make an estimation.
- Identify the difficulties of mining ore from the earth.
- Describe how mining operations can affect the land.
- Examine the opportunity costs associated with full-scale mining operations and name two examples.
- Match everyday items with the ore from which they are made.

SKILLS

Estimating, drawing connections, fine motor skills, brainstorming

PART 1: MINERAL MATCHING

PROCEDURE

1. To get your class thinking about how we depend on mined rocks and minerals, distribute copies of the Student Worksheet and have them fill it out. The worksheet asks students to match up some common household items with the rocks/minerals from which they were made. After students have completed the worksheet, go over it as a group.

2. Ask students to name some items which they enjoy using. This might include television, computer games, MP3 players, certain toys, and appliances. After listing their suggestions on the board, have the students brainstorm as a class what elements from the ground, perhaps some that were on the worksheet, may have been used to produce each item. For instance, electronic equipment may have a plastic shell (a petroleum product), copper wiring, etc. Some of them may be obvious, others they may have to look up. You could extend this as a library activity for finding out some of the answers.

STUDENT WORKSHEET ANSWERS

1.E; 2.L; 3.M; 4.P; 5.D; 6.N; 7.A; 8.B; 9.O; 10.K; 11.C; 12.H; 13.F; 14.Q; 15.J; 16.G; 17.I

PART 2: HANDS-ON MINING

PROCEDURE

1. Distribute the cookies to the students (but they must not eat them!). Explain that the cookies represent the land and the chocolate chips represent an ore, like coal, which they will be mining from the cookie. With the cookie flat on the desk, and without picking it up, ask students to estimate the number of chips in their cookie.

2. Distribute a copy of the Mining Area Grid to the students. Explain that the images on the grid represent various attributes of the environment where they'll be mining. Students should place their cookie on the grid and, using a pencil, trace the outline of the cookie.

3. With their toothpicks, students will attempt to extract the chips from the cookie. Cookies should stay flat on the paper (in the real world, you can't pick up the earth and dig from the bottom!). After a few minutes of mining, ask students if they wish to change their estimate of how many chips are in their cookies.

4. After students have finished mining their cookies, have everyone outline the area on their grid paper that is covered by cookie crumbs. A rough estimate is fine; this doesn't need to be exact.

5. Have the students share their experiences. What was their goal at the beginning of the activity – to extract many chips or keep the cookie intact? What was their mining strategy? Did they experience any difficulties? Do they think mining companies might have the same kinds of difficulties?

6. Ask the students to count the number of chips they extracted. (Broken chips can be combined and counted as one chip.) Have the class look at the cookies of the students that extracted the most chips and the least chips. Do the cookies look different? Do they see a connection between the amount of chips extracted and the state of the cookie?

7. Now have the students "reclaim" the land. Using just the toothpick (no hands!) instruct them to try and get the cookie crumbs and pieces back inside the original circle. Is it difficult? Do they think reclaiming actual mined land would be difficult?

8. Ask the students to count how many squares on their grid paper have any bit of cookie in them. What attributes are located in those squares?

DISCUSSION QUESTIONS

1. Which students did the most damage to the earth? (*The students who covered the most squares on the grid paper.)* Which students make the most money from their mining operations? (*The students who extracted the most chips.)*

2. Opportunity cost is the value of the next best choice that one gives up when making a decision. For example: If you choose to go see a movie, you cannot spend that time reading a book and you cannot spend the ticket money on something else. The opportunity cost of attending the movie is the pleasure you'd have reading and the price of the ticket. The opportunity cost of using a resource, is the value of an alternative use of that resource.

In regards to the cookie, what is the opportunity cost of "mining" your cookie and turning it into crumbs?

Getting to enjoy the cookie as a snack.

3. We put a monetary value on the rocks and minerals mined from the earth. Do we put a price on the natural attributes included on the grid and the services they provide – trees that provide oxygen, vistas that provide beautiful natural views, etc? Why not? Would it be possible?

Answers will vary.

4. What do you think it means when an attribute square on your grid has cookie on it?

That the specific natural attribute has been damaged or lost.

Thinking specifically about the water, does covering just one or two "water squares" with cookie impact just those two squares or does it impact additional squares?

It impacts all of the water squares downstream. The water is moving down the stream so pollution at any point will have an impact on the entire resource.

5. What about the squares that have been "reclaimed" – those located between the original circle and the

new outline. Just because they're no longer covered by cookie, do you think that area is completely back to normal?

No. Even the reclaimed land will be different than it was originally.

When you first put your cookie down on the grid, did you consider what natural attributes you'd be covering? What was your reasoning for the cookie's placement?

Answers will vary. Some students may have tried to cover the least total natural attributes; others may have tried to cover a small amount of many types of natural attributes or mostly only one type. Alternatively, some students may not have thought about what was being covered.

6. Have students brainstorm ways to reclaim their cookies (put them back together). They might think to use frosting to stick the pieces together, or get the crumbs wet and mush them back together. But will the cookie ever be the same as it was?

MEASURING LEARNING

Review the Student Worksheet and have students write a journal entry about their experiences mining the cookies. Have them answer the following questions:

a. What was my original goal when I started mining the cookie? What difficulties did I have while mining my cookie?
b. If I were to mine another cookie, would I have the same goal? If not, what would my new goal be and why?
c. How is your experience similar or different than the goals and difficulties of real mining operations?
d. Give an example of a time when you had to make a choice. What did you choose to do and what was the opportunity cost of that choice?

FOLLOW-UP ACTIVITY

Because minerals are nonrenewable resources, they need to be conserved and recycled so that we don't run out of minerals that are in short supply. Select several of the minerals listed on the Student Worksheet and ask students to offer suggestions on how these elements might be conserved. For instance, tin and aluminum cans are often recycled as part of curbside recycling programs. Tin cans can be washed and reused as containers for pennies or paper clips. Gold can be melted down and redesigned for other uses. Aluminum cans can be remade, saving 95 percent of the energy used to make new cans from newly mined aluminum.

MINING FOR CHOCOLATE
STUDENT WORKSHEET

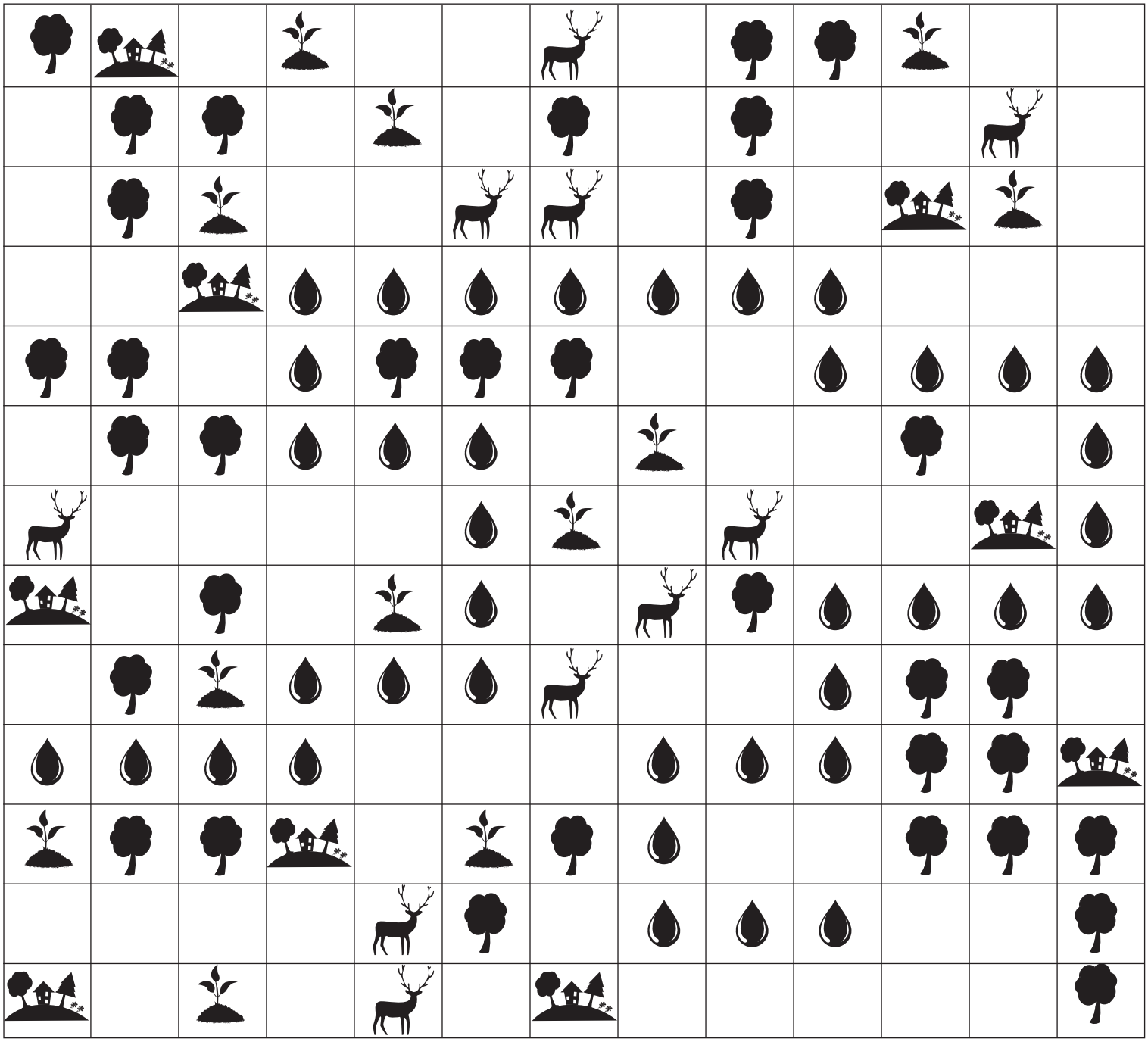
Name: _____ Date: _____

Everything listed below is produced using minerals mined from the ground. In the blank to the left of the items listed, write the letter of the element from which these items were made. The elements are listed at the bottom of the page.

1. _____ Soup cans
2. _____ Matches, gunpowder, rubber
3. _____ Watches, radios, televisions, radar instruments
4. _____ Pencil
5. _____ Bricks, pottery, tennis courts
6. _____ Pennies, stereo wire, brass instruments
7. _____ Wedding band, first-place medal, nuggets
8. _____ Soda pop cans, foil wrap, baseball bats, house siding
9. _____ Horseshoe, hammer, steel products (cars, nails, swords)
10. _____ Food seasoning and preserver
11. _____ Plastics, heating fuel, gasoline, vinyl, synthetic fabrics
12. _____ Old five-cent coins, paper clips
13. _____ Baby powder, crayons, soap
14. _____ Jewelry, drill bits
15. _____ Most common source of electricity in the U.S.
16. _____ Pipes, old paint, X-ray shields
17. _____ Flatware (forks, knives, spoons), jewelry, second-place medal

A. Gold
B. Aluminum
C. Oil (Petroleum)
D. Clay
E. Tin
F. Talc
G. Lead
H. Nickel
I. Silver
J. Coal
K. Salt
L. Sulfur
M. Quartz
N. Copper
O. Iron
P. Graphite
Q. Diamond

MINING AREA GRID



Natural Attributes:


Deer habitat


Water


Tree


Rich top soil


Beautiful vista

PANTHER HUNT

People and the Planet
Lessons for a Sustainable Future

INTRODUCTION

Whether panthers in a forest, ants in the soil or humans on the Earth, all species face limits to their population size based on the amount of resources available. The maximum number of a species that can sustainably live in a given area based on the available resources is called **carrying capacity**. For an animal species, carrying capacity depends on many different factors including the availability of food and competition from other animals, as well as access to shelter, water, and clean air. Humans can also be a factor impacting carrying capacity of a habitat. If human encroachment impacts the amount of prey available, reduces shelter, or pollutes the water or air, carrying capacity can decrease. On the other hand, if humans work to restore a habitat to its natural balance it may be able to support more wildlife.

MATERIALS

- 200 3-oz paper cups

PROCEDURE

This lesson is divided into two rounds. In Round 1, students explore the basics of carrying capacity through a simulation. In Round 2, students consider various human impacts that could impact carrying capacity and re-run the simulation with modifications. If time is limited, it is not necessary to complete Round 2.

ROUND 1: UNDERSTANDING CARRYING CAPACITY

1. Before class, label the bottom of each cup to represent a prey animal.

CONCEPT
Every habitat has a carrying capacity for the number of animals it can support and human actions can impact that carrying capacity.

OBJECTIVES
Students will be able to:

- Define carrying capacity and explain how it relates to an animal species.
- Examine how human actions can impact the carrying capacity of a habitat.

SUBJECTS
Science (life, Earth and environmental), social studies, math

SKILLS
Modeling natural systems, analyzing data, identifying trends and patterns, observing, comparing and evaluating

METHOD
Students act as panthers hunting for food in a model habitat to learn about carrying capacity and explore changes that occur because of human actions.

For classes of 25 students: use 200 cups and label them as follows:

80 cups marked S
60 cups marked R
36 cups marked P
22 cups marked B
2 cups marked D

For other class sizes: multiply the number of students participating by 8. This is your total number of cups.

