Model Lessons For Math and Geography Activities

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Animal Habitat ~ Ten Frames
by Karen Adams

Teacher Planning Information

Overview: Families will use picture cards and Ten Frames in this activity. Each Ten Frame is labeled as an animal habitat. Cards will be in the center of the table and families will work together to look for, talk about and find animals that live in different habitats around the world. Decisions will be made to determine which habitat each animal belongs and ten frames will be used to collect data/animals. Totals will then be calculated and compared using a data collection sheet.

Objectives: In completing this activity, students should be able to…
• Identify animals and where they live.
• Identify characteristics of different habitats around the world.
• Use reasoning skills and give opinions to determine which habitat is the best home for an animal.
• Use ten frames to keep track of and categorize animals by their habitats.
• Compare and record data from ten frames on to a data collection sheet.

Oregon Common Core State Standards for Math:
1.0A.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).

National Geography Standards:
Standard 8: A geographically informed person knows and understands the characteristics and spatial distribution of ecosystems on Earth's surface.

Grades: K – 2

Time: 15 – 20 minutes
Materials:

- Copies of the 7 Habitat descriptions (pages 6-12)
- Multiple copies of Ten Frame - enough for each habitat to have more than one.
  - Laminate or use page protectors for each Ten Frame (to easily save and reuse for multiple families that visit this station)
- Print and pre-cut a variety of animal picture cards on cardstock. See examples on (pages 14-18)
- Copies of (page 5) “Instructions for the Activity”
- Cut out a large circle of blue or green butcher paper (to resemble a globe) - place picture cards on face down
- Copies of the data collection sheet (page 4)
- Pencils
- Optional: Copies of habitat diagram and world map (page 3) – this page can be distributed as a prize after completing the activity

Key Vocabulary: Habitats, Environments, Forest, Tropical Rain Forest, Deserts, Ocean, Marine life, Tundra and Polar regions, Grasslands, Freshwater, Ten Frames

Background Information: The environment or natural home where a wild animal lives is called its habitat. All animals need cover (shelter) from weather and predators; food and water for nourishment; and space to obtain food, water, and to attract a mate. A habitat varies depending upon its location on Earth, the elevation, climate, and altitude. These variables will determine the types of plants and animals that can survive in each habitat.

Sources:
Habitats of our world support animal life.

Geographers have many tools to help them learn about the Earth. These charts are tools to help you with learning where in the world the different types of habitats are located and what kind of animals live there.
**Data Collection Sheet:** Fill in the ten frames for each of the habitats that your team used: What is the total number of animals that you found for each habitat?

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Total Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tropical Rain Forest Habitats:</td>
<td></td>
</tr>
<tr>
<td>Forest Habitats:</td>
<td></td>
</tr>
<tr>
<td>Deserts Habitats:</td>
<td></td>
</tr>
<tr>
<td>Ocean Marine Habitats:</td>
<td></td>
</tr>
<tr>
<td>Grasslands Habitats:</td>
<td></td>
</tr>
<tr>
<td>Tundra and Polar Ice Habitats:</td>
<td></td>
</tr>
<tr>
<td>Freshwater Habitats:</td>
<td></td>
</tr>
</tbody>
</table>

Add them all together to get a total of all animals that you found:

\[ \text{Total} = \text{Total for each habitat} \]
Activity Steps: (Instructions) - Families work together to decide which habitat each animal belongs.

1. Each person may choose one or more habitat ten frame. (It is okay if there is more than one of each habitat for each round of play. Using multiple ten frames will require multi digit addition practice)

2. Family members all choose a card from the center of the table and work together to decide which habitat will be the best ecosystem for that animal to survive.

3. Place each animal on the appropriate ten frame.

4. Continue until all animals have been placed into a habitat ten frame.

5. Total the amount of animals for each habitat and record it on the data collection sheet.

6. Complete the data collection sheet and receive your own world habitat map.
Tropical Rain Forest Habitats: Ten Frame

Rainforest habitats are forests located around the tropics, which is a zone around the equator. Rainforests are different from other forests in the world because they get a lot of rain every year — this makes them damp and humid. The rain forest is nearly self-watering. Plants release water into the atmosphere through a process called transpiration. In the tropics, each canopy tree can release about 200 gallons (760 liters) of water each year. The moisture helps create the thick cloud cover that hangs over most rain forests. As many as 30 million species of plants and animals live in tropical rainforests.

Place an animal on your ten-frame only if you think its home is in the rain forest. What does your animal eat? How many animals did you find for your rain forest ten-frame?

(place ten-frame here – use more than one, as needed)
Freshwater Habitats: Ten Frame

Freshwater habitats include lakes and ponds, rivers, streams, springs, and wetlands. Only 3% of the world’s water is fresh water, and two-thirds of that is frozen in glaciers, unavailable for our use. Freshwater ecosystems make up less than 0.01% of the planet’s total surface area but they support more than 100,000 species, more than just fish. Worms, mollusks, crayfish and insect larvae burrow into muddy lake or creek bottoms. Reeds and rushes along the shores shelter frogs, newts, birds, mammals, newts, and amphibians.

Place an animal on your ten-frame only if you think its home is in freshwater. What does your animal eat? How many animals did you find for your freshwater ten-frame?

(place ten-frame here – use more than one as needed)
Tundra and Polar Ice Habitats: Ten Frame

Tundra, the Earth's coldest, and harshest habitats, are treeless regions found in the Arctic and on the tops of mountains, where the climate is cold and windy and there is little rainfall. Tundra lands are snow-covered for much of the year, until summer brings a burst of wildflowers. Mountain goats, sheep, marmots, and birds live in mountain, or alpine, tundra and feed on the low-lying plants and insects.

Place an animal on your ten-frame only if you think its home is in the tundra. What does your animal eat? How many animals did you find for your tundra ten-frame?

(place ten-frame here- use more than one as needed)
Forest Habitats: Ten Frame  

Forests provide habitat for a vast array of plants and animals, many of which are still undiscovered. They protect our watersheds. They inspire wonder and provide places for recreation. They supply the oxygen we need to survive. They provide the timber for products we use every day. Forests are so much more than a collection of trees. Forests are home to 80% of the variety of animals, fungi, plants, and bacteria. Forests take many forms, depending on their latitude, local soil, rainfall and prevailing temperatures.

Place an animal on your ten-frame only if you think its home is in a forest. What does your animal eat? How many animals did you find for your forest ten-frame?

(place ten-frame here – use more than one as needed)
Desert Habitats: Ten Frame

Deserts cover more than one fifth of the Earth's land, and they are found on every continent. A place that receives less than 10 inches (25 centimeters) of rain per year is considered a desert. Deserts are part of a wider classification of regions called "drylands." Deserts are biologically rich habitats with a vast array of animals and plants that have adapted to the harsh conditions.

Place an animal on your ten-frame only if you think its home is in a desert. What does your animal eat? How many animals did you find for your desert ten-frame?

(place ten-frame here – use more than one as needed)
Ocean and Tide pool Habitats: Ten Frame

Oceans also called Marine Habitats, contain the greatest diversity of life on Earth, from the freezing, polar-regions, to the warm waters of the tropics. Humans rely on the oceans for their important natural resources. Fishing is the principal livelihood for over 200 million people and provides the main source of protein for more than a billion. The ocean covers more than 70 percent of the surface of our planet. It's hard to imagine, but about 97 percent of the Earth's water can be found in our oceans. Of the tiny percentage that's not in the ocean, about two percent is frozen up in glaciers and ice caps.

Place an animal on your ten-frame only if you think its home is in the ocean. What does your animal eat? How many animals did you find for your ocean ten-frame?

(place ten-frame here – use more than one as needed)
Grassland Habitats: Ten Frame

Grasslands have many names—prairies in North America, Asian steppes, savannahs and veldts in Africa, Australian rangelands, and pampas, llanos and cerrados in South America. But they are all places where there is too little rain for trees to grow in great numbers. Instead, these lands are covered in grasses and grass-like plants that have growing points close to the soil and can keep on growing even after being nibbled on by animals. These grasses can support high densities of grazing animals, such as zebra, antelope and bison. And these herds in turn support predators, including lions and cheetahs.

Place an animal on your ten-frame only if you think its home is in the grassland. What does your animal eat? How many animals did you find for your grassland ten-frame?

(place ten frame here – use more than one, as needed)
Animal Cards:
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gila Monster</strong></td>
<td><strong>Saguaro Cactus</strong></td>
<td><strong>Roadrunner</strong></td>
<td><strong>Coyote</strong></td>
</tr>
<tr>
<td><strong>Elf Owl</strong></td>
<td><strong>Mule Deer</strong></td>
<td><strong>Javelina</strong></td>
<td><strong>Desert Tortoise</strong></td>
</tr>
<tr>
<td><strong>Ocotillo</strong></td>
<td><strong>Tarantula</strong></td>
<td><strong>Bobcat</strong></td>
<td><strong>Cholla Cactus</strong></td>
</tr>
<tr>
<td><strong>Desert Toad</strong></td>
<td><strong>Jackrabbit</strong></td>
<td><strong>Prickly Pear Cactus</strong></td>
<td><strong>Rattlesnake</strong></td>
</tr>
<tr>
<td>zebra</td>
<td>monkey</td>
<td>lion</td>
<td>elephant</td>
</tr>
<tr>
<td>----------</td>
<td>---------</td>
<td>---------</td>
<td>----------</td>
</tr>
<tr>
<td>giraffe</td>
<td>ostrich</td>
<td>alligator</td>
<td>snake</td>
</tr>
<tr>
<td>panda</td>
<td>otter</td>
<td>toucan</td>
<td>tiger</td>
</tr>
</tbody>
</table>
shark

dolphin

crab

octopus

fish

turtle

manatee

whale
Arrays
by Tyler Sexton

Teacher Planning Information

Overview: This activity is designed to help students strengthen multiplication skills by creating arrays based on their community.

Objectives: In completing this activity, students should be able to:
- Multiply small and large numbers
- Create a city based on their community by using arrays

Oregon Common Core State Standards for Math:

CCSS.MATH.CONTENT.2.OA.C.4:

Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns: write an equation to express the total as a sum of equal addends.

Oregon Geography Content Standards:

2.9: Describe physical and human characteristics of the community

Grade(s): 2nd

Time: 15 minutes

Materials:

- Pencils (one per participant)
- Assorted colors of 8.5x11 construction paper (two per participant)
- Blank, white 8.5x11 paper (two per participant)
- Scissors (one per participant)

Sources:
http://blogs.henrico.k12.va.us/trhart/2015/01/25/multiplication-array-city/
How to do this activity

1) First, visualize two of your favorite buildings in your community, such as a school, house, apartment, police station, etc. How many stories does each building have? How many windows do they have going across the front? How many windows do they have going up the building? This does not have to be exact.

2) Once you visualize your buildings write down on a sheet of blank, white paper the characteristics of this building based on the questions above.

3) Students will then grab a few pieces of construction paper and a piece of blank, white paper.

4) Students will then cut out buildings out of the construction paper and small squares out of the white paper. Do not cut a lot, start with the building you imagined and about 15 white squares.

5) Next, have students create arrays (see information page) based on buildings in their community. These can be houses, schools, library, etc. Let them be creative. If students need more squares, they can cut more, just do not let them cut squares the whole time.

6) When students are creating their arrays, make sure they are placing the multiplication problem at the bottom of their building, so leave a little space (See example entitled “Array City”). For example, if a students creates a building that is two stories high and five across, then the student should have 2x5=10 at the bottom of their building.

7) Afterwards, students can share their arrays with other students at the station.
Information Page

What is an array? Arrays are objects arranged in a specific pattern or order. For multiplication, an array is explained as equal groups of an object.

Example of array:
5 groups of 2 stars all together will equal 10

\[ 5 \times 2 = 10 \]
Cardinal Directions on a Compass Rose
by Karen Adams

Teacher Planning Information

Overview: Activity #1: “Animal Compass” - Families will use an “Animal Compass” to gain background information and practice with cardinal and ordinal directions. Activity #2: “Name the Animal ~ Who am I?” - Families will find the location of animals that have been placed in cardinal or ordinal locations around the room. The use of addition or subtraction will be used in order to label the degree on the compass where each animal is located.

Objectives:
• Families will gain practice and understanding of cardinal directions and how a compass rose helps us identify, understand and describe location.
• Families will use cardinal and ordinal directions and will understand what the markings (or degrees) represent on a compass.

Oregon Common Core State Standards for Math:
4.NBT.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Oregon Geography Standards:
1. How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.
2. How to use mental maps to organize information about people, places, and environments in a spatial context.