Mark 40 percent of the total cups with an S
Mark 30 percent of the total cups with an R
Mark 18 percent of the total cups with a P
Mark 11 percent of the total cups with a B
Mark 1 percent of the cups with a D

2. Write the animal each cup represents and its weight on the board.

S = Squirrel (1 kg)
R = Rabbit (2 kg)
P = Porcupine (7.5 kg)
B = Beaver (20 kg)
D = Deer (75 kg)

3. When ready to begin the simulation, indicate the area where you have set out the cups, and say, *"This is the habitat of a population of panthers and each of you represent one panther. The paper cups spread around the room represent your prey; each prey animal provides you with a specific amount of food. On my signal, you will try to collect enough food in this habitat to survive for about a month, 50 kg."*

Explain to students that 1 kg = 2.2 lbs, so 50 kg = 110 lbs. It may be helpful to show the class a picture of a panther.

Note: If you plan to include Round 2 to show human impacts on the habitat, tell students this hunting is the first of several.

4. Read aloud, from the board, what each cup represents and its weight to be sure students understand what they're hunting. Ask each student to set up a panther den by selecting a small area where they will bring their prey. This could be their desks or areas along the wall.

5. Give students the following instructions:

"Each panther must walk into the habitat to hunt. (Panthers don't run down prey, they stalk it.) When a panther finds a prey animal, they pick it up and carry it to their den. Each panther can only carry one prey animal at a time. Remember that in the wild, panthers don't fight over prey, as a resulting injury may kill them. Once the prey is in a panther's den, it is safe from other panthers (panthers don't steal). You should hunt until all the prey has been collected."

6. When all the paper cups have been gathered, the hunting is over. Students should return to their desks to calculate the total kilograms of food they collected.

7. Ask the panthers who survived (gathered 50kg or more) to raise their hands and record the number on the board. Ask students, "Is this the maximum number of panthers that can survive in our habitat? Why or why not?" (*The number of surviving panthers is likely NOT the maximum number that could have survived in the habitat. This is because some panthers most likely collected more than 50 kg. Also, if panthers were able to combine their prey, more panthers could have survived.*)

   Ask: "How can we calculate the maximum number of panthers that could survive in this habitat?" (*Add up all the prey in the habitat – 1060 kg for a full set of 200 cups – and divide by the amount each panther needs to survive, 50 kg. If a full set of 200 cups is used, 21 panthers could have survived*).

8. Explain to students that the maximum number of panthers that can survive in the habitat is called the panther's carrying capacity. Define the term, carrying capacity.

   Carrying capacity: the maximum number of a species that can sustainably live on the resources in an area.

9. To integrate more mathematics, try one of the following options:

   a. Students determine combinations of prey animals that would have allowed them to survive (get 50kg) and write algebraic expressions to show their answers. Answers can be solely based on math, and not restricted by how much of each prey was available in the class simulation.

   b. Students imagine they are wildlife biologists and would like to double the carrying capacity of panthers for the habitat. How many additional kilograms will the habitat need? How much of each type of prey will the habitat need? For a challenge, have students also maintain the balance of species from the original habitat. (Students will need to start by knowing how much of each prey was in the original habitat in order to set up a ratio.)

   c. In small groups, students make a graph to represent their prey data. You could give them parameters (i.e. they must make a bar graph, they must combine everyone's prey, they must graph total weight, etc.) or leave it open-ended and have students justify the method/s they chose for representing the data.

10. Go over the Round 1 Discussion Questions:

    a. Ask the surviving panthers to raise their hands. Do you notice anything about where these surviving panthers are located? Where are they in relation to the food supply?

       Often, the students seated closest to the paper cups will survive while those further away will not.

    b. In this simulation, the panthers' carrying capacity was determined only by food. What other resources would impact the carrying capacity of an area for a given animal species?

       Any resource that the species needs to survive – shelter, water, air, space, etc.

c. Though this simulation is about the carrying capacity of panthers in a region, do the same rules apply to humans? How are they similar and dissimilar?

Yes. Similarities include: humans are at the top of the food chain; just as the panthers compete for prey, humans compete for a number of limited resources within our own habitat, or society; in some cases, whether or not you get resources depends on how close you are to them (your access level and their availability). Dissimilarities include: humans generally don't stop "hunting" when we have enough of something (we continue competing for things that we don't really need while panthers stop when they are full).

d. This activity modeled the carrying capacity of panthers in a habitat. What are the strengths of the model we used? What are the weaknesses?

Strengths could include: we competed for prey just like panthers do in the wild; some panthers didn't survive the season; the model illustrated how there are limits to the number of species that can survive on the resources in a habitat. Weaknesses could include: panthers in the wild generally have large territories so have less competition for food; we don't know if the hunting was sustainable because we only modeled one hunting season, the model bases the panthers' carrying capacity only on food and doesn't account for other factors that impact survival.

If doing Round 2, skip questions e - g and move to Round 2: Human Impacts

e. Imagine a dam was built and diverted water away from our habitat. How might this change the habitat? How could we represent this in our model of the habitat? How would this impact the carrying capacity of panthers?

If a dam was built and water was diverted from the habitat, all the beavers would leave or die out. We could show this in our habitat model by removing all the beaver cups. With no beavers in the habitat, the carrying capacity of the panthers would drop because the panthers' food supply would be cut and therefore, fewer panthers would survive.

f. What other human actions might decrease the carrying capacity of panthers in this habitat? How could we show this in our model? How would a lower panther population impact the rest of the habitat?

Answers may include: The carrying capacity of the panther habitat might decrease if humans begin to develop the habitat (cut down trees for timber, harvest plants for medicine), hunt for sport, build a highway through the habitat, or pollute the land or water. In our model, we could remove prey cups from a corner of the room to represent human development (fewer resources available), use desks to represent a road that blocks off some of the prey, or remove some prey animals that may have been affected by pollution.

If there were fewer panthers in our habitat, the balance of the ecosystem would shift – population levels of the prey animals would increase; over-grazing would affect plant populations, causing food shortage; there would be more competition for resources, etc. One change in an ecosystem may alter the carrying capacity for many different species.

g. Imagine that the body of water in this habitat became polluted. In addition to possibly decreasing the health and number of prey animals, how else could polluted water impact the panthers?

*The panthers and all the other animals drinking the water would become sick and some may die. In addition, the panthers would have the highest concentrations of pollutants in their bodies because panthers are at the top of the food chain - they eat the other creatures that are also drinking the water. This is called **bioaccumulation**. Not only are they consuming the polluted water themselves, they are taking in all of the pollution that is stored in the tissue of each animal they eat.*

ROUND 2: HUMAN IMPACTS

1. Ask students, "What things might impact the resources in a habitat and thus influence carrying capacity? Are they natural, human-caused, or both?"

Both natural factors and human actions can impact the resources in a habitat and have an influence on carrying capacity. Natural factors such as disease or natural disasters can decrease carrying capacity, while a robust resource base or good climate conditions can increase carrying capacity. Human actions such as hunting, logging or polluting can destroy habitat, negatively impacting carrying capacity. Alternatively, humans can protect or even increase the area of habitats through actions such as planting trees, composting to create nutrient soil, or reclaiming wild areas as reserves or parks.

2. Explain to students that in this Round, you'll be investigating how the habitat, and the carrying capacity of panthers, could be impacted by human actions.

3. As a class, decide what human impact you'd like to model in the habitat. Ideas could include a development or a road being built, polluted water, etc. Have students write down predictions for how they think this change will impact the carrying capacity of panthers in the habitat.

4. Ask students to brainstorm how to change the simulation to show the impact that the class has chosen to model. They can consider changes to the rules of the game, the prey available, the set-up of the habitat, etc. The chart below includes some possible ideas.

Human impact	**Possible change and habitat adjustment**
A dam is built and there is less water	Remove beavers
A road is built through the habitat	A line of desks or tape on the floor blocks part of the habitat or divides the room and panthers can only hunt on the side where their den is located.
Water becomes polluted	Remove a lot of beavers and some of the other prey animals
Water becomes polluted and there is bioaccumulation	Use dry beans to represent pollution. Place a small number of beans under small prey animals and a larger number of beans under the larger prey animals. After hunting, panthers count their "pollution consumed" (the beans) to see the impact of bioaccumulation.
Deforestation occurs	Remove a lot of prey animals
A development is built	Remove prey animals from one section of habitat

5. Using the changes students have decided on, set-up the habitat and prey cups, and then hunt again! Students can help put the cups out to save time.

6. Follow the same procedure as in Round 1 to determine the number of surviving panthers as well as the panther carrying capacity of the habitat. Then discuss the outcome – were students' predictions correct?

7. Finally, ask students to brainstorm ways to restore the carrying capacity of panthers.

8. Go over the Round 2 Discussion Questions:

   a. How would a lower panther population in this habitat impact the other species?

      If there were fewer panthers, the balance of the ecosystem would shift – population levels of the prey animals would increase; over-grazing would affect plant populations, causing food shortage; there would be more competition for resources, etc. One change in an ecosystem may alter the carrying capacity for many different species.

   b. Do you think your idea to restore the carrying capacity of panthers in the habitat would work? Why or why not?

      Answers will vary.

   c. Imagine the population of humans increased near this habitat. What further changes might occur in the habitat? How might carrying capacity be impacted?

      More humans nearby might lead to more development, more roads, or more pollution, which would all further disrupt the ecosystem and decrease carrying capacity.

   d. Can you think of an example, either in your community or elsewhere, when human actions disrupted the balance of an ecosystem? Can you think of an example of humans protecting or restoring a habitat?

      Answers will vary.

   e. What human actions might impact the natural resources that we rely on as humans?

      Many of the actions that impact species in wildlife habitats, also impact humans. For example, humans can be impacted by deforestation, polluted waterways and oceans, lack of healthy soil, etc. Human actions also cause climate change, which threatens the health of both humans and animals on Earth.

ASSESSMENT

Students finish the following sentence starters:

The carrying capacity of a habitat is....

Two things that impact the carrying capacity of a habitat are....

FOLLOW-UP ACTIVITIES

1. Students diagram the trophic levels of the habitat. You may also want them to add a species to the habitat in order to add a trophic level (a producer or a secondary consumer).

2. Students research a habitat local to their school to learn about the species that live there and any factors that may be influencing the habitat's carrying capacity.

3. Introduce students to the story of wolves in Yellowstone National Park. After a decline in the wolf population, there was a ripple effect through the ecosystem which was only restored once scientists considered all the complex interconnections between predators, prey, and their habitats.

Adapted with permission from Joan Wagner, Science Education Consultant/Author, Focus on Learning, Albany, NY. Based on "How Many Bears Can Live in the Forest?" an activity developed by Project WILD, (www.projectwild.org) ©2000.

POPULATION CIRCLE

POPULATION EDUCATION

LESSON PLAN

INTRODUCTION

Centuries ago, before people knew how to prolong life with modern medicine, better nutrition and sanitation, the human population grew very slowly. While birth rates were high, death rates were also high, keeping the population from growing much. In modern times, we have greatly reduced death rates, but in some parts of the world, birth rates still remain relatively high. Because there are more births than deaths each year, the human population grows. Even a small population growth rate can cause the population size to double in a short time.

MATERIALS

Counting Cards (provided)
Yarn or masking tape

PROCEDURE

1. Before class, cut out the Counting Cards.

2. Using tape or yarn, create a circle on the floor about 10 feet in diameter. (If using yarn, measure 30 feet of yarn and tie the ends together.) Ask the class to gather around the outside of the yarn and explain that the circle represents the Earth. You will be looking at how the population of the Earth has changed during a 500-year span by simulating world population growth from 1525 to 2025.

3. Distribute the 32 counting cards. (If you have fewer than 32 students, you may use chairs or some other item to represent additional people.) Each card represents 250 million people. Explain the simulation by reading the following paragraph aloud:

"We will be counting out loud from 1 to 100 to see how our population has grown. As we count, each time we say a number, we are going to jump ahead five years into the future. We'll start in the year 1525 (with "0") and end in the year 2025 (with "100"). When we reach 100, all 500 years will have passed. Listen for the number in the middle of your card and when it's called, step into the circle. Each time someone steps into the circle, it represents 250 million people being added to the world's population."

OVERVIEW

Concept

Over the past few hundred years, human population has grown exponentially, creating a "population explosion." The history of human population growth is a fitting real-world example of exponential growth.

Objectives

Students will be able to:

- Describe the trends of human population growth.
- Explain the basic attributes of exponential growth (slow start, fast finish).

Subjects

Social studies (history), math, science (Earth and environmental, life)

Skills

Modeling population growth, identifying trends and patterns, critical thinking

Method

Students experience the changing pace of population growth by actively simulating the Earth's population growth over a 500-year span.

4. Ask the two students holding cards with the number "0" to stand in the circle to represent the world's population in the year 1525. Explain that the two students represent everyone who lived on Earth in 1525, about 500 million people. Today, about 8 billion people live on Earth, and the population is expected to continue to grow into the second half of the century.
5. Ask students to predict the number when they think the third person will enter the circle.
6. As a group, start counting at a comfortable pace with students entering the circle when their numbers are called. Stop when you reach 100.

DISCUSSION QUESTIONS

1. What did you observe about how global population changed over time?

   It took a long time to add anyone to the circle (not until number 45!), but towards the end, at least one person was entering the circle for each number, meaning that the population was growing very fast.

2. Based on what you saw happening to the population, could you describe human population growth as exponential growth?

   Yes, the slow start followed by a fast and sudden increase indicates that the population is increasing in size exponentially. Very few people joined the circle at the beginning of the counting; most people stepped into the circle after we got to numbers in the 80s (meaning 400 of the 500 years had passed). Growth started out very slowly but finished quickly, a sign of exponential growth.

3. What changes have occurred over the past 500 years that enabled people to live longer lives, and as a result, enabled global population to increase?

   Answers may include: advances in food production have led to healthier nutrition, better sanitation and waste disposal has led to a reduction in the spread of disease, medical advancements have meant that people are living longer, healthier lives – we are now able to cure diseases that used to be deadly, new forms of transportation have been able to move these new technologies and new ideas at a faster pace.

4. What would happen if we continued to grow at the current rate? Can you think of any challenges that would be caused by a larger population? Can you think of any benefits of a larger population?

   The Earth would become more crowded. Encourage students to think of any social issues or social wins that might occur with a higher population as well as the resulting changes in resource use.

ASSESSMENT

Ask students to sketch what a graph of this dataset might look like if dates were on the x-axis and population was on the y-axis. Or have students create their own unique illustration or representation of this data on paper.

FOLLOW-UP ACTIVITY

Add a geographic component, and see where on the Earth the population is increasing. Visit www.WorldPopulationHistory.org and watch the 5-minute video illustrating population change overlaid on a map of the world.

POPULATION CIRCLE COUNTING CARDS

0 (1525)	**0** (1525)	**45** (1750)	**56** (1805)	**65** (1850)
73 (1890)	**77** (1910)	**80** (1925)	**83** (1940)	**85** (1950)
86 (1955)	**87** (1960)	**88** (1965)	**89** (1970)	**89** (1970)
90 (1975)	**91** (1980)	**92** (1985)	**92** (1985)	**93** (1990)
93 (1990)	**94** (1995)	**94** (1995)	**95** (2000)	**96** (2005)
96 (2005)	**97** (2010)	**97** (2010)	**98** (2015)	**98** (2015)
99 (2020)	**100** (2025)			

THE STORK AND THE GRIM REAPER

People and the Planet
Lessons for a Sustainable Future

INTRODUCTION

Every year, babies are born and people pass away. These events impact the size of our human population. The number of instances of each dictate the global **birth rate** (annual births per 1,000) and **death rate** (annual deaths per 1,000). These two statistics play a large role in population size, determining if a population will grow, shrink, or remain the same size.

Globally, the current birth to death ratio is 19 births for every 7 deaths. Whenever a species' birth rate exceeds its death rate, that species' population will grow. For over 200 years, humans have had a birth rate much higher than the death rate, causing global population to grow since the early 1800s. Prior to that, the worldwide birth rate and death rate were much closer together, resulting in a more stable global population.

MATERIALS

- Large clear container
- Large opaque bowl
- Water
- Name Tags: "Stork" and "Grim Reaper" (provided)
- Masking tape
- Set of measuring cups
- Food coloring

PROCEDURE

1. Before class, fill the opaque bowl with water and the clear container about 1/4 full with water. Add food coloring to both bowls so the water will be more visible. Place a piece of tape on the clear bowl at the top of the water line to mark the water's original level. Set up the demonstration by placing the clear bowl on a table in front of the opaque bowl.

CONCEPTS

Population growth occurs when a species' birth rate exceeds its death rate.

OBJECTIVES

Students will be able to:

- Define birth rate and death rate.
- Describe how birth and death rates affect population size.
- Explain why death rates have dropped in recent history.

SUBJECTS

Social studies (geography), math, science (life)

SKILLS

Observing, critical thinking, identifying trends and patterns

METHOD

In a short demonstration, students observe how populations grow when the birth rate exceeds the death rate.

2. Go over the following definitions with the class.

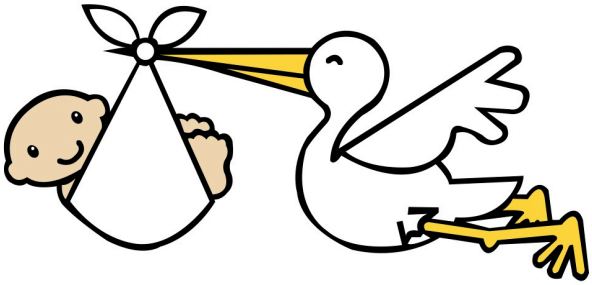
   Birth rate: number of births per 1,000 people in a given year

   Death rate: number of deaths per 1,000 people in a given year

3. Ask student to hypothesize how the birth rate and death rate impact population numbers.

4. Hold up the clear container and explain the following:

   "We'll explore how birth and death rates impact population size through a short demonstration. This clear bowl represents the world and the colored water inside the bowl represents all the people currently living on the planet. To represent births, we will add water to the clear bowl, the Earth. To represent deaths, we will remove water from the clear bowl."



5. Ask for two volunteers from the class to assist. Designate one the "Stork" and the other the "Grim Reaper"* and give them the appropriate name tags. The Stork will represent the birth rate by adding water to the clear bowl from the opaque bucket. The Grim Reaper will represent the death rate by removing water from the clear bowl back into the opaque bucket.

6. Provide the class with the following global statistics:

   2020 birth rate (world): 19 per 1,000

   2020 death rate (world): 7 per 1,000

   This means we'd expect 19 people to have a child and seven people to reach the end of their lives over the course of one year within a populaton of 1,000 people.

7. Ask the class to consider these rates and determine which volunteer should get the larger measuring cup and why.
   Answer: The Stork should have the larger measuring cup because the birth rate is higher than the death rate; more people are being born every year than are passing away.

8. Give the 1-cup measure to the Stork and the ⅓-cup measure to the Grim Reaper. Signal them to start their tasks of moving water – going back and forth with the Stork adding 1 cup of water to the clear bowl and the Grim Reaper removing ⅓ cup of water from the clear bowl. They should continue in turn while the class observes. When it becomes clear that the water level is steadily rising, the Stork and Grim Reaper can stop.

*The 'stork' and 'grim reaper' are personifications of birth and death that originated in European mythologies. If some of your students are from other parts of the world, you can explain these icons and find analogous figures from their own cultures.

DISCUSSION QUESTIONS

1. What happened to the level of the water throughout the demonstration? (Reference the tape on the clear bowl marking the original water level if needed.) Why did this happen?

   The water rose because more water was being added to the bowl than taken out.

2. What does this show about how birth and death rates impact population growth?

   When the birth rate is greater than the death rate, a population grows.

3. What size would the Stork's measuring cup have to be for the water level to stay the same? How would you represent this as a ratio?

   The same size as the Grim Reaper's measuring cup – in this case, 1/3 cup. The ratio would be 1:1.

4. Throughout most of history, the Stork and Grim Reaper's real-life measures were usually about the same size. What would equal-sized measuring cups tell us about a population?

   It would mean the birth rate and death rate were the same and population was stable.

5. Over the last 200 years and starting with the Industrial Revolution, the Grim Reaper's measuring cup has become much smaller than the Stork's. Can you think of some reasons why the death rate has gone down in recent years?

   *Since the onset of the **Industrial Revolution**, many technological advances, social movements, and improved conditions have caused the death rate to decrease. Many areas around the world saw advances in medicine (including vaccines, antibiotics and life-saving procedures), improved sanitation, improved nutrition, new workplace safety measures, better education, etc. Additionally, transportation allowed new technologies, inventions, and ideas to move from one place to another quickly.*

   All of these things worked to allow more people to survive infancy and childhood and extended the average life span. People used to only live to be about 40 or maybe 50, whereas now many people survive much longer.

6. What is an example of a birth rate to death rate ratio that would cause a population to increase in size? What is an example of a birth rate to death rate ratio that would cause a population to decrease in size?

   Any ratio where the birth rate is larger than the death rate would cause an increase in population – 30:10, 12:11, etc. Any ratio where the birth rate is smaller than the death rate would cause a decrease in population – 6:13, 5:24, etc.

7. In the demonstration we add and subtract water from the bowl. How could we represent this numerically? What math equation would show what is happening with the water?

   +19-7=12 12+19-7=24 24+19-7=36

ASSESSMENT

Read the following statements aloud. Students raise their hands if the statement is correct. If the statement is incorrect, they should keep their hands down.

1. If the birth rate and death rate are equal, a population is stable and will not grow. *(Correct – hands up)*

2. If the birth rate is larger than the death rate, a population will decrease in size. *(Incorrect – hands down)*

3. The global death rate has not changed over the past 200 years. *(Incorrect – hands down)*

4. The current global birth rate is larger than the death rate and as a result, global population is increasing. *(Correct – hands up)*

5. The death rate decreased over the past 200 years because of more frequent illness, civil unrest, and worse working conditions. *(Incorrect – hands down)*

6. The death rate decreased over the past 200 years because of advances in medicine, agriculture, sanitation, transportation, and nutrition. *(Correct – hands up)*

FOLLOW-UP ACTIVITIES

1. Provide students with birth and death rates for the six countries in the chart below. For each country, take the following steps with students working in pairs:

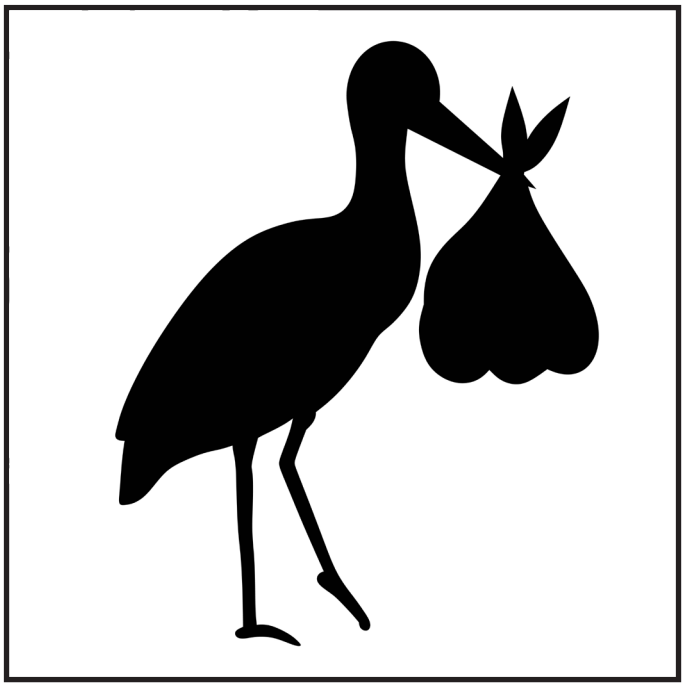
   - Ask one pair to come forward and find the country on a globe or map.
   - The pair should select the appropriate measuring cups to represent the birth and death rate of that country.
   - Students determine who will be the Stork and Grim Reaper, and conduct the demonstration.

Country	Birth Rate (2020)	Death Rate (2020)	Measuring Cups
Central African Republic	35/1,000	12/1,000	1 cup: 1/3 cup
Ecuador	17/1,000	4/1,000	1 cup: 1/4 cup
Nepal	21/1,000	7/1,000	1 cup: 1/3 cup
New Zealand	12/1,000	7/1,000	1 cup: 1/2 cup
Singapore	9/1,000	5/1,000	1 cup: 1/2 cup
Slovakia	10/1,000	10/1,000	1 cup: 1 cup

2. Challenge students to create their own model to demonstrate the global birth and death rates. Encourage them to think creatively and beyond moving a substance in and out of a bowl. They might, for example, have 19 students go to the front of the room, then have 7 students sit down and repeat the process. Or, they might measure out 19 inches of yarn, cut off 7 inches, then tie on another 19 inches and cut off 7 inches, repeating the process.

Data source: Population Reference Bureau.

THE STORK AND THE GRIM REAPER
NAME TAGS



Resource: National Geographic Kids

https://kids.nationalgeographic.com/

National Geographic Kids is known for its engaging, high-quality educational materials focused on geography, science, and world cultures, aimed at younger audiences. Reflecting on how I would utilize National Geographic Kids in my elementary social studies classroom, I see several opportunities to enrich my teaching and provide students with a vibrant, interactive learning experience. Firstly, the website's wealth of articles and stories about different countries, cultures, and historical events presents a fantastic opportunity to broaden my students' understanding of the world. I plan to incorporate these readings into my lessons as a way to introduce new topics or to provide deeper insights into subjects we're studying. The high-quality photographs and videos that accompany many of the articles would also serve as excellent visual aids, helping to capture my students' interest and imagination. Another valuable aspect of National Geographic Kids is its interactive games and quizzes. These resources can make learning about geography and cultures more engaging and fun for students. For example, a game that challenges students to locate countries on a map or quizzes that test their knowledge of world capitals can be excellent tools for reinforcing geographic literacy in an interactive way. I would use these games as part of classroom activities or as supplementary homework assignments to enhance students' learning experience. Moreover, the DIY projects and experiments featured on National Geographic Kids offer hands-on learning opportunities that are perfect for making social studies more tangible. Projects that explore environmental science concepts or cultural crafts from around the world could be integrated into my curriculum to support cross-curricular learning, allowing students to see the connections between social studies, science, and the arts. By incorporating resources from National Geographic Kids into my classroom, I also aim to inspire a sense of wonder and curiosity about the natural world and human cultures. Encouraging students to explore the diverse content available on the website can help foster a lifelong love of learning and exploration. This aligns with my goal of not only teaching social studies content but also nurturing informed, curious, and compassionate global citizens. In conclusion, National Geographic Kids offers a treasure trove of resources that I plan to utilize to enhance my social studies curriculum. Its articles, videos, games, and DIY projects provide diverse and engaging ways to explore geography, cultures, and science, making it an invaluable tool for enriching my students' learning experiences and broadening their understanding of the world.