Grades: 3 - 5

Time: 20 minutes

Materials list: *

<table>
<thead>
<tr>
<th>Activity #1 – “Animal Compass” (page 4)</th>
<th>Activity #2 Questions “Name the Animal – Who Am I?” (page 8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity #1 – “Animal Compass Questions” (page 5)</td>
<td>Activity #2 – Answer sheet (page 9)</td>
</tr>
<tr>
<td>Activity #1 – Answer Sheet (page 6)</td>
<td>Activity #2 – Compass roses (page 7)</td>
</tr>
<tr>
<td>Background Information sheet (page 3)</td>
<td>Activity #2 – Cardinal Direction Posters for the wall: (page 10) (north, east, south ,west)</td>
</tr>
<tr>
<td>Pencils</td>
<td>Activity #2 – Printout Animal posters to post on the walls (pages 11-14)</td>
</tr>
</tbody>
</table>

* Tip: If possible, print both of the activity sheets out with the answer sheets back-to-back.
Key Vocabulary: Compass rose, Points on a compass, Cardinal Directions, degrees, north, south, east, west.

Activity Descriptions:
* Note: Page 3 provides background information to help with this activity.

Activity #1 – “Name the Animal – Who am I?”
This activity will provide practice with using cardinal directions on a compass rose. Families will use the “Animal Compass” (page 4) to answer questions on the worksheet (page 5) and gain familiarity with the eight main points of a compass.

Answer sheet (page 6)

Activity #2 is a two-part activity:
Handout questions (page 8) and answers, (page 9)
Tools needed: Cardinal and Ordinal Compasses (page 7); Information sheet (page 3); pencils; posters of N, E, S, W on the walls (page 10), and animal posters (pages 11-14) or use stuffed animals placed in specified locations around the room.

Part A – Post the four main cardinal posters (page 10) North, East, South, West, on the four appropriate walls of the classroom. Post 8 pictures animals or (8 stuffed animals) in the specified locations as described below (one animal on each of the eight main compass points).

* Classroom placement of Animals (below) correlate with the questions on the worksheet.

(Animal pictures are provided for making posters - pages 11-14)

<table>
<thead>
<tr>
<th>Gorilla – northwest corner</th>
<th>Rabbit – west wall</th>
<th>Toucan – southwest corner</th>
<th>Elephant – south wall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bear – southeast corner</td>
<td>Beaver – east wall</td>
<td>Snake – northeast corner</td>
<td>Dog – north wall</td>
</tr>
</tbody>
</table>

If you choose to use different animals or stuffed animals, you will need to change the animal names in the worksheet and the answers in the answer sheet.

Families can work together to answer the questions and challenge questions on (page 8).

Families will need the small compasses on page 7 for both parts of this activity.

Challenge questions for Activity #2 are provided. (Challenge questions) - The second part of each answer will require adding or subtracting 45° from the degree of one of the cardinal directions in order to answer each question. Families will need to use the ordinal compass rose that shows some of the degree markings (bottom of page 7) in order to do the math. Families must label each answer with the correlating degree marking.

Answer sheet (page 9). Background Information sheet (page 3).

*Tip: If possible, print both of the activity sheets out with the answer sheets back-to-back.
Background Information:

Direction is used to determine where things are in relation to other things. Compass skills help us with directions. Mental mapping, abstract reasoning and the ability to visualize when problem solving, are important skills for understanding the world around us.

A compass needle aligns itself and points toward the top of Earth's magnetic field. Since compasses always point north, they become a tool to help us figure out where we are or in which direction we want to go.

The four cardinal directions are marked on a compass as north (₀ or 360°), east (⁹₀°), south (₁₈₀°), west (₂₇₀°), with the total points of a compass equaling 360°. The intermediate points are NE (₄₅°), SE (₁₃₅°), SW(₂₂₅°), NW (₃₁₅°). The diagram above shows that there are 45 points between each of the 8 main points of a compass.

The Four Cardinal Directions on the compass:

- North (N): ₀° = 360°
- East (E): ⁹₀°
- South (S): ₁₈₀°
- West (W): ₂₇₀°

An inter-cardinal or ordinal direction is one of the four intermediate compass directions located halfway between the cardinal directions.

- Northeast (NE), ₄₅°, halfway between north and east, is the opposite of southwest.
- Southeast (SE), ₁₃₅°, halfway between south and east, is the opposite of northwest.
- Southwest (SW), ₂₂₅°, halfway between south and west, is the opposite of northeast.
- Northwest (NW), ₃₁₅°, halfway between north and west, is the opposite of southeast.
Activity #1 – Animal Compass:
Activity #1 – “Animal Compass Questions”- Learning about cardinal directions using a compass rose:

The ____________________________ is located nearest the southwest point of this compass rose.

Which animal is located nearest the northwest point of this compass rose?

----------------------------------------------------------------------------------------------------------------------------------

Which animal is located nearest the southeast point of this compass rose?

----------------------------------------------------------------------------------------------------------------------------------

Name one animal that is located north of the kitten.

----------------------------------------------------------------------------------------------------------------------------------

Name one animal that is located south of the horse.

----------------------------------------------------------------------------------------------------------------------------------
Activity #1 – “Animal Compass” - Learning about cardinal directions using a compass rose:

The ___kitten___ is located nearest the southwest point of this compass rose.

Which animal is located nearest the northwest point of this compass rose? ___Owl___

Which animal is located nearest the southeast point of this compass rose? ___Giraffe___

Name one animal that is located north of the kitten. ___rabbit, owl, bear, horse, or elephant___

Name one animal that is located south of the horse ___rabbit, cat, giraffe, elephant, or penguin___
Activity #2: “Name the Animal – Who Am I?” Compass Roses for the Family Cardinal Directions
Activity #2 Questions - “Name the Animal – Who Am I?”

Write the name of each animal described in the following: Animals are posted around the classroom. (Some of the questions may have more than one correct answer)

Look for the * for the Challenge questions - Once you find each animal, you may either add 45° to or subtract 45° from one of the nearest cardinal direction in order to answer the second part of the question.

For example: The first one is done for you… (270° + 45° = 315°) or (360° – 45° = 315°)

1. I am located in the northwestern corner of the classroom. Who am I? __Gorilla__

   *(1a)- You may either add 45° to or subtract 45° from one of the nearest cardinal to find out the degree this would be on a compass. (270° + 45° = NW 315°) or (360° – 45° = NW 315°)

2. I am located south of the Gorilla and north of the Toucan. Who am I?

   ____________________________________________________________

   *(2a)- What degree is this on the compass? ___________________________

3. I am located north of the Rabbit, Beaver and Elephant. Who am I?

   ____________________________________________________________

   *(3a) – What degree is this on the compass? ___________________________

4. I am located south of the Beaver. Who am I? ___________________________

   *(4a) - What degree is this on the compass? ___________________________

5. I am located south of the dog and north of the Beaver. Who am I?

   ____________________________________________________________

   *(5a) - What degree is this on the compass? ___________________________

6. Imagine, if you were to walk in a straight line diagonally from the Snake to the northwest direction of the classroom, it will lead you to me. Who am I?

   ____________________________________________________________

   *(6a) What degree is this on the compass? ___________________________

7. Imagine, if you were to walk in a straight line south from the Dog across the middle of the classroom, it would lead you to me. Who am I?

   ____________________________________________________________

   *(7a) - What degree is this on the compass? ___________________________
Answer sheet: Family Geography Night: **Activity #2- “Name the Animal- Who am I?”**

*For the Challenge questions* Once you find each animal, you may either add 45 to or subtract 45 from one of the nearest cardinal direction in order to answer the second part of each question. For example: The first one is done for you... \(270 + 45 = 315\) or \(360 - 45 = 315\)

1. I am located in the northwestern corner of the classroom. Who am I? _____ **Gorilla**

*(1a)- You may either add 45 to or subtract 45 from one of the nearest cardinal points to find out the degree this would be on a compass. \(270 + 45 = NW\ 315^\circ\) or \(360 - 45 = NW\ 315^\circ\)*

2. I am located south of the Gorilla and north of the Toucan. Who am I? ____ **Rabbit**

(2a)-What degree is this on the compass? ____ \(W\ 270^\circ\)

3. I am located north of the Rabbit, Beaver and Elephant. Who am I? **(Gorilla, Snake, or Dog)**

*(3a)-**Gorilla** \(270 + 45 = NW\ 315^\circ\)   **Snake** \(0 + 45 = NE\ 45^\circ\)   **Dog** \(N\ 0^\circ\) or \(N\ 360^\circ\)*

4. I am located south of the Beaver. Who am I? **(Bear, Toucan, or Elephant)**

*(4a)-**Bear** \(90 + 45 = SE\ 135^\circ\)   **Toucan** \(180 + 45 = SW\ 225^\circ\)   **Elephant** \(S\ 180^\circ\)*

5. I am located south of the dog and north of the Beaver. Who am I? **(Snake)**

(5a)- **(NE\ 45^\circ)**

6. Imagine, if you were to walk in a straight line diagonally from the Snake to the northwest direction of the classroom, it will lead you to me. Who am I? **(Gorilla)**

*(6a)- **(270 + 45 = NW\ 315^\circ) or (360-45= NW\ 315^\circ)**

7. Imagine, if you were to walk in a straight line directly south from the Dog across the middle of the classroom, it would lead you to me. Who am I? **Elephant**

(7a)- **(S\ 180^\circ)**
Continent Population

Teacher planning information

**Overview:** This activity is designed to introduce students to the basics of population on each continent.

**Objectives:** In completing this activity, students should be able to:
- Order continents by population
- Use basic geographic knowledge to reason why some continents have a larger population than others

**Oregon Common Core State Standards for Math:** K.MD 2 and 3, 1.MD 4, 2.OA 1, 3.MD 7

**Oregon Geography Content Standards:** K 7 and 11, 1.9, 2.10, 3.12

**Grades:** K-3

**Time:** 10 minutes

**Materials:**
- Continents with Population sheet (included)
- Questions sheet (included)
- Writing utensils (nothing specific; pens, pencils, markers, etc.)

**Activity set up:** Print out enough of the *Questions* sheets for each participant, and make sure each participant has a writing utensil. Print out at least one of the *Continents with Population*, and *How to do this Activity* sheets, and tape in place for everyone to use.
How to do this activity

Step 1.
Take a writing utensil, a *Continents with Population* map, and a *Questions* sheet.

Step 2.
Look at the map of the world. Do you know what continent you live on?

Step 3.
Use the map to fill out the *Questions* sheet.
Questions

Using the map of the world with continents population, list the continents from the one with the most people on it, to the one with the fewest people on it:

1. ________________________________ (most people)
2. ________________________________
3. ________________________________
4. ________________________________
5. ________________________________
6. ________________________________
7. ________________________________ (fewest people)

Why do you think some continents have more people than other continents?
__________________________________________________________
__________________________________________________________
__________________________________________________________

Can you name a country in each continent (Antarctica is both a country and a continent)?
__________________________________________________________
__________________________________________________________
__________________________________________________________
Different parts of the world have different cultures and customs than what we are used to. Do you know of any foreign cultures or customs?

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

There are many different natural resources throughout the world due to different continents being in different locations across the earth. North America produces most of the world’s corn and wheat, for example. Do you know of any natural resources on different continents?

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

___________________________________________________________________
Counting the States
by Tyler Sexton

Teacher Planning Information

Overview: This activity is designed to help students learn the basic locations of the fifty states in the United States, as well as learn the names of these states. Students will also learn how to count by ones, fives, and tens using a small map of the United States to help them count.

Objectives: In completing this activity, students should be able to:
• develop skills in counting by ones, fives, and tens
• identify names and locations of the fifty states

Oregon Common Core State Standards for Math:

CCSS.MATH.CONTENT.K.CC.A.1
Count to 100 by ones and by tens.

CCSS.MATH.CONTENT.K.CC.B.4.A
When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

Oregon Geography Content Standards:

K.11. Use terms related to location, direction, and distance (e.g., over/under, here/there, left/right, above/below, forward/backward, between).

Grades: Kindergarten

Time: 15 minutes

Materials:
• Paper map of the United States (provided)

Sources:
How to do this activity

1. Students will be given a paper map of the United States.

2. The students will then count the number of states by ones while also saying the name of the state.

3. Next, the students will count the number of states by counting by fives.

4. Then, the students will count the number of states by tens.

5. When the counting is done, an adult will name a state and the students will give the general location of the state by saying terms such as, “here, there, over there,” etc.
Overview: This activity is designed to build an understanding that flags are connected to a country and that the attributes of the flag often have symbolic meaning. Students will study the American flag, and then create their own flag to represent themselves.

Objectives: In completing this activity students should be able to:
- Count the number of stars on the American flag
- Count the number of stripes on the American flag
- Identify the geometric shapes on the American flag
- Identify the three colors on the American flag
- Explain that the stripes represent the 13 colonies
- Explain that the stars represent the 50 states

Oregon Common Core State Standards for Math:
K.CC.B Count to tell the number of objects
K.G.H. Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).

Oregon Geography Content Standards:
K.7. Identify and compare and contrast pictures (flags), maps and globes.