FROG JUMPING IN SLOW MOTION

Frogs jump with amazing power and incredible distances in this slow-motion music video.

Moment of Fresh Water

Check out the issue!

PUZZLES

Puzzles: Habitats

Using images from animal and plant habitats, these games challenge you to complete pictures by putting the pieces in the right spot. Plus, get facts about oceans, rainforests, and more!

Resource: TVO Learn

https://tvolearn.com/?gad_source=1&gclid=Cj0KCQjw-r-vBhC-ARIsAGgUO2Dz0oNEs65lW3X0kKmFV5p4_4sQPX2cFoE0uuP4DePkOb7WOxUoKPcaAqzSEALw_wcB

After discovering TVO Learn as a resource for my classroom, I would anticipate using its educational materials to enrich my social studies curriculum. The platform seems to offer a diverse array of resources across various aspects of social studies, tailored to elementary students' learning levels and interests. I plan to use the videos available on TVO Learn to introduce and expand upon key social studies concepts. Visual content is particularly effective in engaging young learners and can provide context and clarity on topics that might be difficult to grasp through text alone. For example, a documentary-style video about the daily lives of children in historical times or different cultures could enhance students' understanding and curiosity about the world. The interactive activities and games provided by TVO Learn would be invaluable for reinforcing learning in a fun and engaging way. Interactive quizzes on geographical knowledge or simulation games that allow students to explore historical events from multiple perspectives can make abstract concepts more tangible and memorable. I would integrate these tools into lessons to encourage active participation and to cater to various learning styles. Furthermore, the lesson plans on TVO Learn would be a great resource for me. They would offer structured guidance on presenting complex social studies topics in an accessible manner, ensuring that I cover curriculum standards effectively while engaging my students. These plans often include suggestions for discussions, projects, and assessments, which I could adapt to fit my classroom's needs. Incorporating TVO Learn into my teaching practice would also present an excellent opportunity to highlight the importance of media literacy. Navigating the platform and critically engaging with its content would help students develop valuable skills in assessing and utilizing digital resources for learning. This aligns with my goal of preparing my students not only to understand the world around them but also to interact responsibly and effectively with digital media. In summary, TVO Learn appears to be a rich and versatile educational resource that I am eager to explore further. I anticipate that its video content, interactive activities, and lesson plans will significantly enhance my social studies instruction, making learning more engaging and effective for my students while supporting their development of critical digital literacy skills.

Learning Resources You Can Count On

Welcome to TVO Learn, an effective way to help your child explore learning that aligns with the Ontario curriculum, from Kindergarten to Grade 12.

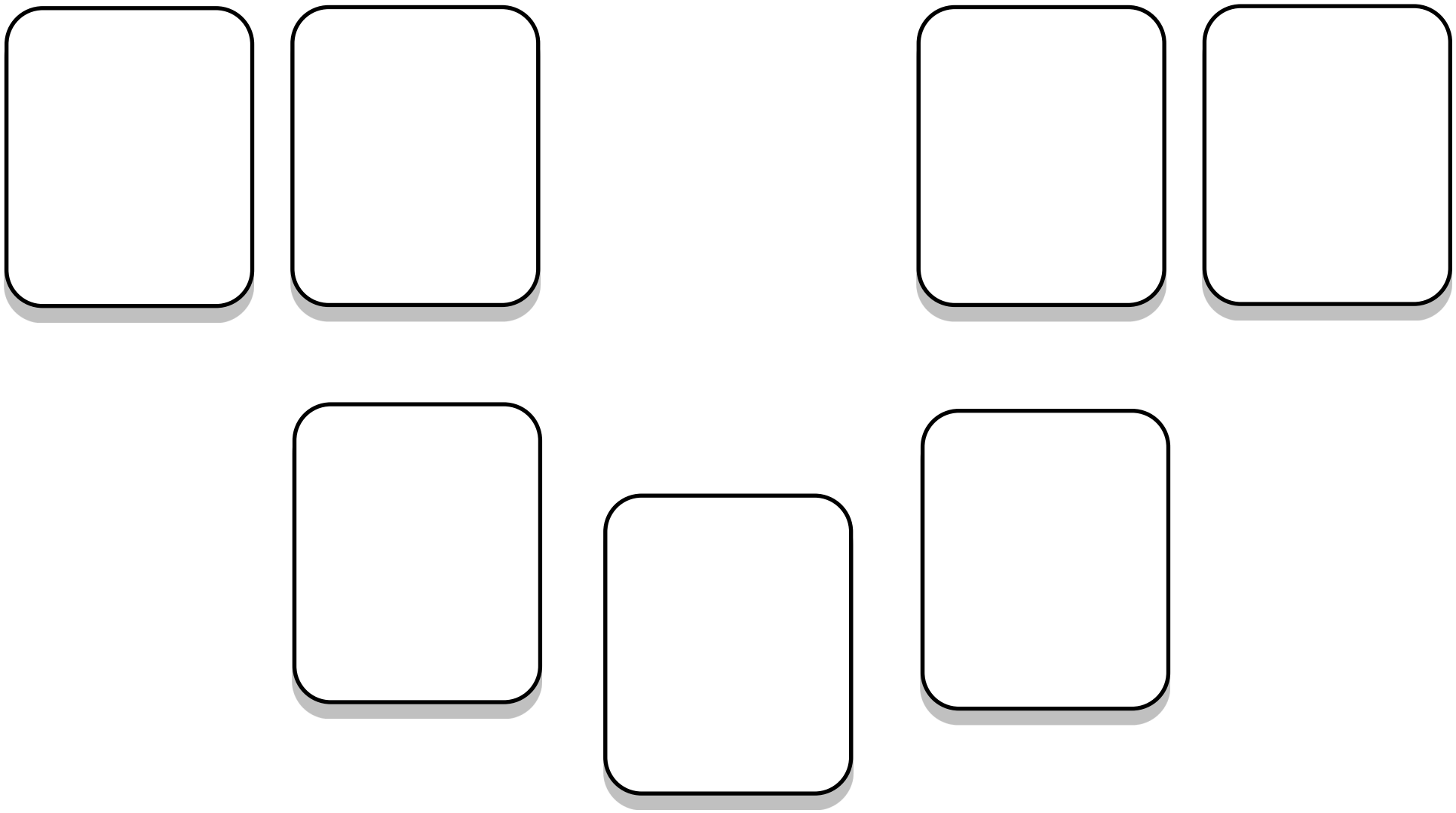
Explore straightforward, engaging and free resources you can trust to support your child's learning.

Text

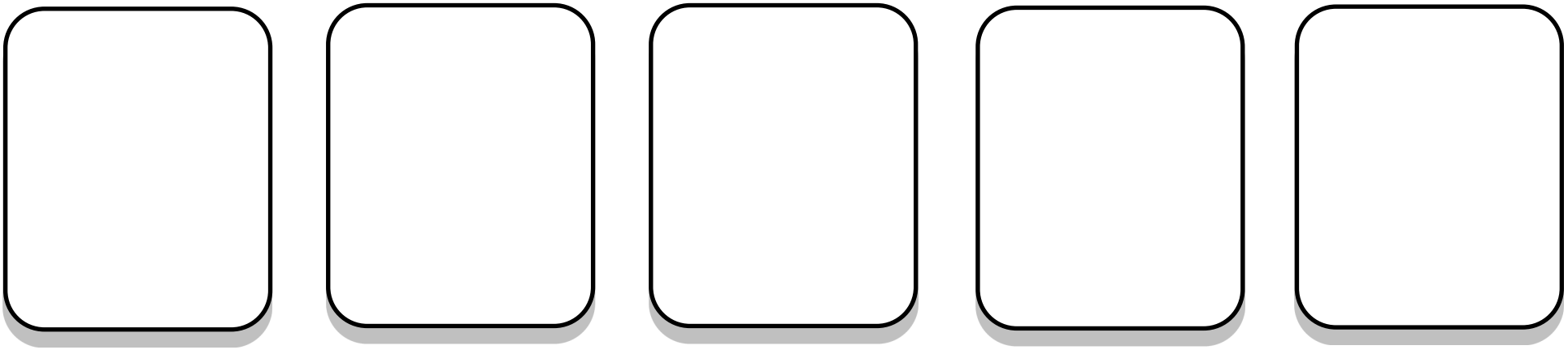
My Family

Why is your family important to you?

Family Tree



Family Tree



Me

Resource: Canadian Museum of History Teacher's Zone

https://www.historymuseum.ca/teachers-zone/

Exploring the Canadian Museum of History Teachers' Zone, I've identified several ways this resource could be invaluable in my classroom. Firstly, the lesson plans available on the platform are comprehensive and align well with curriculum standards. They cover a broad range of Canadian social studies topics, offering me a solid framework to develop my lessons. I would use these plans to introduce new topics, ensuring that my students receive a well-rounded understanding of Canada's past, from Indigenous histories to contemporary events. The virtual exhibitions provided by the Teachers' Zone are particularly appealing for their interactive and immersive nature. I would integrate these digital resources into my teaching to bring historical periods and events to life for my students. For example, a virtual tour of an exhibit on the fur trade or Indigenous art could serve as a dynamic supplement to textbook readings, engaging students visually and contextually. Additionally, the variety of suggested activities encourages critical thinking and active engagement with social studies. Projects like creating timelines, designing museum exhibits, or participating in role-play exercises based on historical figures or events would be integrated into my classroom to cater to diverse learning styles. These hands-on, creative activities are excellent for reinforcing content knowledge and fostering a deeper connection with historical subjects. By incorporating resources from the Teachers' Zone into my teaching strategy, I would also aim to highlight the role of museums and historical preservation in our society. It would be a wonderful opportunity to discuss with my students the importance of studying history and how it helps us understand the present and can influence the future. This aspect would be woven into discussions and projects, encouraging students to see themselves as part of a larger historical narrative. In summary, the Canadian Museum of History Teachers' Zone offers a rich array of resources that I plan to use to enhance the teaching and learning of Canadian social studies in my classroom. Its lesson plans, virtual exhibitions, and interactive activities are tools I would leverage to make history education more engaging and meaningful for my students, while also instilling in them an appreciation for historical study and museum-based learning.

What is the Canadian Museum of History Teachers' Zone?

This website was created to provide Canadian teachers — primarily Grades 3–12 — with access to primary sources and high-quality content. We have worked closely with topic experts, members of diverse cultural communities, and teachers from across the country to create teaching resources on a variety of history-based topics.

In the Teachers' Zone you'll find curriculum-based themed packages that include museum artifacts, archival documents, audio and video content, as well as activity suggestions.

Please check back often, as we will continue to enrich these packages and develop new ones, while also reflecting the latest in scholarship, learning, and ways of teaching.

The Canadian Museum of History Teachers' Zone is designed to bring Canadian history into your classroom in a dynamic and engaging way!

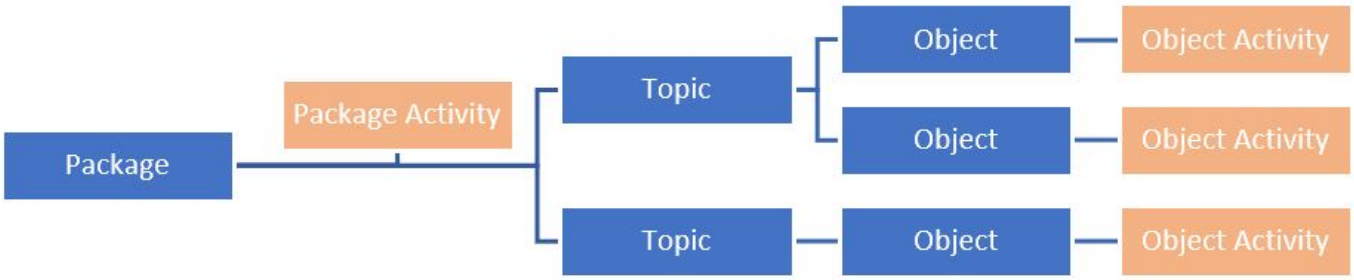
Who is the Teachers' Zone for?

This website is for anyone who wants to use primary source material effectively within a classroom setting.

Our primary audience is educators across Canada who teach history or social studies from Grades 3–12 (Cycle 2 to Secondary V in Quebec).

How is everything organized?

The website is made up of packages that are organized like this:



You can search the Teachers' Zone for full packages or for individual objects.

Packages

Packages contain digitized museum artifacts, archival documents, video and audio clips and activity suggestions for your class. Each package has its own theme; that theme is broken up into topics, which lead to individual objects.

Objects

Objects are the key elements in each package. Objects may include digitized museum artifacts, archival documents, and video and audio clips.

Package Activities

Package activities are project-based activities designed to take one or more classes. These activities involve the use of historical thinking concepts while exploring the whole package, resulting in a more comprehensive approach. Find package activities by clicking the Activities tab once you're in a package.

Object Activities

Object activities are short inquiry-based activities that typically take 5–25 minutes. These activities encourage students to think critically about the objects being presented, and to use historical thinking concepts. There are three different types of object activities: Look, Think, and Do. Find object activities below each object.

Does this content reflect my curriculum?

Yes! Since each province and territory has its own unique curriculum, we have taken common themes from across the country and used them as guides for the packages we

have created.

Although you will not see a label indicating a specific grade or curriculum associated with a given package, you will be able to search packages by topic, theme and date range.

We have also incorporated cross-curricular learning in our activity suggestions where appropriate.

Is everything accessible?

We know that everyone accesses information differently, and have tried to ensure that package content addresses the varied needs of students and educators.

Some of the many ways in which these packages support accessibility:

- Three levels of historical context to accommodate different ways of learning.
- A variety of media, including audio and video content, for diverse learning abilities.
- Multiple activity suggestions for diverse learning abilities.
- Content can be read with Assistive Technology applications.
- Downloadable and printable content that can be accessed offline.
- Transcripts for video, audio and hard-to read archival documents.
- Video subtitles in both official languages.
- Content is available in both official languages.
- Website complies with Website Content Accessibility 2.0 AA Guidelines.

It is important to us that this website is accessible for anyone wishing to use it. If you have suggestions for improvement, please contact us.

Who creates the content?

For packages authored by the Canadian Museum of History, content was assembled by the Museum's educational experts, or Learning Specialists. These Learning Specialists work closely with curators, subject experts, and members of diverse cultural communities to ensure that the information provided is accurate.

The activities were created by Learning Specialists and informed by our National Teacher Advisory group.

How can I use Package and Objects in my classroom?

However you like! We have tried to make our content as relevant as possible, but you know what works in your classroom better than anyone.

A few options:

- Use package content to prepare for a class module or course of study.
- Individual objects can be shared with the whole class on a Smartboard or projector.
- Students can explore the website and complete activities on their own.
- Teachers can print out images of objects, and complete object activities with the entire class.

We have included a number of activity suggestions with each package and object to get you started.

Can I send my students to the Teachers' Zone?

Absolutely! We recommend taking a look around first, to become more familiar with the package, object or activity you'd like your students to explore.

Most text is directed towards informing teachers, but we have three levels of historical context for each object, allowing better access for students.

Why isn't there a package on the subject I'm teaching?

As of 2020, this website launched with two themed packages. We will continually add new packages in the years after.

If you have a suggestion for a package, please let us know!

What is a featured Package?

At the top of the Home page, we will feature a package that is new or especially relevant. You can always find our other packages by scrolling down on the Home page.

Why do some Objects have "Sensitive Content" or "Offensive Language" labels on them?

We know that history isn't always easy or kind and wanted to be sure we flagged content that some might find upsetting or shocking.

While it is important to celebrate the many individual and collective achievements in Canadian History, we also wanted to candidly address some of the conflicts and controversies from this country's past, revealing the diverse experiences and perspectives of the real people who lived and experienced it. We feel it is important that we don't censor this content; it is important to learn about the past, so we can be better informed for the future.

Please note that some historical sources found in our collections use language and terminology that reflects the context and culture of the time of their creation. This language does not reflect the views of the Canadian Museum of History in 2020. However, as part of the historical record, the Museum chooses not to censor or alter these sources, in the interest of presenting an honest reflection of the past. For more information, please contact information@historymuseum.ca.

We hope that, by our flagging this content, you will feel better informed about the content you bring into your classroom. Our National Teacher Advisory has come up with a list of things to consider when exploring difficult subject matter with your students: Teaching Difficult History.

What is the difference between Package Activities and Object Activities? Where can I find them?

Package activities are project-based activities designed to take one or more classes. These activities involve the use of historical thinking concepts while exploring the whole package, resulting in a more comprehensive approach. Find package activities by clicking the Activities tab once you're in a package.

Object activities are short inquiry-based activities that typically take 5–25 minutes. These activities encourage students to think critically about objects being presented, and to use historical thinking concepts. There are three different types of object activities: Look, Think, and Do. Find object activities below each object.

I can’t see or download content. Is there a way to get “hard copies” of Packages?

Yes! Please send us an email, letting us know which package(s) you want. We will mail you a USB stick containing all the content and media associated with the package(s) you’ve requested.

What is the Canadian Museum of History?

Located on the traditional unceded territory of the Algonquin Anishinabeg in Gatineau, Quebec, the Canadian Museum of History welcomes more than 1.2 million visitors each year to its celebrated complex.

With roots stretching back to 1856, it is one of Canada’s oldest public institutions and a respected centre of museological excellence, sharing its expertise in education, history, archaeology, ethnology and cultural studies both within Canada and abroad.

For more information, please visit our main website.

Activities

There are two types of activities: Package Activities and Object Activities.

Package Activities are project-based activities designed to accommodate one or more classes. These activities involve the use of historical thinking concepts while exploring the whole package, resulting in a more comprehensive experience.

Object Activities are short inquiry-based activities that typically take 5–25 minutes. These activities encourage students to think critically about the objects being presented, and to use historical thinking concepts.

Both types of activities were created with the guidance of educators from across Canada, and incorporate current educational theory and approaches.

PACKAGE ACTIVITIES

Explore project-based Package Activities by scrolling down.

Gender and Equality Rights Timeline Activity

Starting with the 1969 *Omnibus Bill*, create a timeline of Canadian legislation — at both the provincial and federal levels — that has had an impact on 2SLGBTQIA+ rights in Canada. Share your timeline with your classmates and discuss how the bills you've chosen protected and/or continue to infringe on the rights of 2SLGBTQIA+ people in Canada.

OBJECT ACTIVITIES

Explore inquiry-based Object Activities by clicking on individual objects below.

Identity and Belonging

3 OBJECTS

VIDEO

Understanding and Acceptance

Difficult Content

VIDEO

Niish Manidoowag (Two-Spirited Beings)

Difficult Content

ARTIFACT

North York Aeros jersey worn by Angela James

Community and Protest: The Origins of Pride in Canada

5 OBJECTS

VIDEO

Celebration as Protest: The Origins of Pride

DOCUMENT

Counter-protest flyer following arrests at Truxx in October 1977

PHOTOGRAPH

Toronto Bathhouse Raids

ARTIFACT

Carroll Holland Pride Pin

PHOTOGRAPH

Black Lives Matter Toronto Sit-In

Grassroots Leadership

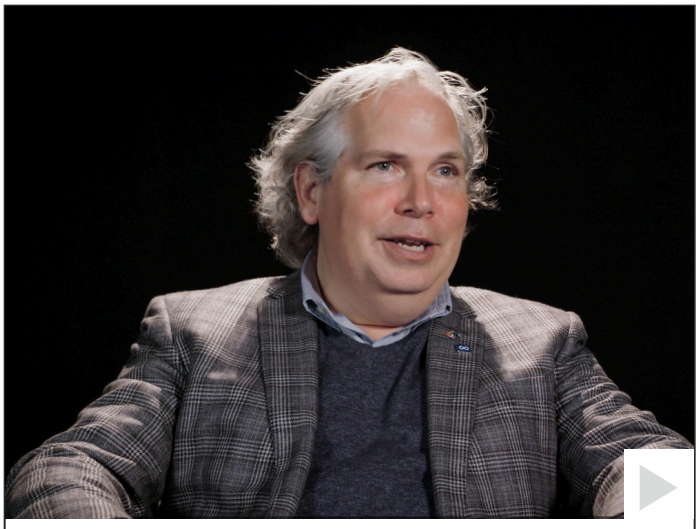
3 OBJECTS

ARTIFACT

The Gay Sweater

VIDEO

Travis Price: Day of Pink

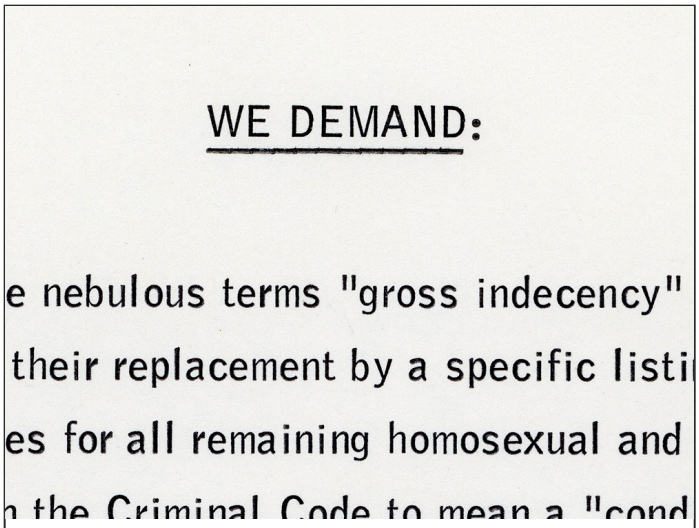


VIDEO

From Soldier to Plaintiff

Decriminalization

5 OBJECTS



DOCUMENT

Demands Presented to the Federal Government from the Gay Action Committee

PHOTOGRAPH

Pierre Trudeau Speaking Outside the House of Commons on December 21, 1967

PHOTOGRAPH

Prime Minister Justin Trudeau Issues Apology on by the Federal Government on November 28, 2017

VIDEO

The "LGBT Purge" and the Canadian Military

VIDEO

Decriminalizing Sexuality: Legacy and Limitation

Expanding Equality

4 OBJECTS

PHOTOGRAPH

The Charter and the Vriend Case

ARTIFACT

Section of Pride Rainbow Project Banner

PHOTOGRAPH

Harriette Cunningham and Tru Wilson

VIDEO

Gender Expression on Parliament Hill

Resource: PBS Learning Media

https://www.pbslearningmedia.org/subjects/social-studies/elementary-social-studies/?rank_by=recency

Exploring PBS Learning Media for Elementary Social Studies has offered me a broad spectrum of resources that I see as highly beneficial for my classroom. This platform provides a wealth of digital content including videos, interactive tools, and lesson plans that cater specifically to elementary-aged students. The resources are designed to make social studies more engaging and accessible, covering a wide range of topics from community roles to world cultures and historical events. One of the standout features of PBS Learning Media is its collection of videos. I plan to use these visual resources to introduce new topics or to deepen understanding of complex subjects. Videos have the power to capture my students' attention and can often present information in a more relatable and memorable way than traditional textbooks. For instance, a video on the daily life of children in different parts of the world would provide a tangible and engaging way for my students to learn about global cultures and empathy. The interactive tools and games available on PBS Learning Media are another aspect I find particularly compelling. These resources can make learning about social studies more interactive and fun, which is crucial for young learners. For example, an interactive map exploring the geography of the United States or a game that teaches about the responsibilities of community workers could be integrated into my lessons to reinforce learning objectives in a hands-on manner. Additionally, the lesson plans provided on the site are a valuable tool for ensuring that my teaching aligns with educational standards while remaining engaging and innovative. These plans often include a variety of activities and assessment ideas, which I would adapt to suit the needs and interests of my students. The lesson plans are also a great way to discover new teaching strategies and resources that I might not have considered otherwise. By incorporating PBS Learning Media resources into my classroom, I also see an opportunity to foster digital literacy among my students. Navigating the platform and engaging with its digital content can help students develop skills in researching and processing information in digital formats, which are essential skills in today's world. In conclusion, PBS Learning Media for Elementary Social Studies presents a comprehensive and versatile set of tools that I am eager to utilize in my teaching. The videos, interactive tools, and lesson plans will not only help me make social studies more engaging for my students but will also support me in meeting diverse learning needs and objectives. This resource stands out as a dynamic supplement to traditional teaching methods, offering creative ways to explore social studies topics while also building important digital literacy skills.

Elementary Social Studies

Discover exciting resources and methods for teaching social studies to students from pre-kindergarten through fifth grade in Elementary Social Studies. Students can practice making inferences as they explore animal shelters, research using the Great States series, or complete a graphic organizer to compare holidays with the All About the Holidays series. Topics ranging from the leadership of Abraham Lincoln to Neil Armstrong's first mission to the moon are covered in Elementary Social Studies.

Featured Elementary Social Studies Collections

Collection 10

City Island

Collection 12

Rosie's Rules

Elementary Social Studies Topics

The Great Plate Mystery! (Native American Dishes) | The Plate Show Podcast

Audio Grades: K-2, 3-5 Collection: **The Plate Show Podcast**

Transcript Download

About Standards

Spoonie LOVES corn, so is so excited for an episode about Native American cuisine! She and Tongs can't wait to try corn mush for today's episode...but uh oh, their trusty kitchen plate is missing! Working together with their kitchen utensils, Detective Spoonie must follow the clues to find the plate in time for the Big Taste. Special guest Kevin Maillard shares stories about food that's meaningful to him and

his family as a member of the Seminole Nation of Oklahoma, and kid guest Watehronhine will share about the food and traditions that are important to her and her Mohawk Native American community.

More About This Resource

Live from the kitchen...it's The Plate Show! ***The Plate Show*** is a comedy podcast for kids ages 6-9 and their families about cultures around the world and the foods that are important to them.