Grade: K

Time: 15 minutes

Materials:
- Crayons, markers or colored pencils (for coloring flags). Make sure you have plenty of red, white and blue colors.
- Popsicle sticks or wooden skewers (one per person)
- Liquid Glue (1-3 bottles)
- Tape (1-3 rolls)
- Pencils or Pens (10)
- Copies of “American Flag for Coloring” (cut in half so there is enough for 1 flag to color per person)
- Copies of “Blank Rectangles for Personal Flags” (cut in half so there are enough for one blank flag per person)
● Copies of “Folding the American Flag” (10)
● Copies of “Flags to Practice Folding” (cut in half so there are enough for one flag to fold per person)

Sources:
The information about the flags meanings: (List 25 LLC http://list25.com/25-national-flags-and-their-meanings/5/)
The information about flying flags at half mast: (HALF STAFF AMERICAN FLAG NOTIFICATIONS http://us.halfstaff.org/)
The coloring page retrieved from: (Coloring Castle http://www.coloringcastle.com/flag_coloring_pages.html)
The American flag on a popsicle stick image from: (Pinterest. https://www.pinterest.com/pin/297800594086692927/)
Flag Etiquette Information from: (USA Flag Site. http://www.usa-flag-site.org/etiquette-display/)
How To Do This Activity

**Introduction: Flag Study**
Consider and discuss the following questions:
1. What shape is the American flag?
2. How many colors are on the American flag?
3. How many different shapes are on the American flag?
4. Count the number of stars on the flag. What do you think the stars represent?
5. Count the number of stripes on the flag (don’t forget to count the white stripes). What do you think the stripes represent?
6. Does the American flag have any words on it?

**Answer Key:**
1. A rectangle
2. Three different colors (red, white, blue).
3. Three. Stars, rectangles, and stripes (stripes are an elongated rectangle/parallelogram).
4. There are 50 stars that represent the 50 states.
5. There are 13 stripes that represent the first 13 colonies.
6. There are no words on the American flag. Only colors and shapes that symbolize characteristics.

**Activity**
1. Using the correct colors of the American flag, color the paper copies of the flag.
2. On the back of your American flag write the facts about the flag discussed in the introduction. At a minimum include the following on the back of your flag:
   - 50 stars represent 50 states
   - 13 stripes represent the first 13 colonies
3. Create a new flag that represents you. Use the blank rectangle sheets of paper.
   - Include at least 1 shape: what does your shape represent?
   - Include at least 1 color: what does your color represent?
○ If possible, try not to use any words on your flag. Do your best to use color and shapes to represent your personal characteristics. Examples:
  ■ I used the color yellow to represent that I am always happy.
  ■ I used the color brown because it is the color of my skin.
  ■ I used the repetitive shape of a square to represent my characteristic of being very organized.
  ■ I traced the shape of my left hand to symbolize I am my own person.
○ On the back of your flag, write what the colors and shapes represent.
○ Glue or tape your personal flag onto a popsicle stick or wooden skewer. Example of American flag on popsicle stick/wooden skewer:

![American flag on popsicle stick]

**Extension:** Practice folding the American flag with the directions provided.

**Closure**
Consider the following questions:
1. Where do you often see flagpoles?
2. What does it mean to fly a flag at half-mast?
3. Why do we do this?
4. Who are the only two people who have the authority to issue the flag being flown at half-mast?
Answer Key:

1. Outside of any government building such as police stations, fire stations, City Halls, libraries, or schools. Outside of schools, grocery stores, or personal homes. Inside of sports stadiums or classrooms. And many other places too!

2. Half-mast means lowering the flag to one-half the distance between the top and bottom of the staff.

3. When a person who is important to the American Government dies, or anyone who is a friend of our country as a mark of respect to their memory.

4. The President of the United States and The Governor of that State
American Flag for Coloring

1. Red 2. Blue Unmarked = White

1. Red 2. Blue Unmarked = White
Blank Rectangles for Personal Flags
Folding the American Flag

If you have more time, practice folding the American flag using rectangle paper. Follow these directions:
Flags to Practice Folding
Overview: This activity is designed to help students identify what scale is by using their feet to measure distances on a map and convert their “foot” scale into feet, inches, and yards.

Objectives: In completing this activity, students should be able to:
• Identify what scale is and how to use it on maps
• Accurately convert feet to inches and yards

Oregon Common Core State Standards for Math:
CCSS.MATH.CONTENT.5.MD.A.1: Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Oregon Geography Content Standards:
3.7: Use a simple grid system, symbols, and other information to locate the physical and political features of places on maps and globes.

Grades: 3-5

Time: 15 minutes

Materials:
• Giant map of the United States (to be ordered from C-GEO)*
• Copies of Worksheet (provided)
• Pencils
• Calculators
• 12 inch rulers

*Giant map of the United States - www.pdx.edu/geography-education/giant-floor-maps
How to do this activity

1. Students will take off their shoes before they step on the Giant map of the United States.

2. A student will start by standing near Salem, Oregon, and the adult will tell the student to walk (toe to toe) in a straight line from Oregon to Topeka, Kansas. As the student walks, the student will need to count how many steps it takes to get from Oregon to Kansas.

3. The adult can do this activity with several students. Afterwards the adult will explain to the students that they have actually used their own feet as a scale and will explain that scale is used on maps to figure out how far a place is on a map.

4. Students will be given worksheets to complete individually with the help of an adult.

5. After completing the worksheet, the students will put on their shoes and go to the next station.
Worksheet:

Now that you know what scale is and how it is used, please answer these questions and use the ruler and calculator provided. Also, please refer to these conversions when answering the questions:

- 12 inches to 1 foot
- 3 feet to 1 yard
- 1 yard to 36 inches

1. Number of your “feet” that it took to get from Salem, Oregon to Topeka, Kansas?

2. Using the ruler and the giant map, measure the number of feet it is from Salem, Oregon, to Dallas, Texas.

3. Using the ruler and the giant map, find out how many yards there are from Salem, Oregon, to St. Paul, Minnesota.

4. Using the ruler and the giant map, measure the number of inches there are from Salem, Oregon, to Nashville, Tennessee.

5. Now that you have the distance from Salem, Oregon, to Nashville, Tennessee, in inches, convert that distance to yards.

6. Using the ruler, find out how many inches, feet and yards there are from Salem, Oregon to another location of your choice.
Hemispheres: Toss, Tally and Total
by Karen Adams

Teacher Planning Information

Overview: Toss an inflatable globe to one another and keep track of the number of fingers that land on different hemispheres after each catch. Tally marks will be used and totaled after ten tosses. The results can then be graphed. Discussion questions incorporate both geographic concepts (equator, prime meridian, hemispheres, southern, northern, eastern, western, water, land) and math concepts (more, most, chance). NOTE: Extensions for older students can include fractions, percentages and probability.

Objectives: In completing this activity, students should be able to:
- Name and locate (northern and southern) and/or (the eastern and western) and/or (land and water) hemispheres as represented on an inflatable globe.
- Name and identify the equator, prime meridian and 180° meridian on a globe.
- Use tally marks as a tool to keep track of data and use addition to analyze and interpret data.
- Answer questions about the results of data.

Oregon Common Core State Standards for Math:
3.NBT.2. - Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
3.NF.1 - Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.

National Geography Standards:
Standard 1 - How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.
Standard 5 - That people create regions to interpret Earth's complexity.
Standard 6 - How culture and experience influence people's perceptions of places and regions.

Grades: K – 3

Time: 15 minutes

Materials:
Each family will need...
- Inflatable globe
- Pencils
- Tally sheet (page 4)
- Reflection questions (page 5)
- Background Information Sheet (page 3)

Key Vocabulary: northern hemisphere, southern hemisphere, eastern hemisphere, western hemisphere, prime meridian, 180° meridian, equator, more often, most, less often, chance, fraction, percentage, out of 100, comparisons, probability, patterns, observations, analyze, compare, contrast
How to do this Activity

Step 1:
Assign someone the task of tallying after each toss using the Tally Mark Chart (page 4).

Step 2:
Toss an inflatable globe to one another. After each toss keep track of the number of fingers that land on each of the two hemispheres for ten tosses. Everyone should count together to keep track of the number of tosses. Each time the group has ten tosses, stop to total the tally marks to analyze the data for that round. (10 fingers X 10 tosses = 100) This allows for comparisons to be made between the number of tally marks for each hemisphere.

Step 3:
Three rounds of 10 tosses will allow for different hemispheres to be recorded on the tally sheet: Round 1 = (northern/southern) Round 2 = (eastern/western) Round 3 = (water/land).

NOTES:
- This activity allows for practice with addition, subtraction, creating fractions, percent, tally marks and data analysis and probability, depending upon the grade-level.
- Use the “Background Information sheet” (page 3) to help with the concept of hemispheres.
- Use the reflection question sheet (page 5) to reflect upon the mathematical and geographical concepts.
Background Information:

The Hemispheres of the Earth in geography and cartography refer to any division of the globe into two hemispheres (from Ancient Greek meaning "half of a sphere"). The most common divisions of the globe are by latitude (north-south) or longitude (east-west):

- **North-South** (The Equator is the dividing line)
  - Northern Hemisphere, the half that is north of the equator
  - Southern Hemisphere, the half that lies south of the equator

- **East-West**
  - Eastern Hemisphere, the half that is east of the prime meridian and west of the 180th meridian
  - Western Hemisphere, the half that lies west of the prime meridian and east of the 180th meridian

- **Land-Water**
  - Land hemisphere: The hemisphere on the Earth containing the largest possible area of land
  - Water hemisphere: The hemisphere on the Earth containing the largest area of water
<table>
<thead>
<tr>
<th>Tally Mark Chart:</th>
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<tbody>
<tr>
<td><strong>Northern hemisphere</strong></td>
<td><strong>Southern hemisphere</strong></td>
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<tr>
<td>Tally marks:</td>
<td>Tally marks:</td>
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<tr>
<td>Total out of 10 tosses:</td>
<td>Total out of 10 tosses:</td>
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<td>Total out of 10 tosses:</td>
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<tr>
<td>Fraction /100</td>
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<tr>
<td><strong>Eastern hemisphere</strong></td>
<td><strong>Western hemisphere</strong></td>
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<td>Tally marks:</td>
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<td>Total out of 10 tosses:</td>
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<td>Fraction /100</td>
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<td><strong>Land hemisphere</strong></td>
<td><strong>Water hemisphere</strong></td>
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<td>Tally marks:</td>
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<td>Total out of 10 tosses:</td>
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<td>Fraction: /100</td>
<td>Fraction: /100</td>
</tr>
</tbody>
</table>
Reflection Questions:

Which hemisphere had the most tally marks? ____________________________

Which hemisphere had the least tally marks? ____________________________

Complete the following fractions:

Northern hemisphere /300 Southern hemisphere /300
Eastern hemisphere /300 Western hemisphere /300
Land hemisphere /300 Water hemisphere /300

What observations can you make about these fractions? Do you notice any patterns?

Fill in the blanks:

The northern hemisphere received ________ tally marks out of ________ tosses, as compared to the southern hemisphere, which received ________ tally marks out of ________ tosses.

Looking at the data, which hemisphere appears to be (more probable) or has a “greater” chance of receiving more tally marks?

___________________________________________

What data can you site to support your answer?

Which hemisphere appears to have a lesser chance, (or is less-probable) to receive the most tally marks. ________________________________

What data is there to support your answer?

What correlations might be observed between the mathematical data you collected in this activity and what you observe about the physical geography of the earth?
Location and Conversion
by Tyler Sexton

Teacher Planning Information

Overview: This activity is designed to help students locate countries on a map and to help strengthen conversion skills in a fun and active way.

Objectives: In completing this activity, students should be able to:
• Identify countries or continents on a map
• Correctly convert yards to feet, and seconds to miles per hour

Oregon Common Core State Standards for Math:

CCSS.MATH.CONTENT.5.MD.A.1
Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Oregon Geography Content Standards:

3.6. Identify hemispheres, continents and oceans using globes and maps.

Grades: 3-5  Time: 15 minutes

Materials:
• Giant map of the world with continents and countries
• Two digital timers
• Blank lined paper
• Pencil
• Two small cones
• Tape to mark starting point
• Small map of the world with countries and continents labeled.

Sources:
Printable map with countries: http://www.mapsofworld.com/world-map.pdf
Giant map of the World: http://www.pdx.edu/geography-education/giant-floor-maps
How to do this activity

1. Review the Information Page for details on how to do conversions.

2. Students (no more than 2) will stand at least 20 yards away from the giant map of the world with a cone in their hand.
   Notes: Pre-mark the starting point with tape ahead of time. Also, be sure participants take their shoes off before standing on the giant map.

3. Adult will stand near the giant map with two digital timers, ready to call out a country or continent from the small map provided.

4. Adult will call out a country or continent and start a timer for each student.

5. Students will run as fast as they can to the giant map and place their cone on the correct location, once the student places the cone on the correct location, the adult will stop the timer and give the time in seconds (or minutes depending on how long it took) to the students.

6. After the students receive their time, the students will convert their time and distance to miles per hour.
Information Page

Students will convert the starting distance, which is 18 yards to miles. Students can do this by either converting directly from yards to miles or if they wish, they can convert yards to feet and then to miles.

In terms of their time, students will get their time from the timer, the timer starts when the adult says go and the timer stops when the students places their cone on the correct country. Students will take their time, whether it is seconds or minutes and convert their time to hours.

After the students get their distance and time converted to miles per hour, (Note, these will be very small numbers, most likely decimals) the students will divide their distance from their time to get another decimal number. Students will take this number and multiply it by 100 to see how many miles per hour they were going.