Join Spoonie, everyone's favorite talking spoon, and her BFF sidekick Tongs, as they put on a show from their very own kitchen to learn about—and taste—amazing food from around the world! In each episode, listeners will meet awesome kids and celebrity guest chefs who talk to Spoonie about their own cultural traditions and the food they love. Plus, each episode has an interactive game, a recipe to try at home...and a bunch of silly jokes.

Through the stories shared directly from special guests, and Spoonie's experiences in the kitchen, listeners will learn important lessons about cultural competency as well as critical life skills like impulse control, focused attention, and collaboration.

Permitted use
Stream, Download and Share

Accessibility
Transcript

Credits

Next: Standards →

Support Materials for Teachers

USING THIS RESOURCE

Teaching Tips | The Plate Show Podcast

Resource: Canadian Geographic Education

https://cangeoeducation.ca/en/

This website provides resources that focus on geography, environmental science, and the diverse cultures within Canada. To use it in my classroom, I would delve into Canadian Geographic Education's extensive collection of maps and geographic information. Utilizing these resources, I plan to create interactive lessons that explore Canada's physical landscapes, climate, biodiversity, and human geography. For example, a lesson centered on the diverse ecosystems found across Canada could include an interactive map activity where students identify and research various regions, such as the Arctic tundra, the Great Lakes, and the coastal rainforests. This would not only enhance geographic literacy but also foster an appreciation for Canada's natural diversity. Additionally, Canadian Geographic Education offers lesson plans and classroom activities designed to align with the Canadian social studies curriculum. I would use these lesson plans as a foundation for my teaching, adapting them to suit the needs and interests of my students. Whether it's exploring the history and culture of Indigenous peoples, understanding Canada's role in global affairs, or learning about conservation efforts, these resources would provide a structured and comprehensive approach to teaching complex topics. The website also features articles, photographs, and videos that bring Canadian and world geography to life. I plan to incorporate these multimedia resources into my lessons to stimulate discussion, provoke questions, and inspire curiosity among my students. In summary, Canadian Geographic Education appears to be a resource-rich platform that I am eager to explore and incorporate into my classroom. Its maps, lesson plans, multimedia content, and projects present diverse and engaging ways to teach about geography, culture, and environmental science, enriching my students' learning experiences and fostering a deeper appreciation for Canada and its place in the world.

Educator Resources

Canadian Geographic Education offers free, bilingual resources for grades K to 12 on a variety of topics. Whether you're looking for outdoor learning activities, lesson plans on citizen science, an immersive online tool to teach about climate change, or simply a map to practise map-reading skills—we have all that and more! In the filters below you can choose a resource type, topic, and grade level and click "Apply" or search our resources by keyword.

Giant Floor Maps ›

Check out our Giant Floor Maps for hands-on learning and inquiry-based exploration!

Search resources by keyword...

Resource type

Topic

Grade

FILTER CLEAR

APPLY

128 Educator resources found

The importance of native plants across Canada interactive infographic

Interactives | Infographics | Nature & Wildlife | grades 4-12

Canada's ocean, freshwater, and us interactive map

Maps & Activities | Interactives | Climate Change & Environment | Regional Geography | Physical Geography | Nature & Wildlife | Energy & Natural Resources | grades 4-12

Geography entertainment – Video game recommendations

Maps & Activities | Climate Change & Environment | Energy & Natural Resources | Development & Sustainability | Geographic Skills | History | Nature & Wildlife | Science & Technology | Politics & Economics | Society & Culture | Physical Geography | grades 4-12

Arctic Arts and Culture Lesson Plans

Lesson Plans | Society & Culture | grades 6-12

The Great Canadian Electricity Map

Giant Floor Maps | Climate Change & Environment | Development & Sustainability | Energy & Natural Resources | Science & Technology | grades 4-12

Commemorate Canada – John McCrae

Lesson Plans | History | Society & Culture | grades 4-12

Sustainable cities: Green spaces for people and wildlife

Infographics | Climate Change & Environment | Development & Sustainability | Society & Culture | Nature & Wildlife | grades 6-12

Coronation of King Charles III — Overview

Lesson Plans | Infographics | Interactives | History | Development & Sustainability | Society & Culture | Climate Change & Environment | grades 6-12

Skip to content

#ExploreCan — The beauty in the natural world StoryMap

Interactives | Nature & Wildlife | Society & Culture | Climate Change & Environment | grades 5-12

#ExploreCan — Deep ocean exploration StoryMap

Interactives | Nature & Wildlife | Science & Technology | Physical Geography | grades 6-12

See 10 of 118 more

Skip to content

Exploring Arctic arts and cultures in relation to activism

Grade level

Grades 6-12

Time required

3-4 class periods (can be adapted)

Subjects

Arctic arts and cultures, Social studies, Health and wellness, History, Indigenous studies, Geography, Science

Learning objectives

- Students will gain an understanding of the importance of art activism and how it can affect real change in Canada and the world.
- Students will identify and discuss the differences and similarities between the Arctic and Canada's southern regions in terms of the impacts of climate change currently being recorded in both regions.

Activity summary

- Students will discuss art activism, in particular how circumpolar collaboration brings Arctic communities together to tackle issues such as climate change through arts and culture.
- Students will explore and research examples of art activism and discuss the uniqueness of Indigenous Knowledge and art.
- Students will create their own art projects, inspired by what they have learned and focusing on their own communities.

Materials needed

- Device with Internet access for research
- Copies of the Art Activism worksheet to hand out
- Art supplies, such as pens, coloured pencils, and markers
- Electronic or printed copies of the Arctic Map card

Overview

The arts provide a way for people to express themselves creatively and share ideas and stories. Art can help overcome differences, break down barriers, connect us to the past, and provide a means of understanding ways of life and environments as they were in pre-colonial times. It can also be used to share experiences unique to a certain region, such as the Arctic, as well as to reassert the need to address the ongoing climate crisis. In this lesson, students will learn about activism topics relevant to the Arctic and will explore how art can play a meaningful role in activism. Students will discuss climate change, its effects on the Arctic, and how residents of the Arctic use art to express their views on climate-related issues.

The Arctic

The Arctic Circle is defined as the latitude line of 66.33 degrees. It's the southernmost latitude at which the sun remains either above the horizon for 24 hours during the summer solstice or below the horizon for 24 hours during the winter solstice. The Arctic region, defined by the Arctic Council (an intergovernmental forum for Arctic governments and peoples), includes the northern territory of eight countries encircling the Arctic Ocean: the United States, Canada, Denmark, Russia, Iceland, Sweden, Norway, and Finland.

Indigenous Peoples often define the Arctic differently than simply a latitudinal or geographic boundary. The Arctic can be defined based on First Nations and Inuit histories, the geographic distribution of Indigenous languages that are (or were once) spoken across the region, as well as the cultures and oral traditions of those Indigenous groups.

Arctic arts and culture is integral to northern identity, as well as to the past, present, and future of the North. They have been often overlooked or oversimplified. Learning about Arctic arts and cultures allow us to learn about the North, to gain a more nuanced understanding of the Arctic and its peoples, and to better understand the intersection of identities, histories, systems and environments at play in the Arctic.

Lesson Implementation

Minds on

Begin the activity with a discussion to get students thinking about how art is used to communicate ideas and feelings.

As a class, brainstorm a definition for "art activism." Have students suggest ideas related to the topic and create a word cloud around the concept of art activism. Guide students using the following questions:

- What do you consider art? What are some examples of art forms (e.g., visual, culinary, traditional, performance, fashion, written or spoken, digital and media)?
- What role does art play in society? How does art influence us? What factors influence or inform the art that we create?
- What is activism? What are some examples of activism (e.g., boycotting, writing letters, attending rallies, sit-ins, graffiti)? What impact can activism have?
- How can art be used in activism? How can art affect change? Why might we use art as a form of activism instead of other forms of activism?

Exploring Arctic arts and cultures in relation to activism

Acknowledgements

This project was made possible through a collaboration between Canadian Geographic Education, CCUNESCO and the Canada Council for the Arts.

Next, focus the class discussion on Canada's Arctic region. Arctic communities in Canada have developed a range of cultural traditions and art forms that are unique to their geography and reflect issues and topics that are important to them. These issues and topics might be different from those of communities in Canada's southern regions. Similarly, inland communities might have different values and concerns than coastal communities. However, Arctic communities in Canada share certain similarities with communities in circumpolar regions around the world. Guide students in discussing circumpolar collaboration, using the following questions:

- What might communities in Canada's North have in common with communities in circumpolar regions of other countries?
- Why might collaboration among circumpolar communities be important for activism? How might it be challenging? How is this collaboration unique or how might it differ from collaboration with other regions?
- What are some issues that are important to Arctic communities? (Use the Arctic Map card to help students understand the geographical boundaries of the Arctic region.)

Action

Explain to students that they are going to further explore the connection between art and activism, particularly looking at how art can be used as a vehicle for change. Guide students to the website for the Arctic Arts Summit, which brings together representatives of Arctic countries and Indigenous nations in the circumpolar region to celebrate and strengthen arts and culture in these communities. Provide students with time to explore the website, focusing in particular on the Engage section. Using the filtering system, encourage students to read articles on themes of activism and circumpolar collaboration.

In the North, climate change is happening at a rate of more than double the rest of the world, making it a pressing concern for many Arctic communities. Have students break into small groups to research an example of art activism linked to the issue of climate change. Encourage students to find Arctic examples in the Engage section of the Arctic Arts Summit website. Options can include but are not limited to:

- How Nunatsiavut Artists Use Their Work to Fight Climate Change
- The Far North Photo Festival
- Tether Exhibition Youth Gallery
- Listening for Sedna
- Brian Adams: Connecting with Inuit culture and community through photography

Allow time for students to go beyond the Arctic Arts Summit website to research the artists or organizations involved in their project. Hand out the Artistic Activism worksheet and encourage students to use the questions as a guide for their research.

Once students have completed their research, bring them together for a class discussion. Have each group share their projects with their classmates and what they learned. If possible, ask groups to share examples/samples of the art they researched. Did students arrive at any similar conclusions about art activism?

Exploring Arctic arts and cultures in relation to activism

Facilitate a discussion focused on the importance and power of activism and art. Consider the following questions:

- How does art influence us? How can it affect change?
- What role does art have in promoting collaboration (circumpolar or otherwise)? Consider the distinction between using art and creativity for activism, and situations in which simply engaging in artistic or cultural practices is activism.

Conclusion

Conclude the activity, by asking students to create their own art, inspired by what they have learned. Encourage them to think about the themes of the lesson plan (i.e., collaboration and art activism) and to consider the unique perspectives found in Arctic arts and culture. Explain to students that they will now apply this learning to their personal experiences and local geography using their own artistic approach.

Have students explore the effects of climate change in their own community and what similarities and differences they experience at home in comparison to the Arctic. Have students predict how things will change in their community in the next 50 or 100 years. Ask them to choose an art form (e.g., visual art, prose, poetry, music, dance) and create an activism piece about these changes.

Students can work individually or in groups and must provide an artist statement about their work. In their statement, they should explain their artistic choices, their overall intent or message that they wanted to convey, as well as why the issue of climate change is important to address for the wellbeing of their community.

If possible, consider inviting a local or Northern art activist and/or Indigenous artist to participate in this activity and the students' work in detail.

Extend your geographical thinking

- Students can research examples of Arctic art activism, online or in magazines, and can identify into which categories these examples fit, such as boycotting, letter writing, rallying, or educating. This can aid in the understanding of different kinds of activism and can help guide discussion.
- Students can research examples of Arctic art activism related to other topics, such as biodiversity loss, food insecurity, or pollution. They can choose an art form (e.g., visual, culinary, traditional, performance, fashion, written or spoken, digital and media) and create an activism piece about one of these topics.
- Students can profile an Indigenous creator, similar to the Arctic Arts Summit articles they read earlier. Direct students to read the blog 10 Indigenous Activists and Artists You Should Be Following Right Now from *Global Citizen*. Choosing one of those individuals, students can pretend they are a journalist covering this individual's work (students can also choose to research an individual not on that list). Have students write an article, create a video, lay out a magazine feature, or produce a radio piece about this individual and their work. Encourage them to draw connections between art, activism, and the importance of Indigenous perspectives.
- Have students research different activists in the Canadian Arctic, in other Arctic regions in the world, or in their own community. Are there individuals or groups that are actively fighting to bring about political or social change on issues with

Exploring Arctic arts and cultures in relation to activism

which they feel a connection? Who are they and what are they fighting for? Reach out to an organization to learn about how your class can get involved.

- Invite one or more art activists or artistic leaders OR invite one or more Indigenous Elders, Knowledge Keepers, or leaders from the local territory to discuss how art and activism are connected in their work or their community (with preference to engaging those in or with connections to the Arctic). Have students prepare questions ahead of time to ask them. Use this experience to learn more about art activism. *Note: Remember to follow respectful protocol when inviting Indigenous Elders or community members to share their knowledge. This can be done virtually to facilitate interactions with individuals living in the Arctic or in remote communities. See the Connected North program as an example.*

Additional resources

Arts

- Arctic Arts Summit: Spotlights From Across the Circumpolar North
- Inuit Art Quarterly - Inuit Art Entertainment for Kids
- Inuit Cultural Online Resource
- Northwest Territories Arts
- Indigenous Yukon
- Inuit Futures
- Arctic Arts Project
- Travel Nunavut - Regions and Communities

Indigenous education

- Canadian Geographic Education: Indigenous Resources
- Indigenous Peoples Atlas of Canada
- The Canadian Encyclopedia - Inuit
- The Canadian Encyclopedia - First Nations in the Northwest Territories
- Oceans North
- Original Place Names in Arctic lands StoryMap
- Polar Knowledge Canada Giant Floor Map
- Arctic Alive Giant Floor Map

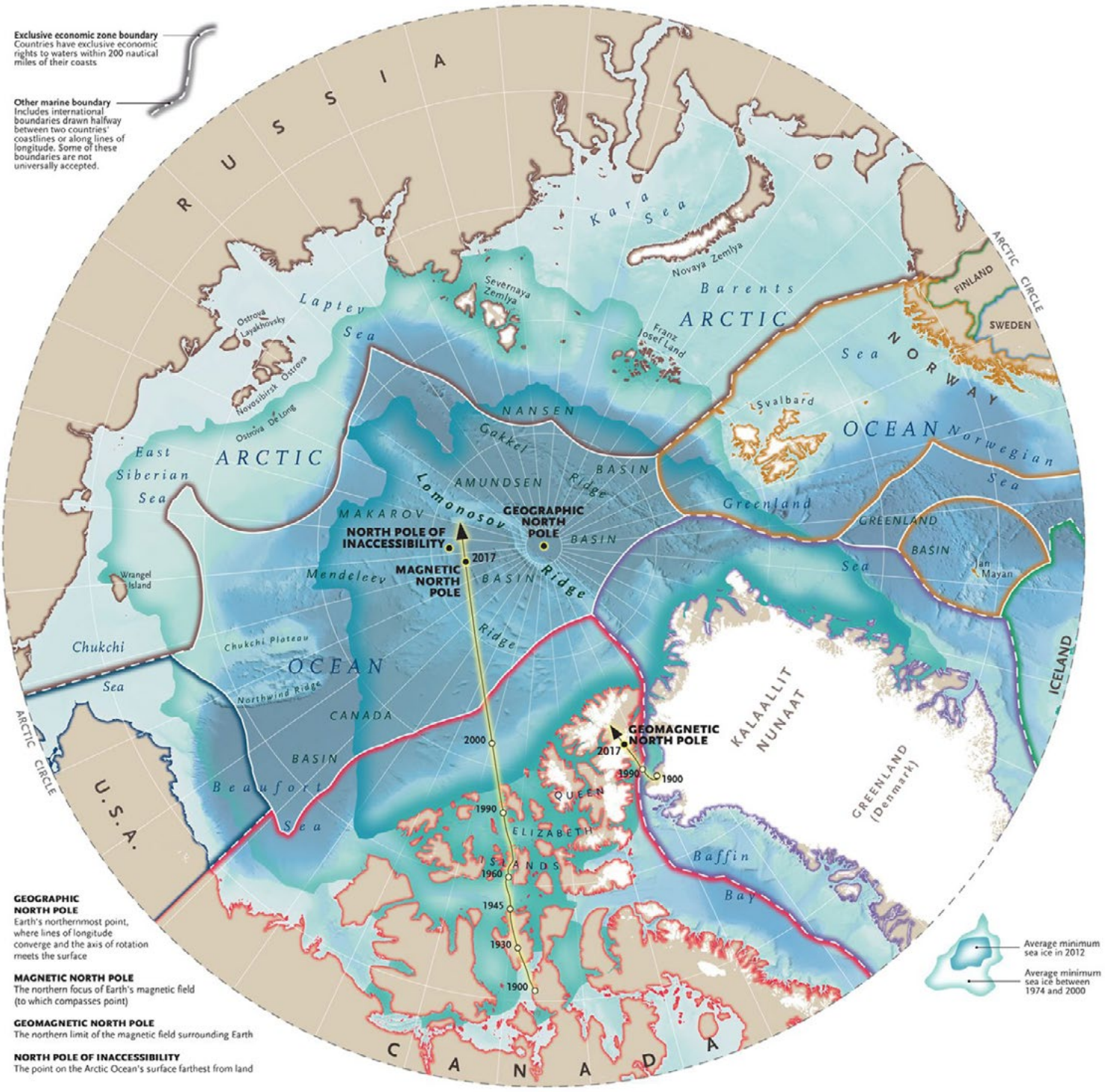
Government/Councils

- Crown-Indigenous Relations and Northern Affairs Canada - Northern Affairs
- Arctic Council
- Arctic Council – Indigenous Peoples Secretariat
- Government of Yukon - Find out about Yukon First Nations
- United Nations - Climate Change in the Arctic: An Inuit Reality

Articles

- Canadian Geographic - Lisa Koperqualuk on fighting for an Arctic Future

Exploring Arctic arts and cultures in relation to activism



Brackley/Canadian Geographic

Exploring Arctic arts and cultures in relation to activism

Art Activism

Describe the art project.

Who created this project? How does their identity inform their art? How does their environment (i.e., where they're from) influence their art?

How does this project reflect the realities of climate change in the North?

What values and priorities are expressed in the project? How are these values or priorities unique to Arctic communities?

How does the art in this project serve as a form of activism? What does it aim to achieve (i.e., the goal)? How does it benefit Canada and the world?

Has this project taught you something new about Arctic cultures or climate change? How has this research changed your perspective on what form activism can take?

ASSESSMENT TOOLS

VISUAL THINKING ROUTINES

SEE – THINK – WONDER

I SEE	I THINK	I WONDER

VISUAL THINKING ROUTINES

ZOOM IN

Observe the revealed image.

What do you observe?	What is your hypothesis or interpretation?

Keep on observing…

What new things do you see?	How might this change your hypothesis or interpretation?

What new things are you wondering about?

VISUAL THINKING ROUTINES

THINK – PUZZLE – EXPLORE

What do you think you know about this topic?	What questions do you have about this topic?	How might you explore the puzzles you have around this topic?

VISUAL THINKING ROUTINES

CHALK TALK

What ideas come to mind when you consider this idea, question, or problem?	What connections can you make to others' responses?	What questions arise as you think about the ideas and consider the responses and comments of others?

VISUAL THINKING ROUTINES

3-2-1 BRIDGE

Thinking about _____, identify:

INITIAL RESPONSE			NEW RESPONSE		
3 Words			**3 Words**		
2 Questions			**2 Questions**		
1 Analogy/Simile			**1 Analogy/Simile**		

BRIDGE

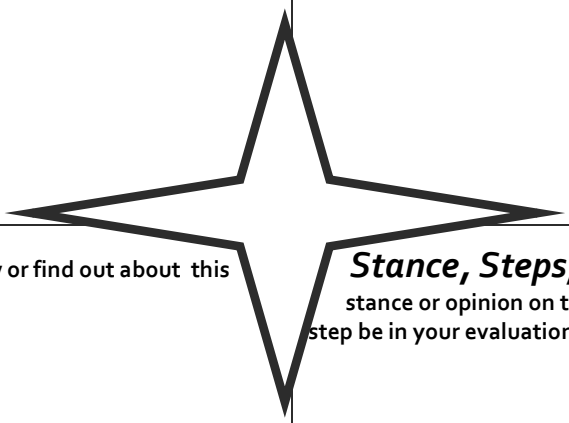
Identify how your new responses connect to or shifted from your initial response.

VISUAL THINKING ROUTINES

COMPASS POINTS

Excitement. **What excites you about this idea?**

Worries. **What do you find worrisome about this idea or proposition?**



Needs. **What else do you need to know or find out about this idea or proposition?**

Stance, Steps, or Suggestions. **What is your current stance or opinion on the idea or proposition? What should your next step be in your evaluation of this idea or proposition? What suggestions do you have at this point?**

VISUAL THINKING ROUTINES

EXPLANATION GAME

Name it. **Name a feature or aspect of the object that you notice.**	***Explain it.*** **What could it be? What role or function might it serve? Why it be there?**
Give reasons. **What makes you say that? Or why do you think it happened that way?**	***Generate alternatives.*** **What else could it be? And what makes you say that?**

VISUAL THINKING ROUTINES

HEADLINES

Use to space provided to write a headline for this topic or issue that summarizes and captures a key aspect that you feel is significant and important.

VISUAL THINKING ROUTINES

COLOR – SYMBOL – IMAGE

Think of: _____

COLOR	SYMBOL	IMAGE
Choose a **color** that you think best represents the essence of the main idea.	Choose a **symbol** that you think best represents the essence of the main idea.	Sketch an **image** that captures the essence of the main idea.

VISUAL THINKING ROUTINES

GENERATE – SORT – CONNECT - ELABORATE

Generate a list of ideas that come to mind when you think about this topic.

Sort your ideas according to how central or tangential they are. Place central ideas near the center and more tangential ideas toward the outside of the page.

Connect your ideas by drawing connecting lines between the ideas that have something in common.

Elaborate on any of the ideas or thoughts you have written so fay by adding new ideas that expand, extend, or add to your initial ideas.

ROLE OF MANIPULATIVE MATERIALS

VISUAL THINKING ROUTINES

CONNECT – EXTEND - CHALLENGE

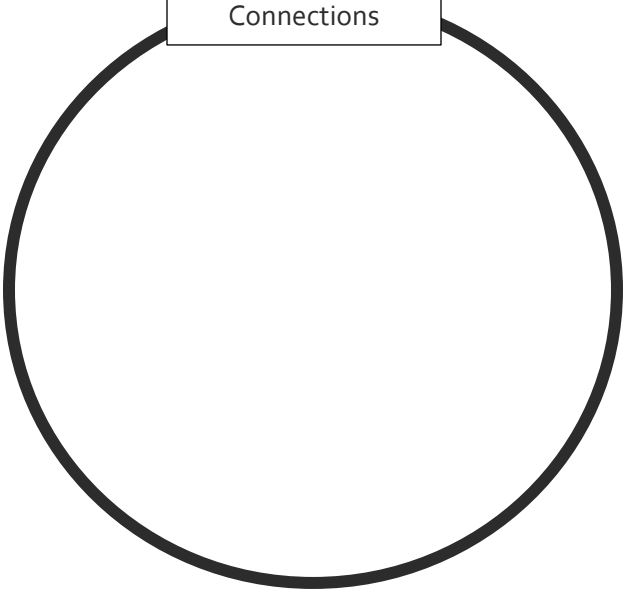
How are the ideas and information presented *connected* to what you already knew?
What new ideas did you get that *extended* or broadened your thinking in new directions?
What *challenges* or puzzles have come up in your mind from the ideas and information presented?

VISUAL THINKING ROUTINES

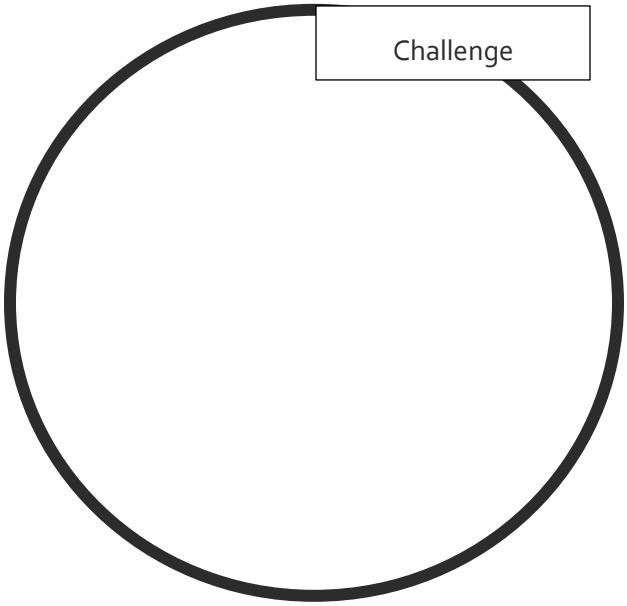
4C'S

Consider: _____

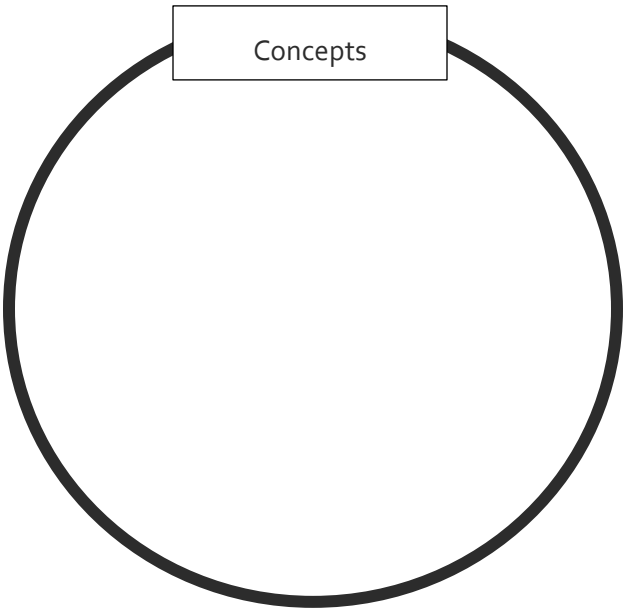
Connections



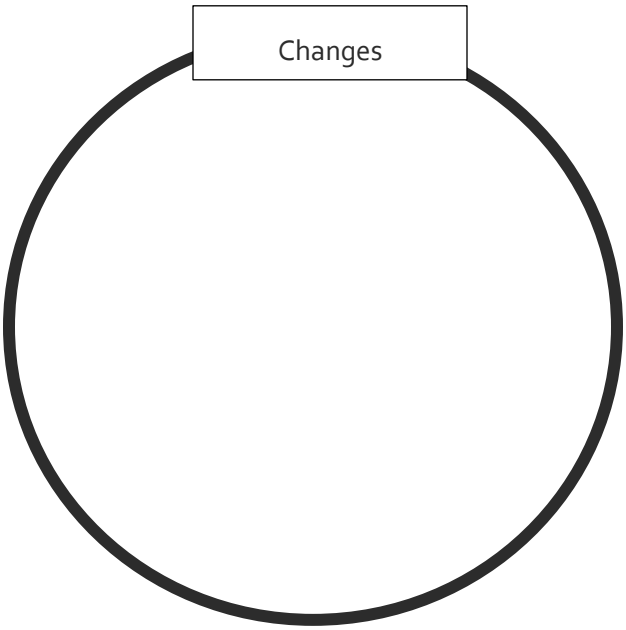
Challenge



Concepts



Changes



VISUAL THINKING ROUTINES

I USED TO THINK – NOW I THINK

I used to think that	Now I think that.....