Conversions:

3 feet to 1 yard
1730 yards to 1 mile
5280 feet to 1 mile
60 seconds to 1 minute
60 minutes to 1 hour
Map of the World: *(Also available in “Sources”)*
Overview: This activity is designed to teach students about landmarks and scale.

Objectives: In completing this activity, students should be able to:
- Understand the concept of landmarks
- Locate the states where major US landmarks are
- Understand differences in scale
- Make scale comparisons

Oregon Common Core State Standards for Math: Measurement and Data (2.MD):
- measure and estimate lengths in standard units,
- relate addition and subtraction to length,
- represent and interpret data.

Oregon Geography Content Standards: 2.7, 2.10, 3.13.

Grades: 2-3

Time: 15 minutes

Materials:
- Tape measures (at least 5 feet long)
- Writing utensils (any kind)
- Pictures of famous US landmarks (included)
- Statue of Liberty Statistics activity page (included)
- Other Monument Sizes activity page (included)
- US map with states labeled (included)
- Calculators (optional)

Activity set up: Print out the Statue of Liberty Statistics,
How to do this activity:

**Step 1:**
Look at the pictures of the different landmarks. Do you recognize any of them? Do you know where any are located on the map? What do landmarks represent? Can you think of any landmarks near your home or school?

**Step 2:**
Take one of the maps of the United States and a writing utensil. In which state is each landmark located? Mark each state with a big dot. *Bonus:* Mark Oregon with a star too.

**Step 3:**
Look at the “What is Scale?” sheet, and learn about the three different ways of showing scale and ratio.

**Step 4:**
Find the picture of the Statue of Liberty. Take one of the “Statue of Liberty Statistics” activity pages, a tape measure, and a writing utensil. Have someone help you measure your height, and write down your answer on the sheet. Calculate the differences in size between you and the statue. You will see that you and the statue are in different scales!

**Step 5:**
Take one of the “Other Monument Sizes” sheets. Look at the landmark photos again to compare your size to the landmark.
What is *scale*?

When we determine how many of one unit it takes to span the length or height of a tall or long object (like a map or a landmark), it’s known as *scale*. For this exercise, we will be using math to calculate how our individual height relates to the height and length of major US landmarks.

Scale can be shown in three ways:

- **Graphic Scale**: uses a *Scale Bar* to visually depict the ratio.

- **Verbal Scale**: uses words to depict the ratio, “one inch equals one mile”.

- **Representative Fraction**: uses numbers to depict the ratio. If the representative fraction is 1:100, this tells you that one unit (inch, centimeter, meter, etc.) is equal to 100 of the same units.
Statue of Liberty Statistics

Height of the Statue of Liberty (from feet to top of head)  
= 111 feet 1 inch = 1,333 inches

Measure to see how tall you are. Mark your height in inches on the line below.

My height in inches: _______________________

Next, divide your height into the height of the Statue of Liberty.

1,333 divided by my height = _______________

Use the representative fraction method of showing scale to see how many of you it would take stacked on top of one another to reach the height of the Statue of Liberty.

Therefore, the scale is: 1: _______________
Other Monument Sizes

My height is: ____________________ in inches

Gateway Arch:
• Maximum height = 630 feet = **7,560 inches**
It would take ______________________ of me stacked on top of one another to reach the height of the Gateway Arch!

Golden Gate Bridge:
• Length of the bridge = 8,981 feet (1.7 miles) = **107,772 inches**
It would take __________________________ of me stacked end to end to span the length of the Golden Gate Bridge!

Washington Monument:
• Height = 555 feet 5 inches = **6,665 inches**
It would take __________________________ of me stacked on top of one another to reach the height of the Washington Monument!

Space Needle:
• Height = 605 feet = **7,260 inches**
It would take __________________________ of me stacked on top of one another to reach the height of the Space Needle!
Gateway Arch. St. Louis, MO. Completed in 1967.
Washington Monument. Washington, D.C. Completed in 1884
Mark on this map the state in which each monument can be found!
Sources:

All images from Wikimedia Commons
Monument statistics from the National Park Service, spaceneedle.com, and goldengatebridge.org
Map Coordinates – Taxicab Driver
by Karen Adams

Teacher Planning Information

Overview: Imagine that you are a Taxicab Driver and you need to give people rides to and from different locations in the city. In this activity, you will use a city map, learn to read the map coordinates and give directions to various places in the city.

Objectives: Families will use map coordinates to label and locate places on a city map.

Oregon Common Core State Standards for Math:
Mathematical practices for this activity include…
1. Making sense of problems and persevere in solving them.
5. Using appropriate tools strategically.
7. Looking for and making use of structure.

Oregon Geography Standards:
3.7. Use a simple grid system, symbols, and other information to locate the physical and political features of places on maps and globes.

Grades: K – 3

Time: 20 minutes

Materials:
- Optional: Provide miniature cars or use cardstock to print and cut out taxis (page 6).
- Printout of the city map (page 3) with map coordinate questions (page 2) and the answer sheet (page 4).
  * Tip: It is helpful to print the questions and answer sheets back-to-back so families can check their answers easily.
- Pencils

Key Vocabulary: coordinates, directions, left, right, north, east, south, west, city block, corner
Map Coordinate Questions:

Taxicab drivers give people a ride from place to place. They need to know how to read a map and how to read the coordinates on a map.

Calls are coming in: Drive the car to each location. Use the map coordinates to help you answer each question. The coordinates on the map below represent one city block.

1. You are waiting at the Taxi Stand. Someone just called from the post office and wants a ride.
   a. How many blocks forward would you drive from the taxi stand to get to the post office?
      __________
   b. You will need to turn left to get to the post office. What street will you turn left on?
      __________
   c. After turning left, how many more blocks will you need to drive to get to the post office?
      __________

      Great Job! You just picked up your first passenger! 😊

2. While you are waiting for another call at the Taxi Stand you study the map. Find the coordinates for…

   The Library _______ Book Store _______ Grocery Store _______ Post Office _______

3. Suppose you were at the Post Office and received a call to pick up someone at the book store. Describe the shortest way to get to there.

   ________________________________________________________________
   ________________________________________________________________

4. How many different ways are there to ride your bike from (2, 3) to (3, 4) if you do not backtrack?

5. How many different ways are there to ride your bike from (2, 3) to (4, 5) if you do not backtrack?

6. What strategy did you use to solve question #5?
Map Coordinates Answer Sheet:

1. You are waiting at the Taxi Stand. Someone just called from the post office and wants a ride.
   a. How many blocks forward would you drive from the taxi stand on your way to the post office?  __2 blocks__.
   b. You will need to turn left to get to the post office. What street will you turn left on?  _W Street__
   c. After turning left, how many more blocks will you need to drive to get to the post office?  _1 block__

   **Great Job!** You just picked up your first passenger! 😊

2. While you are waiting for another call at the Taxi Stand you study the map. Find the coordinates for…

   - The Library  _**(4,5)**__  
   - Book Store  _**(5,4)**__  
   - Grocery Store  _**(3,3)**__  
   - Post Office  _**(2,1)**__  
   - Taxi Stand  _**(0,0)**__

3. Suppose you were at the Post Office and received a call to pick up someone at the book store. Describe one way to get to there.  __________ (Various answers apply) __ for example:  

   __Go east on B Street for 3 blocks, then turn left and go north on Z Street for 3 blocks._

4. How many different ways are there to ride your bike from (2,3)  to  (3, 4) if you do not backtrack?  _2__

5. How many different ways can you find to ride your bike from (2,3)  to  (4,5) if you do not backtrack?  _(answers will vary)_
Print out on cardstock to use as a taxi if needed:
Nonrenewable Resources
Matching Game and Mining for Chocolate
by Karen Adams

Teacher Planning Information

Overview: These activities provide practice with abstract and quantitative reasoning. Families will play a matching game and “Mine for Chocolate.” In Activity #1, families will identify, match and observe pictures of mineral mines used to make everyday items. In Activity #2, families will extract or “Mine for Chocolate” from chocolate chip cookies. The activities will provide practice in observing, estimating, counting, graphing, and categorizing. Discussion and reflection questions are provided to help make connections between how our use of nonrenewable resources have an impact upon the environment.

Objectives: In completing this activity, students should be able to:
- Match everyday items with the minerals from which they are made.
- Practice abstract and quantitative reasoning skills.
- Make observations and estimations.
- Discuss the challenges and difficulties of mining minerals from the earth.
- Describe how mining operations can affect the land.

Oregon Common Core State Standards for Math:
4.MP.1 Make sense of problems and persevere in solving them.; 4.MP.2 Reason abstractly and quantitatively. 4.MP.3 Construct viable arguments and critique the reasoning of others.; 4.MP.5 Use appropriate tools strategically.

National Geography Standards:
Standard 14: How human actions modify the physical environment.
Standard 15: How physical systems affect human systems.

Grades: K – 4 Time: 15 - 20 minutes (for each activity)

Materials:
Activity #1: Each family will need…
- Picture cards (page 5, 6 & 7), of items and minerals, (use cardstock if possible and place cards in a zip-lock baggie)
- Print out the questions for discussion sheet (page 4)
- Instructions for memory matching game (page 3)

Activity #2: (Except for the print-outs, the supplies can be put in a zip-lock baggie ahead of time)
- Chips Ahoy Chocolate Chip Cookies - Crunchy Style (one per family)
  o Optional: Extra cookies for family to eat after the activity is complete
- Copy of (Activity #2 – Instruction sheet (page 4 - full sheet)
- Copy of Chocolate graphing (page 10)
- Paper towels
- Crayons and pencils
- Tweezers and toothpicks
Background Information:

Many of the products we use every day (e.g., pencils, crayons, soap, gasoline, tools, soda cans) are made from minerals that are mined or extracted from the earth. There is only a set amount of each mineral in the Earth and once it is used up it will be gone forever. These minerals are called non-renewable resources.

As the human population grows, the demand for these resources grows as well. Minerals and resources are mined from the earth to meet the wants and needs of humans.

Large-scale mining operations can damage the land. Unfortunately, the end result of mining (the profits made by selling the minerals) can at times overshadow the damage done by the process (destroyed animal habitat, plant habitat, pollution of streams, etc.).

Key Vocabulary: Mining, Extracting, Mines, Minerals, Resources, Nonrenewable, Graph, Estimate, Array, Rows, Columns, Smaller, Smallest, Categories
Activity Steps: Family Instruction Sheets

Activity # 1 – Matching Game Instructions

1. Place all 16 cards face down in an array of rows and columns
2. Work together or take turns trying to match item cards by turning two cards over at a time and reading each one.
3. If the two cards do not match, turn them back over and try again until you have a match.
4. If the cards match, place them on top of the picture of the correct mineral mine.
5. Continue until all the cards have a match and are placed on corresponding picture of the mineral mine.
6. Use the pictures of the mineral mines to answer and discuss the “Matching Game Discussion Questions” (page 4).

Great Work! Now you can move on to Activity # 2

Activity #2: Mining for Chocolate Instructions

1. Place a cookie on the paper towel
2. Talk about and make observations about the cookie (what does it looks like, what’s the shape, texture, etc.)
3. Make a guess or estimate the approximate amount of big chocolate pieces that you think are in the cookie.
4. Take turns or work together to Extract (or mine) the chocolate pieces out of the cookie using tweezers and a toothpick.
5. Place each chocolate piece on the graph as you extract them, choosing the correct column (Big, Smaller or The Smallest).
6. Count and color in the boxes on the graph (one box for each piece of chocolate).
7. Answer or discuss the questions that are next to the graph.

Fantastic job! Now you can eat your cookies
Activity # 1  (Matching Game – Mining for Minerals / Pictures)

Matching Game: Discussion Questions

1. What items do you use every day?

2. What items do you use the most?

3. Which mineral is needed to make the items that you use the most?

4. Looking at the pictures of the mineral mines, what do you notice?

5. What happens to the land when minerals are extracted?

6. Why do you think these minerals are called, “Nonrenewable resources”?

7. What will happen once all the resources are gone or have been mined from the Earth? What do you think we should do now to prepare?
**Activity #1 (Matching Game)**

<table>
<thead>
<tr>
<th>Soup Cans</th>
<th>Soup Cans</th>
<th>Pencils</th>
<th>Pencils</th>
</tr>
</thead>
<tbody>
<tr>
<td>are made from Tin.</td>
<td>are made from Graphite.</td>
<td>are made from Copper.</td>
<td>are made from aluminum.</td>
</tr>
<tr>
<td><strong>Pennies</strong></td>
<td><strong>Pennies</strong></td>
<td><strong>Soda cans</strong></td>
<td><strong>Soda cans</strong></td>
</tr>
<tr>
<td>are made from Copper.</td>
<td></td>
<td>are made from aluminum.</td>
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<tr>
<td>Tools</td>
<td>Gasoline</td>
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<td></td>
<td></td>
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<tr>
<td>are made from Iron.</td>
<td>is made from Oil.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Soap</th>
<th>Flatware</th>
</tr>
</thead>
<tbody>
<tr>
<td>is made from Talc.</td>
<td>is made from Silver.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Tools</th>
<th>Gasoline</th>
<th>Flatware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talc mine</td>
<td>Iron mine</td>
<td>Tin mine</td>
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<tr>
<td>-----------</td>
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<td>----------</td>
</tr>
<tr>
<td>Copper mine</td>
<td>Aluminum mine</td>
<td>Graphite mine</td>
</tr>
</tbody>
</table>
Activity # 2: Instruction Sheet: (Observing, estimating, counting and graphing)

1. Place one cookie on a paper towel. Observe the cookie. What does it look like? What shape is it?

2. Estimate how many big chocolate chips are in the cookie. (fill in the blank)

We estimate that there are __________ big chocolate pieces in our cookie.

2. Use the tweezers and toothpicks to “mine or extract” the chocolate chips from the cookie.

3. Place each piece of chocolate in one of three categories on the chocolate graphing worksheet.
   (Big / whole or almost whole pieces of chocolate)
   (Smaller / partly broken pieces of chocolate)
   (The smallest / tiny pieces of chocolate)

4. Count each category of chocolate on your graph. Color in each square of the graph that has a piece of chocolate on it.

5. Discuss the questions (page 9). Look at your cookie after the chocolate is extracted. What connections can you make between mining chocolate from your cookie and mining for nonrenewable minerals? What does the cookie look like now? What are the positive and negative results of mining the Earth’s natural resources?
Use (page 10) to graph chocolate pieces according to size. Color in each box that has a piece of chocolate in it. Answer the questions below.

1. We estimated that there would be _______ big pieces of chocolate in our cookie.

2. We extracted _______ big pieces from our cookie.

3. Our estimate was High or Low by _______ pieces.

4. How many pieces were broken? ________

5. How many pieces were tiny? ____________________

6. What size does your graph show had the most pieces?

   Circle one: Big Smaller The Smallest

7. What does your cookie look like now?

   ____________________________________________

   _______________________________________________

   ______

8. What happened to your cookie? ________________________________

   ____________________________________________

   ______

**Closing discussion questions:**

What happened to the cookie as you mined the chocolate?

What connections can you make between mining chocolate from your cookie and mining for nonrenewable minerals?

What does the cookie look like now?

Discuss and list some of the positive and negative results of mining the Earth’s natural resources?

**Positives:** (+)  
**Negatives:** (-)
<table>
<thead>
<tr>
<th></th>
<th>Big (whole or almost whole pieces of chocolate)</th>
<th>Smaller (slightly or partly broken pieces of chocolate)</th>
<th>The Smallest (tiny broken pieces of chocolate)</th>
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</thead>
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</tbody>
</table>
Overview: This activity is designed to help students learn to compare numbers and dates within the context of Oregon county information.

Objectives: In completing this activity, students should be able to:
- Make mathematic comparisons of population and rainfall percentages
- Make chronologic comparisons of dates
- Guess how the physical geography of Oregon relates to the amount of rainfall throughout the state

Oregon Common Core State Standards for Math: 2. NBT 3, 3.NBT 2, 4.MD 2

Oregon Geography Content Standards: K7, 1.11, 2.9, 3.10, 3.11, 4.10

Grades: 2-4

Time: 15 minutes

Materials:
- Red, yellow, and green markers (crayons, highlighters, or colored pencils will also work)
- Writing utensil (pencils or pens)
- County population, county precipitation, and county date established maps (included)
- Questions sheet (provided)

Activity set up: Print out enough of the County Population, County Precipitation, and County Date Established maps as well as the Questions sheet for each participant. Every participant should have one of each color marker, plus a writing utensil. Print out at least one copy of the How to do this Activity sheet to post for everyone to use.
How to do this activity

Step 1.
Take one of each of the three maps of Oregon and its counties, *Average Annual Precipitation by County*, *Date Established of Oregon Counties*, and *Oregon Population by County*.

Step 2.
At the bottom there is a guide, called a *Legend*, which tells you a number or date range. Look at the legend on each map, and see what the different colors represent.

Step 3.
Take a green marker, a yellow marker, and a red marker. Find the counties that fit between the ranges shown in the Legend, and color them to match.

Step 4.
Take one of the *Questions* sheets, and fill it out, referring back to the three county maps.
Average Annual Precipitation by County (2013)

- Precipitation Between 0 - 15 inches
- Precipitation Between 15 - 45 inches
- Precipitation Over 45 inches
Questions

Which county gets the most rain in inches? Which county gets the least amount of rain? Why do you think this is?

County with the most rain: _______________________
County with the least rain: _______________________

Which county has the largest population? Which county has the smallest population? Why do you think this is?

County with the largest population: _______________________
County with the smallest population: _______________________

Which county is the oldest in Oregon? Which county is the newest?

Oldest county: _______________________
Newest county: _______________________
Plan a Road Trip on U.S Interstates
by Shawnti Peachey

Teacher Planning Information

Overview: Using basic maps of the U.S. cities and interstates, students will plan road trips on U.S. Interstates while calculating distance (mileage) and time (hours/days).

Objectives: In completing this activity the student should be able to:
● Understand that odd numbered interstates run N/S and that even numbered interstates run W/E.
● Understand road-trip terminology such as interstate, freeway, one-way, pit stop, cross-country, and round-trip.
● Calculate distance and time of a road trip.
● Convert miles to hours.
● Convert hours to days.

Oregon Common Core for Math:
3.MD.G Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.

Oregon Geographic Content Standards:
3.8 Identify links of land, regions, river systems, and interstate highways between Oregon and other states.

Grade: 3-5

Time: 15-20 minutes

Materials:
● Pencils/Pens (15)
● Copies of maps (Do NOT change the scale of the map, colored copies not necessary but helpful if possible).
  o Page 5 (5 copies)
  o Page 6 (10 copies)
  o Page 7 (5 copies)
  o Page 8 (5 copies)

NOTE: Cut out the quarter maps from pages 7-8 and tape them together to make a larger map.
• Page 9 (2-3 copies) Do NOT change the scale of the rulers. Cut out the rulers, they are small but they are made to scale. If possible, print them on cardstock paper to make them sturdier.

• Pages 10-13 **Travel Card Pages** (1 copy of each page) Again, color copies not necessary but helpful for students. Cut out travel cards on dotted line.

• Pages 14-17 **Trip Calculator Worksheets** (enough copies so every student can have a minimum of 1 worksheet) **Note:** some students may do more than 1 worksheet, and many students will only do the **One Way Short Trip** Worksheet.
  ○ If you are unsure how many worksheets to print here is the suggested number:
    ○ **One Way Short Trip** Calculator Worksheet (30 copies)
    ○ **Cross Country Trip** Calculator Worksheet (20 copies)
    ○ **One-Way with Pit Stop City Trip** Calculator Worksheet (20 copies)
    ○ **Round Trip Challenge** Calculator Worksheet (10 copies)

**Sources:**
How to do this activity

1. Work through the **Background Information** Page, answer the questions and discuss the vocabulary included on the sheet.
2. Make sure you read the **Fun Facts** at the bottom of the Background Information Page.
3. Look at and familiarize yourself with the **three different maps** of the United States
   - U.S. Interstates Map
   - U.S. Major Cities Map
   - U.S. Interstates and Major Cities Map
4. Look at and familiarize yourself with the **distance rulers** provided at the table (they are mini, but they are made to scale).

**Activity Directions:**

5. Draw one **Travel Card** at a time. Find a blank Trip Calculator Worksheet that matched your travel card.
6. Map a route on U.S. Interstates using the cities provided on the travel card. You will have to use the U.S. Interstates & Major Cities Map and your ruler.
7. Notice that the travel cards have different difficulty levels. As you get comfortable mapping the **One-Way Short Trip** travel cards, move on to the next level. Here are the levels in order of difficulty:
   - One-Way Short Trip
   - Cross-Country
   - One-Way with Pit Stop City
   - Regional Round Trip Challenge Card
Background Information Sheet

As a group consider and discuss the following questions:

1. Have you ever traveled on an interstate/freeway?
2. If so, what was your starting point? What was your ending point?
3. Have you ever traveled outside of Oregon? If so, where did you go?
4. Can you drive to Hawaii?
5. Can you drive to Alaska?

Definitions:

- Interstate (inter-state): between states
- Freeway: a wide highway that is built for fast travel often “free” from traffic lights, stop signs, or tolls
- One-Way Trip: travel to a place but not back from the place
- Cross Country Trip: extending or moving across an entire country
  - Example: Portland to Washington D.C.
- Pit Stop: a short stop during a journey for rest or food or to use a bathroom
- Round Trip: a trip to a place and back often over the same or different routes

Fun Facts:

Interstate 5 5 is the interstate that runs North and South through Oregon
Interstate 84 84 is the interstate that runs West and East through Oregon
Odd numbered Interstates always run North and South
Even numbered Interstates always run West and East
Map of U.S. Interstates
(Not including Alaska & Hawaii)

Map of U.S. Major Cities
Rulers for Measurements

Rulers from map:

Rulers for measuring distance:
<table>
<thead>
<tr>
<th>One-Way Short Trip</th>
<th>One-Way Short Trip</th>
</tr>
</thead>
</table>
| City of Departure: *Portland, Oregon*  
City of Arrival: *Houston, Texas*  | City of Departure: *Chicago, Illinois*  
City of Arrival: *Baton Rouge, Louisiana* |
| City of Departure: *Oklahoma City, Oklahoma*  
City of Arrival: *Los Angeles, California*  | City of Departure: *New York City, New York*  
City of Arrival: *Chicago, Illinois* |
| City of Departure: *Portland, Oregon*  
City of Arrival: *Seattle, Washington*  | City of Departure: *Fargo, North Dakota*  
City of Arrival: *Kansas City, Kansas* |
| City of Departure: *Nashville, Tennessee*  
City of Arrival: *Tucson, Arizona*  | City of Departure: *San Francisco, California*  
City of Arrival: *Denver, Colorado* |
| City of Departure: *Seattle, Washington*  
City of Arrival: *Los Angeles, California*  | City of Departure: *Dallas, Texas*  
City of Arrival: *Atlanta, Georgia* |
<table>
<thead>
<tr>
<th>Cross Country</th>
<th>Cross Country</th>
</tr>
</thead>
</table>
| City of Departure: *Portland, Oregon*  
City of Arrival: *Orlando, Florida* | City of Departure: *Seattle, Washington*  
City of Arrival: *New York City, New York* |
| City of Departure: *Columbia, South Carolina*  
City of Arrival: *Los Angeles, California* | City of Departure: *Augusta, Maine*  
City of Arrival: *Portland, Oregon* |
| City of Departure: *Miami, Florida*  
City of Arrival: *Seattle, Washington* | City of Departure: *Washington D.C.*  
City of Arrival: *San Francisco, California* |
<table>
<thead>
<tr>
<th>Route</th>
<th>Departure</th>
<th>Pit Stop</th>
<th>Arrival</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>New York</td>
<td>Chicago</td>
<td>Denver</td>
</tr>
<tr>
<td>2.</td>
<td>Albuquerque</td>
<td>Denver</td>
<td>Seattle</td>
</tr>
<tr>
<td>3.</td>
<td>Philadelphia</td>
<td>Des Moines</td>
<td>Dallas</td>
</tr>
<tr>
<td>4.</td>
<td>Minneapolis</td>
<td>Cheyenne</td>
<td>El Paso</td>
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<tr>
<td>5.</td>
<td>Los Angeles</td>
<td>Salt Lake City</td>
<td>Seattle</td>
</tr>
</tbody>
</table>
Travel Cards: **Round Trip**

**Challenge Card**  
**Western Round Trip**  
City of Departure/Arrival: *Portland*  
Travel Through #1: *Los Angeles*  
Travel Through #2: *Las Vegas*  
Travel Through #3: *Salt Lake City*  
Travel Through #4: *Boise*  
Arrival Back to: *Portland*

**Challenge Card**  
**Eastern Round Trip**  
City of Departure/Arrival: *Washington D.C.*  
Travel Through #1: *Philadelphia*  
Travel Through #2: *Charleston*  
Travel Through #3: *Columbia*  
Arrival Back to: *Washington D.C.*

**Challenge Card**  
**Mid-West Round Trip**  
City of Departure/Arrival: *Chicago*  
Travel Through #1: *Des Moines*  
Travel Through #2: *Kansas City*  
Arrival Back to: *Chicago*

**Challenge Card**  
**New England Round Trip**  
City of Departure/Arrival: *Augusta*  
Travel Through #1: *Boston*  
Travel Through #2: *Niagara Falls*  
Arrival Back to: *Augusta*

**Challenge Card**  
**The South Round Trip**  
City of Departure/Arrival: *Dallas*  
Travel Through #1: *Jackson*  
Travel Through #2: *New Orleans*  
Travel Through #3: *El Paso*  
Arrival Back to: *Dallas*

**Extra Challenge Card**  
**Entire Country Round Trip**  
City of Departure/Arrival: *Portland*  
Travel Through #1: *Chicago*  
Travel Through #2: *New York City*  
Travel Through #3: *Jacksonville*  
Travel Through #4: *Houston*  
Travel Through #5: *Phoenix*  
Travel Through #6: *Los Angeles*  
Arrival Back to: *Portland*
**One-Way Short Trip Calculator Worksheet**