VISUAL THINKING ROUTINES

STEP INSIDE

What can this person or thing see, observe, or notice?	What might the person or thing know, understand, hold, or believe?	What might the person or thing care deeply about?	What might the person or thing wonder about or question?

VISUAL THINKING ROUTINES

CLAIM – SUPPORT – QUESTION

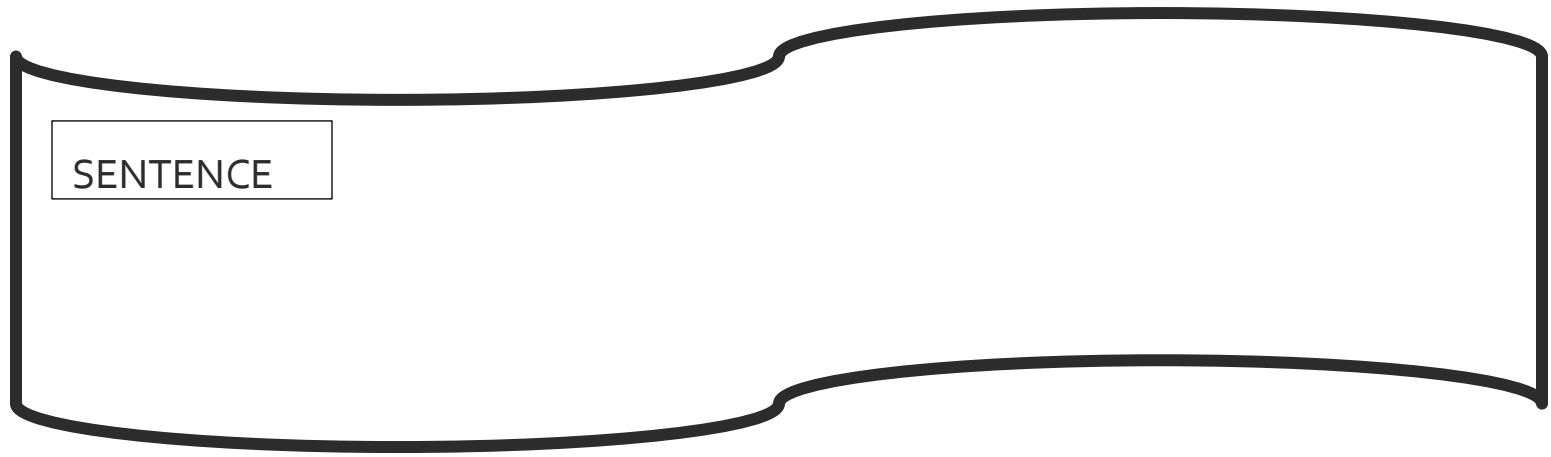
HOW DO WE KNOW WHETHER TWO EXPRESSIONS ARE EQUIVALENT OR NOT?

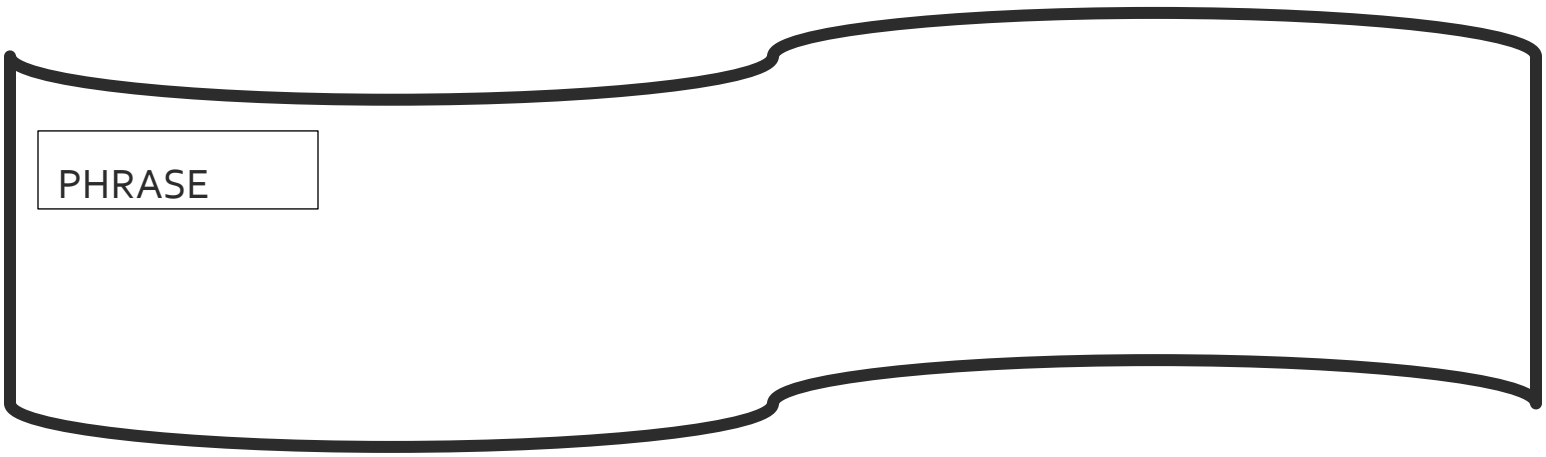
Make a **CLAIM** about the issue being explored.
Identify **SUPPORT** for you claim.
Raise a **QUESTION** related to your claim.

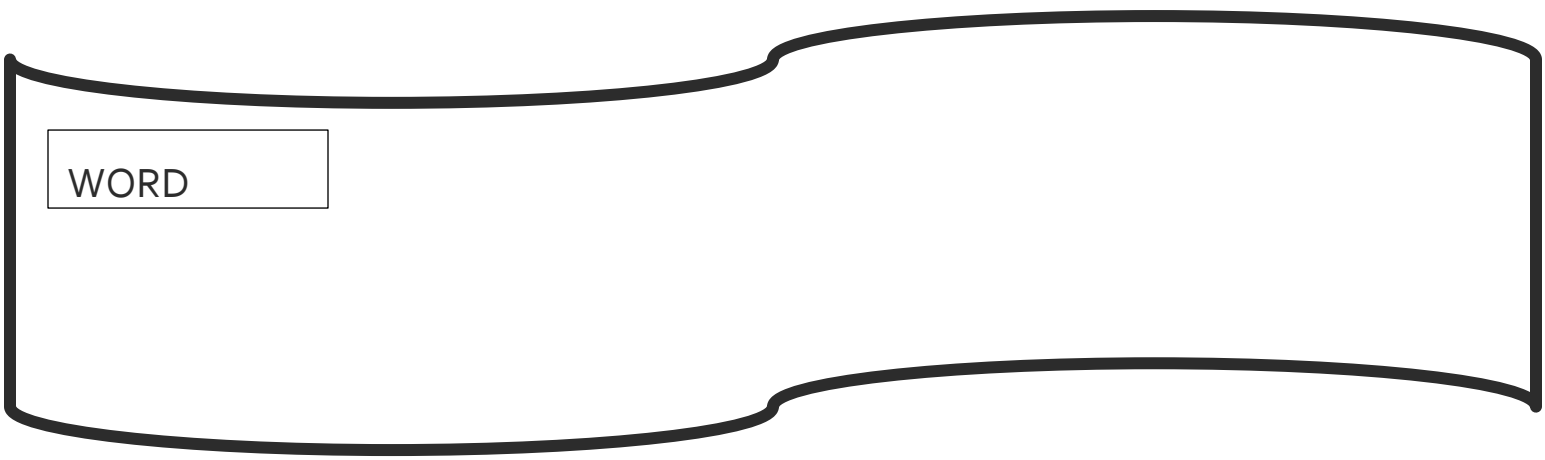
VISUAL THINKING ROUTINES

SENTENCE – PHRASE – WORD

Think of: **ELEMENTARY SCIENCE AND MATH METHODS**







Other Assessment and Exit Ticket Options: Padlet and Google Slides

Padlet as an Assessment Tool/Exit Ticket:

Utilizing Padlet as an assessment tool or exit ticket in my classroom offers a dynamic and interactive way to gauge my students' understanding and reflect on their learning at the end of a lesson or unit. Padlet's versatile platform allows for the creation of virtual "bulletin boards" where students can post their responses to a prompt, question, or task I've set. This method provides immediate insight into each student's grasp of the material covered, facilitating a quick and effective formative assessment.

Here's how I would implement Padlet for this purpose:

- At the end of a lesson, I'd create a Padlet board with a question or prompt related to the day's topic. This could range from "What was the most important thing you learned today?" to "Post a question you still have about today's lesson."
- Students would then post their responses anonymously or with their names. This allows for a variety of responses, including text, images, links, or even short videos, accommodating different learning styles and preferences.
- I would review the posts to assess understanding, identify common misconceptions, and gauge questions students may have. This immediate feedback is invaluable for adjusting future lessons and addressing any areas of confusion.

Padlet's flexibility and ease of use make it an excellent tool for quick assessments and for encouraging student participation and reflection. It also promotes a sense of community in the classroom as students can see and react to their peers' contributions.

Google Slides as an Assessment Tool/Exit Ticket:

Google Slides offers a collaborative and creative platform for using exit tickets as an assessment tool in my classroom. By leveraging Google Slides, students can collectively or individually demonstrate their understanding of lesson content in a visually engaging and interactive format.

Here's how I would use Google Slides for exit tickets:

- For individual assessments, I'd assign each student a slide in a shared Google Slides presentation at the end of a lesson or unit. Each slide would pose a question or prompt related to the material covered, such as summarizing key points, illustrating a concept with a diagram, or reflecting on the lesson's learning objectives.
- For a collaborative approach, students could be grouped and assigned a single slide to work on together. This method encourages teamwork and allows students to combine their knowledge and creativity to answer the question or complete the task.
- After students have completed their slides, I'd review each one to assess understanding, gather insights into students' perspectives, and identify areas that may need further clarification or reinforcement.

Google Slides not only serves as a versatile tool for assessment but also helps students develop digital literacy and presentation skills. The visual aspect of creating slides encourages students to think critically about how to best convey their understanding of the topic, while the collaborative features foster communication and teamwork.

In conclusion, both Padlet and Google Slides offer unique and effective ways to incorporate exit tickets as assessment tools in my classroom. Padlet's simplicity and versatility are great for quick reflections and gathering immediate feedback, while Google Slides offers a more in-depth and collaborative approach to assessing students' understanding and encouraging creative expression.

Gr.4 How do you understand a new idea?

- Brainstorm web
- YouTube Videos
- Listening
- Exploring real-world contexts
- Finding related ideas, situating the idea in contexts (think STSE)
- Conversations with people and peers
- Reading articles, books, wikipedia
- Hands-on activities
- Asking questions
- Taking notes

3-2-1

3 Insights:
(1) Curriculum should be designed with a greater focus on application as opposed to strict memorization (more skill-based).
(2) The importance of conceptual thinking is important to deeper understanding.
(3) Schools and boards reverting back to an isolationist approach is interesting in such a global world.

Structure of Knowledge

1: Image

3 Points:

1. Even in topics and concepts, we move from the bottom of the structure and up.
2. Curriculum designed to guide instruction and assessment by identifying conceptual understanding will break the cycle of confusion for students or them giving up on work.
3. How questions prompt

Structure of Knowledge Cont.

Insightful Facts
- Fact based education requires less thinking for student and teacher
- Understanding concepts and higher levels of knowledge is more applicable
- Facts provide an entry into dialogue

Questions:
how do you engage students in conceptual understanding without confusion;
how do you engage them in generalizations without overgeneralization
how do you present enough facts for them to work with to go to higher levels of thinking?

Structure of Knowledge

1. Identify the Concept when designing the content.
2. Student led Inquiry to develop critical thinking.
3. Students will develop the transferrable understanding.

Structure of Knowledge

3 Points:

- Students need to learn facts to understand concepts.
- When students understand concepts, they can make

Structure of Knowledge

Concept-based curriculum & Instruction

Insightful Points: It encourages critical thinking