City of Departure_____________________________________

City of Arrival_______________________________________

List of **Interstates** driven on: (There might only be 1 Interstate)

<table>
<thead>
<tr>
<th>Interstate</th>
<th>Even or Odd Number?</th>
<th>North/South or East/West?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>2.</td>
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<tr>
<td>3.</td>
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</tbody>
</table>

*Use the distance ruler to measure:*
**Total distance** (in miles)__________________________

*Use the conversion 60 miles/1 hour to calculate:*
**Total time driving** (in hours)_______________________

*Use the conversion 24 hours/1 day to calculate:*
**Total days of travel** (convert hours to days)_________
Cross Country Trip Calculator Worksheet

City of Departure_______________________________

City of Arrival_______________________________

List of Interstates driven on: (There might be more than 5 Interstates)

<table>
<thead>
<tr>
<th>Interstate</th>
<th>Even or Odd Number?</th>
<th>North/South or East/West?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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</tbody>
</table>

Use the distance ruler to measure:
Total distance (in miles)__________________________

Use the conversion 60 miles/1 hour to calculate:
Total time driving (in hours)_______________________

Use the conversion 24 hours/1 day to calculate:
Total days of travel (convert hours to days)_________

How would your total days of travel change if you were to stop to rest overnight for 10 hours every day?
One-Way with Pit Stop City Trip Calculator Worksheet

City of **Departure**__________________________
Travel Through/Pit stop City_____________________
City of **Arrival**______________________________

List of **Interstates** driven on: (There might be more than 7 Interstates)

<table>
<thead>
<tr>
<th>Interstate</th>
<th>Even or Odd Number?</th>
<th>North/South or East/West?</th>
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</thead>
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<td>7.</td>
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</tbody>
</table>

*Use the distance ruler to measure:*
**Total distance** (in miles)______________________________

*Use the conversion 60 miles/1 hour to calculate:*
**Total time driving** (in hours)__________________________

*Use the conversion 24 hours/1 day to calculate:*
**Total days of travel** (convert hours to days)___________
Round Trip Challenge Calculator Worksheet

City of **Departure**

Travel Through:

#1________________ #2________________ #3________________
#4________________ #5________________ #6________________

Back to city of ______________________ (Arrival)

List of **Interstates** driven on: (There might be more than 7 Interstates)

<table>
<thead>
<tr>
<th>Interstate</th>
<th>Even or Odd Number?</th>
<th>North/South or East/West Direction?</th>
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<tbody>
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</table>

*Use the distance ruler to measure:*

**Total distance** (in miles)__________________________

*Use the conversion 60 miles/1 hour to calculate:*

**Total time driving** (in hours)__________________________

*Use the conversion 24 hours/1 day to calculate:*

**Total days of travel** (convert hours to days)___________
Population Density and Graphing
by Shawnti Peachey

Teacher Planning Information

Overview: This activity is designed to give students an understanding of population density for different countries.

Objectives: In completing this activity the student should be able to:
- Understand the difference between a total population and population density of a country.
- Draw a bar graph to represent the population and population density of two countries.
- Consider what problems may arise due to overpopulation.

Oregon Common Core for Math:
6.RP.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
7.RP.2 Recognize and represent proportional relationships between quantities.
8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.

Oregon Geographic Content Standards:
6.12 Collect and analyze data to describe regions of the Western Hemisphere.
7.12 Compare and analyze human characteristics (e.g. population, land use, language, and religion) of places and regions in the Eastern Hemisphere.
8.10 Interpret maps to identify growth and development of the United States.

Grade: 6-8

Time: 20 Minutes

Materials:
- Colored Pencils
- Regular Pencils
- Copies of the following:
  - World Population Density Map (2-3 copies)
  - Countries of the World Maps (2-3 copies of each continent map)
    - North America Map
    - Europe Map
    - Africa Map
- South America Map
- Asia Map
  - Table #1 Top 20 Most Populous Countries" (2-3 copies)
  - Table #2 Other Various Countries & Population (2-3 copies)
  - Background Information (2-3 copies)
  - Making Graphs Activity Packet (print two-sided copies and make into a stapled packet – one per participant)

**Important notes for making copies**

If you have access at your library to an atlas of the world for the students to use during this activity, that would be ideal. If so, you do NOT need to make copies of the maps in this lesson. If you do not have access to a hard copy atlas of the world, underneath every map image there is the online link to follow to print directly from website for a larger and clearer image.

**Sources:**
Population density map [http://i.imgur.com/gBYMfWO.jpg](http://i.imgur.com/gBYMfWO.jpg)
Population geography definitions [http://swc2.hccs.edu/geography/PopGeo.html](http://swc2.hccs.edu/geography/PopGeo.html)
How To Do This Activity

Read the **Background Information**.

Familiarize yourself with the following **Maps & Tables**:
1. World Population Density Map
2. Countries of the World Map
3. Table #1 Top 20 Most Populous Countries
4. Table #2 Other Various Countries and Population

Individually or in groups, work through the **Making Graphs Activity**. Answer the questions after completing each graph. There are three sections to this activity.
1. Graphing the Population by Political Boundaries
2. Graphing the Land Area
3. Graphing Population Density

**Group Discussion**: After completing the three Activities, as a group consider and discuss what problems may arise due to overpopulation of a country and of the world.
Background Information

**Population:** The total number of people living in a country or region.

**Population Density:** The number of people per square mile or kilometer, usually takes into account the total population of a country or region and the total area. This can vary dramatically within a state. For example: the density figures for the city of Tokyo versus all of Japan.

**Overpopulation:** The condition of having a population so dense as to enable the quick spread of disease, environmental deterioration, lack of adequate resources to survive, and overall impaired quality of life.

**Political Boundaries:** A boundary line drawn between two countries. This is not necessarily a *physical boundary*, however political boundaries are often drawn in parallel to physical boundaries. For Example: The United States West and East Coast political boundaries are parallel to the Pacific and Atlantic Ocean’s physical boundaries. However, the United States’ Northern Boundary that separates it from Canada is purely a political boundary because it does not run parallel to any physical landmarks.
## Population by Country

### Table #1: Top 20 Most Populous Countries

<table>
<thead>
<tr>
<th>Rank Number</th>
<th>Country</th>
<th>Continent</th>
<th>Population</th>
<th>Population Density (people/sq. mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Earth</td>
<td></td>
<td>7,349,000,000</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>China</td>
<td>Asia</td>
<td>1,367,820,000</td>
<td>146</td>
</tr>
<tr>
<td>2</td>
<td>India</td>
<td>Asia</td>
<td>1,282,000,000</td>
<td>441</td>
</tr>
<tr>
<td>3</td>
<td>United States</td>
<td>N. America</td>
<td>322,000,000</td>
<td>35</td>
</tr>
<tr>
<td>4</td>
<td>Indonesia</td>
<td>S. Asia</td>
<td>258,705,000</td>
<td>142</td>
</tr>
<tr>
<td>5</td>
<td>Brazil</td>
<td>S. America</td>
<td>205,270,000</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>Pakistan</td>
<td>Asia</td>
<td>188,144,000</td>
<td>245</td>
</tr>
<tr>
<td>7</td>
<td>Nigeria</td>
<td>Africa</td>
<td>183,500,000</td>
<td>200</td>
</tr>
<tr>
<td>8</td>
<td>Bangladesh</td>
<td>Asia</td>
<td>158,226,710</td>
<td>1,237</td>
</tr>
<tr>
<td>9</td>
<td>Russia</td>
<td>Europe &amp; Asia</td>
<td>146,544,000</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>Japan</td>
<td>Asia</td>
<td>126,920,000</td>
<td>348</td>
</tr>
<tr>
<td>11</td>
<td>Mexico</td>
<td>C. America</td>
<td>122,300,000</td>
<td>65</td>
</tr>
<tr>
<td>12</td>
<td>Philippines</td>
<td>Asia</td>
<td>100,981,000</td>
<td>338</td>
</tr>
<tr>
<td>13</td>
<td>Vietnam</td>
<td>Asia</td>
<td>90,730,000</td>
<td>296</td>
</tr>
<tr>
<td>14</td>
<td>Egypt</td>
<td>Africa</td>
<td>90,125,000</td>
<td>92</td>
</tr>
<tr>
<td>15</td>
<td>Ethiopia</td>
<td>Africa</td>
<td>90,000,000</td>
<td>99</td>
</tr>
<tr>
<td>16</td>
<td>Germany</td>
<td>Europe</td>
<td>81,771,000</td>
<td>234</td>
</tr>
<tr>
<td>17</td>
<td>Turkey</td>
<td>Europe</td>
<td>78,741,000</td>
<td>102</td>
</tr>
<tr>
<td>18</td>
<td>Iran</td>
<td>Asia</td>
<td>78,226,000</td>
<td>49</td>
</tr>
<tr>
<td>19</td>
<td>Congo, DROC</td>
<td>Africa</td>
<td>71,200,000</td>
<td>34</td>
</tr>
<tr>
<td>20</td>
<td>Thailand</td>
<td>Asia</td>
<td>67,959,000</td>
<td>133</td>
</tr>
<tr>
<td>Rank Number</td>
<td>Country</td>
<td>Continent</td>
<td>Population</td>
<td>Population Density (people/sq. mile)</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------</td>
<td>-----------</td>
<td>------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>26</td>
<td>South Korea</td>
<td>Asia</td>
<td>51,360,000</td>
<td>519</td>
</tr>
<tr>
<td>52</td>
<td>Australia</td>
<td>Oceania</td>
<td>24,129,000</td>
<td>3</td>
</tr>
<tr>
<td>57</td>
<td>Sri Lanka</td>
<td>Asia</td>
<td>20,675,000</td>
<td>334</td>
</tr>
<tr>
<td>67</td>
<td>Guatemala</td>
<td>C. America</td>
<td>15,806,675</td>
<td>153</td>
</tr>
<tr>
<td>69</td>
<td>Senegal</td>
<td>Africa</td>
<td>14,800,000</td>
<td>79</td>
</tr>
<tr>
<td>77</td>
<td>Rwanda</td>
<td>Africa</td>
<td>11,000,000</td>
<td>471</td>
</tr>
<tr>
<td>84</td>
<td>Haiti</td>
<td>Caribbean</td>
<td>10,085,000</td>
<td>389</td>
</tr>
<tr>
<td>87</td>
<td>Hungary</td>
<td>Europe</td>
<td>9,849,000</td>
<td>109</td>
</tr>
<tr>
<td>97</td>
<td>Israel</td>
<td>Middle East</td>
<td>8,300,000</td>
<td>387</td>
</tr>
<tr>
<td>113</td>
<td>Denmark</td>
<td>Europe</td>
<td>5,669,000</td>
<td>134</td>
</tr>
<tr>
<td>121</td>
<td>New Zealand</td>
<td>Oceania</td>
<td>4,675,000</td>
<td>17</td>
</tr>
<tr>
<td>141</td>
<td>Jamaica</td>
<td>Caribbean</td>
<td>2,740</td>
<td>252</td>
</tr>
<tr>
<td>143</td>
<td>Namibia</td>
<td>Africa</td>
<td>2,100,000</td>
<td>3</td>
</tr>
<tr>
<td>152</td>
<td>Estonia</td>
<td>Europe</td>
<td>1,313,000</td>
<td>31</td>
</tr>
<tr>
<td>155</td>
<td>Bahrain</td>
<td>Middle East</td>
<td>1,234,000</td>
<td>1,789</td>
</tr>
<tr>
<td>156</td>
<td>Swaziland</td>
<td>Africa</td>
<td>1,186,000</td>
<td>75</td>
</tr>
<tr>
<td>160</td>
<td>Djibouti</td>
<td>Africa</td>
<td>818,000</td>
<td>38</td>
</tr>
<tr>
<td>171</td>
<td>Suriname</td>
<td>America</td>
<td>540,000</td>
<td>3</td>
</tr>
<tr>
<td>177</td>
<td>Bahamas</td>
<td>Caribbean</td>
<td>370,000</td>
<td>39</td>
</tr>
<tr>
<td>178</td>
<td>Belize</td>
<td>America</td>
<td>361,000</td>
<td>16</td>
</tr>
<tr>
<td>205</td>
<td>Greenland</td>
<td>Atlantic</td>
<td>56,186</td>
<td>0.1</td>
</tr>
</tbody>
</table>
Making Graphs Activity

1) Graphing the Population by Political Boundaries
Population of the United States = 298,444,295
Population of Bangladesh = 153,546,901

Make a double bar graph to show the population of both countries.

In what ways are these populations similar or different?
2) Graphing the Land Area
Land Area of United States = 3,539,225 square miles
Land Area of Bangladesh = 51,703 square miles

Make a double bar graph to show the land area of both countries.

Is the land area of these 2 countries similar or different?

Why do the similarities or differences in land area matter when we consider the amount of people (population) living in each country?
3) Graphing Population Density
Each of the following squares represents 1 square mile. Your task is to draw one “X” for each person, and they must all fit inside the square.

For example: The density per square mile of New Zealand is 15 people/square mile. I have drawn in 15 “X’s” into the following box.

Does the population density indicate that the entire population is distributed evenly throughout the country?
Country_________________. Density per square mile________________.

Country_________________. Density per square mile________________.
Countries of the World Maps

Source: http://www.worldatlas.com/webimage/countrys/nalargez.htm
Population Pyramids

Teacher planning information

Overview: This activity is designed to help students visualize population through population pyramids.

Objectives:
- Understand the concept of population pyramids
- Create two population pyramids of Oregon counties
- Compare and contrast the two county pyramids

Oregon Common Core State Standards for Math: 2.MD 10, 3.MD 3, 4.MD 4

Oregon Geography Content Standards: 2.9, 3.7, 4.10

Grades: 2-4

Time: 15 minutes

Materials:
- Writing utensils (pens or pencils)
- Two different colored markers (can be markers, crayons, etc.)
- Lane County Pyramid sheet (included)
- Lane County Statistics sheet (included)
- Multnomah County Pyramid sheet (included)
- Multnomah County Statistics sheet (included)
- What is a Population Pyramid sheet (included)
- Questions sheet (included)
- Rulers (optional; for students to mark percentages)

Activity set up: Print out enough of both the Lane County and Multnomah County Statistics and Pyramid sheets for each participant, as well as the Questions sheet. Every participant should have a writing utensil and two different colored markers. Print out at least one copy of the What is a Population Pyramid, and How to do this Activity sheets to post for everyone to use.
A population pyramid (also known as an age-sex graph) is a special type of graph that shows the distribution of a location’s population in terms of age groups, called *cohorts*, and sex. We use percentages rather than numbers when constructing population pyramids because this allows us to compare countries with different population sizes.
How to do this activity

Step 1.
Read about what a population pyramid is. Have you heard of this before?

Step 2.
Take a writing utensil, and one each of the Multnomah County Statistics and Pyramid sheets, and the Lane County Statistics and Pyramid sheets.

Step 3.
Read the statistics for one of the counties, and mark on the population pyramid sheet (for that same county) the percentage.

Step 4.
Once you have marked on the population pyramid the percentages, color each side in with a different colored marker.

Step 5.
Repeat this process for the other county so you have two population pyramids.

Step 6.
Take a Questions sheet, and use your pyramids and statistics to answer the questions.
## Multnomah County Pyramid

<table>
<thead>
<tr>
<th>Ages</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>80+ years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70-79 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-69 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50-59 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-49 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-39 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-19 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-9 years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Percent

<table>
<thead>
<tr>
<th>18</th>
<th>15</th>
<th>12</th>
<th>9</th>
<th>6</th>
<th>3</th>
<th>1</th>
<th>0</th>
<th>1</th>
<th>3</th>
<th>6</th>
<th>8</th>
<th>12</th>
<th>15</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>15</td>
<td>12</td>
<td>9</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>8</td>
<td>12</td>
<td>15</td>
<td>18</td>
</tr>
</tbody>
</table>
## Multnomah County Statistics

<table>
<thead>
<tr>
<th>Age</th>
<th>Both Sexes Population</th>
<th>Male Population</th>
<th>Female Population</th>
<th>Percent Both Sexes</th>
<th>Percent Male</th>
<th>Percent Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL:</td>
<td>735,334</td>
<td>363,645</td>
<td>371,689</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>80+ years</td>
<td>23,650</td>
<td>8,174</td>
<td>15,478</td>
<td>3.2%</td>
<td>2.2%</td>
<td>4.1%</td>
</tr>
<tr>
<td>70-79 years</td>
<td>29,137</td>
<td>12,712</td>
<td>16,425</td>
<td>3.9%</td>
<td>3.5%</td>
<td>4.4%</td>
</tr>
<tr>
<td>60-69 years</td>
<td>63,550</td>
<td>30,732</td>
<td>32,818</td>
<td>8.7%</td>
<td>8.4%</td>
<td>8.8%</td>
</tr>
<tr>
<td>50-59 years</td>
<td>98,627</td>
<td>48,846</td>
<td>49,781</td>
<td>13.4%</td>
<td>13.4%</td>
<td>13.3%</td>
</tr>
<tr>
<td>40-49 years</td>
<td>102,324</td>
<td>52,599</td>
<td>49,725</td>
<td>13.9%</td>
<td>14.5%</td>
<td>13.3%</td>
</tr>
<tr>
<td>30-39 years</td>
<td>126,139</td>
<td>64,412</td>
<td>61,727</td>
<td>17.1%</td>
<td>17.7%</td>
<td>16.6%</td>
</tr>
<tr>
<td>20-29 years</td>
<td>123,046</td>
<td>60,196</td>
<td>62,850</td>
<td>16.8%</td>
<td>16.5%</td>
<td>16.9%</td>
</tr>
<tr>
<td>10-19 years</td>
<td>80,513</td>
<td>40,866</td>
<td>39,647</td>
<td>10.9%</td>
<td>11.2%</td>
<td>10.6%</td>
</tr>
<tr>
<td>0-9 years</td>
<td>88,348</td>
<td>45,110</td>
<td>43,238</td>
<td>12%</td>
<td>12.4%</td>
<td>11.6%</td>
</tr>
</tbody>
</table>
## Lane County Statistics

<table>
<thead>
<tr>
<th>Age</th>
<th>Both Sexes Population</th>
<th>Male Population</th>
<th>Female Population</th>
<th>Percent Both Sexes</th>
<th>Percent Male</th>
<th>Percent Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL:</td>
<td>351,715</td>
<td>173,044</td>
<td>178,671</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>80+ years</td>
<td>15,530</td>
<td>5,845</td>
<td>9,685</td>
<td>4.5%</td>
<td>1.7%</td>
<td>2.8%</td>
</tr>
<tr>
<td>70-79 years</td>
<td>20,769</td>
<td>9,697</td>
<td>11,072</td>
<td>5.9%</td>
<td>2.8%</td>
<td>3.2%</td>
</tr>
<tr>
<td>60-69 years</td>
<td>39,741</td>
<td>19,342</td>
<td>20,399</td>
<td>11.3%</td>
<td>5.5%</td>
<td>5.8%</td>
</tr>
<tr>
<td>50-59 years</td>
<td>52,067</td>
<td>24,826</td>
<td>27,241</td>
<td>14.8%</td>
<td>7%</td>
<td>7.8%</td>
</tr>
<tr>
<td>40-49 years</td>
<td>43,450</td>
<td>21,417</td>
<td>22,033</td>
<td>12.3%</td>
<td>6.1%</td>
<td>6.2%</td>
</tr>
<tr>
<td>30-39 years</td>
<td>42,095</td>
<td>21,446</td>
<td>20,649</td>
<td>11.9%</td>
<td>6.1%</td>
<td>5.8%</td>
</tr>
<tr>
<td>20-29 years</td>
<td>55,242</td>
<td>28,239</td>
<td>27,003</td>
<td>15.7%</td>
<td>8.1%</td>
<td>7.7%</td>
</tr>
<tr>
<td>10-19 years</td>
<td>45,664</td>
<td>23,219</td>
<td>22,445</td>
<td>13%</td>
<td>6.6%</td>
<td>6.4%</td>
</tr>
<tr>
<td>0-9 years</td>
<td>37,157</td>
<td>19,013</td>
<td>18,144</td>
<td>10.5%</td>
<td>5.4%</td>
<td>5.1%</td>
</tr>
</tbody>
</table>
## Lane County Pyramid

<table>
<thead>
<tr>
<th>Ages</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>80+ years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70-79 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-69 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50-59 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-49 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-39 years</td>
<td></td>
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</tr>
<tr>
<td>20-29 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-19 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-9 years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Percent
Questions

Which age group is the largest in each county? Which is the smallest?

<table>
<thead>
<tr>
<th>Lane County</th>
<th>Multnomah County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Largest:</td>
<td>Largest:</td>
</tr>
<tr>
<td></td>
<td>Smallest:</td>
</tr>
<tr>
<td></td>
<td>Smallest:</td>
</tr>
</tbody>
</table>

Compare the two county population pyramids. How are they similar? How are they different?

They are similar because:

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

They are different because:

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

Do you see any noticeable differences between the genders in one single age range? Why do you think this is?

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________
Scale for Locations around the Community
by Tyler Sexton

Teacher Planning Information

Overview: This activity is designed to help students use scale by looking at a map of their community. Students will find the scale located on the map and figure out the distance between three locations in their community. The map provided is a community in Salem, OR, where the three locations are Riverfront City Park, Willamette University, and the Oregon State Capitol building.

Objectives: In completing this activity, students should be able to:
- Use scale correctly
- Figure out the distances between three locations in a community
- Use a map to identify places in a community

Oregon Common Core State Standards for Math:

CCSS.MATH.CONTENT.1.MD.A.2
Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.

Oregon Geography Content Standards:

1.10. Locate and identify important places in the community (school, library, fire department, etc.).

Grade: First

Time: 15 minutes

Materials:
- Paper (either lined or blank white paper)
- Pencils
- Community map with 1000 ft./300 m. scale bar (map of Salem, OR, provided)
- Worksheet (provided)
How to do this activity

1. Students will look at the map provided and will point to where the scale bar is located on the map. Hint the scale is in a corner of the map.

2. Next, the students will take a piece of paper and place it along the scale. They will then trace the scale onto their paper and label their line with 1000 feet. They will use this scale when completing the worksheet.

3. Students will complete the worksheet provided.
Worksheet

1. On the scale bar located on the map, there are two different numbers. They are, 300 m. and 1000 ft. 300 m. means that the distance is 300 meters and the 1000 ft. means 1000 feet. Are these distances the same? Discuss your thoughts with the group.

2. What is the distance, in feet, between the Oregon State Capitol building and Willamette University?

3. What is the distance, in feet, between the Oregon State Capitol building and Riverfront City Park?

4. What is the distance, in feet, between Riverfront City Park and Willamette University?

5. What is the total distance, in feet, if you walked from Willamette University to the Oregon State Capitol to Riverfront City Park?
Want Versus Needs
by Shawnti Peachey

Teacher Planning Information

Overview: This activity is designed to help students think about the difference between wants and needs, and then to consider how people living in a developing country might consider wants or needs differently.

Objectives: In completing this activity, students should be able to:

- Define what is a “want”
- Define what is a “need”
- Distinguish the difference between wants and needs
- Categorize information on a Venn diagram
- Compare and contrast pictures of wants/needs in North America to wants/needs in rural India

Oregon Common Core State Standards for Math:
K.MP.4. Model with Mathematics (Using a Venn diagram to represent the information).

Oregon Geography Content Standard:
K.7. Identify and compare and contrast pictures, maps and globes.

Oregon Economics/Financial Literacy Standard:
K.19. Distinguish between wants and needs.

Grades: Kindergarten

Time: 15 Minutes

Materials:
- Pictures printed out in color (included on pages 8-17). Only one set of pictures needed. Laminate if possible for longevity of use.
- Cut out all pictures.
- Label the back of the picture with the picture title from the top of each page. (Example Titles: Transportation, Jewelry, A Place to Live, etc).
• A large Venn diagram on Poster Board (example included on page 8 however it will need to be blown up onto a poster board size page. The students will be posting the pictures directly onto the Venn diagram. You can draw the Venn diagram with permanent marker by hand or increase the size of the one provided). Again, laminate if possible for longevity of use.
• Easel to hold the poster board Venn diagram (if you don’t have an easel, the Venn Diagram poster can just be laid on the table or posted on a nearby wall).
• Sticky tack (Must be sticky because each group will be posting and removing the pictures from the Venn diagram. Tape will get very messy).
How to do this activity

1. Work through the Background Information Page, answering and discussing the included questions.

2. Follow the directions on the Picture Sort Activity page. It will lead you through the hands-on activity.

3. Using the sticky tack provided at your table, take turns pasting your pictures onto the appropriate section of the big Venn diagram poster board.

4. Answer and discuss the extension questions.

5. If you still have time, work through more of the pictures.

6. Before leaving this station, please take your pictures off of the Venn diagram for the next group to categorize on their own.
Background Information Sheet

Individually, think about the following questions:

a. In your opinion, what is a want?
   b. In your opinion, what is a need?

Definitions:
*Need*: something you *can’t* live without.
*Want*: something you would like but that you *could* live without.

As a group discuss the differences between wants and needs. Use the definitions above to aid your conversations.

*NOTE*: When discussing wants and needs with other people, it's important to keep in mind that everyone has different opinions on what they want or need. Be respectful of everyone's thoughts, there are no right or wrong answers.

*Helpful Hint*: When considering the difference between wants and needs, think about if you could survive with or without this item?
Picture Sort Activity

1. You will find on the table an assortment of various pictures.

2. Note that the pictures are color-coded. Pictures with black borders are from North America. Pictures with red borders pictures are from rural India or Bangladesh (India).

3. Start with the black-bordered set of pictures.

4. Every person should pick up one black-bordered picture and decide if they think the item in the picture is a want or a need. Use the following sentence frame for support:
   I think this is a ___________ because ____________.
   (want/need)                  (your reason)

5. Share your picture and your thoughts in groups of two.

6. Then share your picture with the entire table group.

7. Move on to the red-bordered pictures.

8. Every person should pick up one black-bordered picture and find the matching red-bordered picture. The pictures are not exact matches, but the contents of the pictures are similar. Example: The following pictures both have playground structures:
9. If you can’t find the match, the picture title (e.g., “Playground”) is written on the back of the picture to help you with the matching.

10. Every person should compare and contrast their set of pictures. Consider the following:
   a. What is similar about the pictures?
   b. What is different about the pictures?
   c. Could I live with the picture from the red set of pictures?
   d. What set of pictures do I prefer to live with?

11. As a group, for each picture, decide if the item is a want, a need, both, or neither, and paste onto the Big Venn Diagram with the sticky tack provided.
Venn Diagram Example

Not able to classify

Wants

Both

Needs
A Place to Live

(Image from: American Campus Communities https://www.americancampus.com/student-apartments/or/corvallis/7th-street-station)

(Image from: flickriver http://www.flickriver.com/photos/firozeshakir/14140605230/)
Candy/Treats


Healthy Meals


Playgrounds


Running Water


Sports (for play or entertainment)

Image from: Annie Murphy Paul. (http://anniemurphypaul.com/2014/02/kids-are-playing-organized-sports-less-frequently/)

Friends


Pets

(Image from: http://funny-cat.blogspot.com/)

World Time Zones
by Shawnti Peachey

Teacher Planning Information

Overview: This activity is designed to have middle school students think about time differences between various cities and countries in the world, and to understand the abstract concept of having an International Date Line.

Objectives: In completing this activity the student should be able to:
- Understand the general concept of world time zones
- Understand what is Greenwich Mean Time (GMT)
- Understand what is the International Dateline
- Calculate the time difference between two different locations in the world using a time zone map.

Oregon Common Core for Math:
6.NS.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world context, explaining the meaning of 0 in each.
7.NS.1 Apply and extend previous understanding of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

Oregon Geographic Content Standards:
6.11 Distinguish among different types of maps and use them to analyze an issue in the Western Hemisphere
6.13 Classify and analyze the types of connections between places in the Western Hemisphere.
7.10 Interpret map and other geographic tools to find patterns in human and physical systems in the Eastern Hemisphere.

Grade: 6-7

Time: 15 minutes

Materials:
- Cardstock (2-3 pieces to put behind clock spinner)
- Tacks (2)
- Pencils (enough for everyone at activity)
Two copies of clock. Label one clock “AM” and another clock “PM”. Paste clocks onto cardstock with a tack. Make sure the spinner can spin appropriately.

Copies of the following:
- World Time Zones and Continents Map (2-3)
- World Time Zones and Countries Map (2-3)
- World Time Zones Map (2-3)
- World Cities Map (2-3)
- World Countries Map (2-3)

* Note: All maps are cited below. If necessary, follow the link to find a clearer image of each map to print.
- Background Information Page (2-3)
- Warm Up/Challenge Questions & Answers pgs 12 & 13 (2-3)
- Activity #1 (enough for everyone)
- Activity #2 (enough for everyone)
- Activity #3 (enough for everyone)

Sources:

Clock face with hands - https://www.pinterest.com/pin/535365474425485691/


World Cities Map - Compare Infobase Ltd http://www.mapsofworld.com/world-city-maps/

World Countries Map - Geology.com http://geology.com/world/world-map.shtml
How To Do This Activity

Read the **Background Information.**

Familiarize yourself with the **five time zone maps.**

1. World Time Zones and Continents Map
2. World Time Zones and Countries Map
3. World Time Zones Map
4. World Cities Map
5. World Countries

As a group, work together to answer the **Warm Up Questions.**

Work through **Activity #1 and #2.** Use the time zone maps to help you complete the worksheets.

Work through **Activity #3.** Use clock spinners and maps to help you complete the worksheet.

If you have time, work as a group to answer the **three Challenge Questions.**

*Notes: Activity #1, #2, and #3 do not necessarily have to be completed in order, however they are in order of difficulty level.

Also, you might need to use more than one map at a time. Not all of the maps have countries, cities, and time zones. So you might need to cross-reference the appropriate maps.
Background Information

Since 1884 the world has been divided into 24 different Time Zones, one for each hour of the day, 0-24. The Prime Meridian, which passes through Greenwich, England, starts the day at 0. The time is called Greenwich Mean Time (GMT).

Greenwich labeled with a green dot.
Warm Up Questions

1. What time is it in your time zone?
2. How many hours are you from GMT?
3. Name a country that is +3 hours from GMT.

4. What is the time difference between Oregon and Madagascar?
5. If it is 8:00 am in Oregon, what time is it in Madagascar?
6. If it is 8:00 am in Madagascar, what time is it in Oregon?

7. If you wanted to travel back in time to yesterday, which direction would you have to fly over the International Date Line, East or West?
8. If you wanted to travel forward in time to tomorrow, which direction would you have to fly over the International Date Line? East or West?

Challenge Questions:

1. If you live in Oregon and you want to call a friend who lives in Sydney, Australia at 2:30 pm in Australia, what time in Oregon would you have to make the call?
2. If you got on a plane in Portland, Oregon at 10:00 pm and got off the plane 11 hours later in Tokyo Japan, what time would it be in Tokyo when you arrive?
3. If you left Oregon at 7:00 am on June 10th, and drove for 27 hours to get to Kansas, what time would you arrive in Kansas? What date?
Warm Up Question Answer Key

1. Situational
2. Oregon is -8 hours from GMT
4. 8 hours
5. 6:00 pm the same day
6. 10:00 pm the day before
7. West
8. East

Challenge Questions Answer Key

1. 8:30 AM Oregon time
2. 12:00 AM (Midnight) in Tokyo
3. 1:00 PM June 11th
## Activity #1
Countries That Share a Time Zone

*Fill in the 3rd column*

<table>
<thead>
<tr>
<th>Location</th>
<th>GMT Number</th>
<th>Another country in this time zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midway Island, Samoa</td>
<td>GMT -11</td>
<td></td>
</tr>
<tr>
<td>Hawaii</td>
<td>GMT -10</td>
<td></td>
</tr>
<tr>
<td>Alaska</td>
<td>GMT -9</td>
<td></td>
</tr>
<tr>
<td>Mexico City</td>
<td>GMT -6</td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>GMT -3</td>
<td></td>
</tr>
<tr>
<td>GREENWICH, England</td>
<td>GMT 0</td>
<td></td>
</tr>
<tr>
<td>Paris</td>
<td>GMT +1</td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>GMT +2</td>
<td></td>
</tr>
<tr>
<td>Bangkok, Thailand</td>
<td>GMT +7</td>
<td></td>
</tr>
<tr>
<td>Beijing, China</td>
<td>GMT +8</td>
<td></td>
</tr>
<tr>
<td>Tokyo, Japan</td>
<td>GMT +9</td>
<td></td>
</tr>
<tr>
<td>Auckland, New Zealand</td>
<td>GMT +12</td>
<td></td>
</tr>
</tbody>
</table>
Activity #2
Calculating the Distance Between 2 Places

*Calculate the difference (2\textsuperscript{nd} column)*

<table>
<thead>
<tr>
<th>City</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stockholm, Sweden and each of the following</td>
<td>GMT of Stockholm:</td>
</tr>
<tr>
<td></td>
<td>Difference ( Hours + or - )</td>
</tr>
<tr>
<td>Paris, France</td>
<td></td>
</tr>
<tr>
<td>Beijing, China</td>
<td></td>
</tr>
<tr>
<td>Tokyo, Japan</td>
<td></td>
</tr>
<tr>
<td>Los Angeles, California</td>
<td></td>
</tr>
<tr>
<td>Iceland</td>
<td></td>
</tr>
</tbody>
</table>
Activity #3
Figuring out GMT and Time Differences

<table>
<thead>
<tr>
<th>Location #1</th>
<th>Location #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spin AM clock.</td>
<td>Spin PM clock.</td>
</tr>
<tr>
<td>Write time here <em><strong>:</strong></em>__.</td>
<td>Write time here <em><strong>:</strong></em>__.</td>
</tr>
<tr>
<td>GMT ___________</td>
<td>GMT ___________</td>
</tr>
</tbody>
</table>

Time Difference between Location #1 and Location #2 ________________.

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Time Difference between Location #1 and Location #2 ________________.

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</tr>
<tr>
<td>GMT ___________</td>
<td>GMT ___________</td>
</tr>
</tbody>
</table>

Time Difference between Location #1 and Location #2 ________________.
Don’t Worry, Be Mappy
Part I: Getting to the Point

You will need: 1 plastic bottle cap, 1 piece of gum, 1 paperclip, 1 cup (that you won’t mind marking up), 1 ruler, 1 piece of yarn, 1 permanent marker, 1 pair of scissors, plastic cling wrap, and a magnet!

★ First, unfold and straighten the outer loop of the paperclip to create a compass point.

★ Magnetize the paperclip by swiping the magnet against it 50 times from the paperclip’s round end to its point. Only move the magnet in one direction, not back-and-forth - and chew a piece of gum while you swipe!

★ Lightly pack paper into your bottle cap. Stick the gum on the paper and press the paperclip into the gum so that it rests evenly on the edges of the bottle cap.

★ Fill a cup 3/4 with water and place your compass in the water (we re-used an old coffee cup).

★ The point of the compass should slowly spin and float to a point on the cup’s circumference. You can test its accuracy with a traditional compass or compass app.*

To put cardinal markers on your cup:

★ Wrap a string around the rim of the cup and cut it to match the cup’s circumference.

★ Hold the string against a ruler, then add 3 lines with a marker to divide the string into 4 equal segments.

★ Finally, wrap the string back on the cup and mark the cup’s rim where there are lines on the string, and where the ends of the string meet. Label the 4 lines clockwise starting with N for North, E for East, S for South, and W for West. A fun trick to remember the order: Never Eat Soggy Waffles!

★ Put plastic wrap over your compass, then walk around your house or outdoors with your compass to orient yourself!

* If your compass is not pointing North, you may need to magnetize the paperclip further - rub it with the magnet 50 more times.

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Don’t Worry, Be Mappy
Part 2: Surveying Your Kingdom

You will need: graph paper, 1 tape measure, 1 ruler, 1 pencil, and your compass from the first activity - or any other compass!

★ First, decide what part of your home you want to map - you could do a bedroom, multiple rooms, or even the whole house!

★ Use a measuring tape to record the length of the main walls of your house from the outside.

★ Now, look at your graph paper. How many squares long is it, and how many wide? Now look at the amount of area you want to plot: how many feet long, and how many wide?

★ Use these numbers to figure out how the squares of graph paper will need to match up with the number of feet to fit your map on the page. **Divide** the length of the area in feet by the number of squares of length. If your house is 60 feet long and your paper is 20 squares long, then each square will represent, or match up to, 3 feet. That’s called the **scale** of your map.

★ Then test your scale to see if it will fit the width of your house. Multiply the number of squares of width by your scale to see how many feet of width your paper can cover. If the width of your house won’t fit, then you’ll need to use the width to determine your scale: divide the width in feet by the squares of width.

(Activity continued on next page!)

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Don’t Worry, Be Mappy
Part 2: Surveying Your Kingdom

★ Now the fun part: start drawing your home on the paper! Starting with the walls of each room, measure each wall, then draw it in that basic compass direction on your paper. Pick the closest straight line on the paper - drawing on angles will be much, much harder.

★ Once you have the walls mapped, start measuring and mapping doors, windows, furniture and other big objects!

★ Which room in your house covers the most square feet? Which room has the largest object in it?

★ How many grid boxes on your map are empty? How many are covered by furniture, appliances, or that pile of socks you’ve been meaning to clean up? How many square feet do those boxes correspond to?

★ Now, orient your map to match the real world! Spin the paper so that an outer wall points the same direction as it does in real life - use a compass to be sure!

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Don’t Worry, Be Mappy
Part 3: Racing Off the Grid

You will need: Your house map from the last activity, 1 pencil, at least 2 crayons, scissors, and a pair of dice!

★ First, turn your house map into a game board - create a starting point in one corner of the map and a finish line at a far corner.
★ We also added doors to make it easier to move throughout the house, as well as stuffed animal obstacles, “warp zones” and wormholes! (See our game board on the next page for an example).
★ Cut out and color 1 grid box as a game piece for each player.
★ The first player rolls 2 dice. The player can then choose their move: add the 2 dice together and move that number of boxes in horizontal and vertical directions.
★ Players take turns rolling and racing towards the finish line. Use a pencil point to move the game pieces as you count boxes out loud!
★ Add your own rules - for example, maybe players can climb over couches, but it will cut their roll in 1/2 to do so!
★ After the first game, study the board - what is the shortest possible path through the house? If a player rolled double-sixes every single roll, how many turns would it take to reach the finish line?

Moving with a roll of 5+2

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Don’t Worry, Be Mappy
Part 4: The House Always Wins

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