

<i>Representing World Wealth: Where in the world is all of the money??</i>		
Description	Instructor Notes	Slides/Handouts/Files
<p>This activity engages students in comparing the population and wealth of different regions of the world using percentages, bar graphs, double bar graphs, and circle graphs. The activity is designed to raise students' awareness of world poverty.</p>	<p>Note: If students have just completed <i>Representing World Population</i>, the names of the regions will be listed in L7 (named <b>REGION</b>). Students will not need the data in POP1 or POP2.</p> <p><b>Estimated vs. Actual Wealth of the regions:</b> Ask students to place the 25 chips on their world maps to represent each region's portion of the world's population (give students this data).</p> <p>Have student work in pairs to distribute the 25 pennies across the different regions of the world according to their own ideas about region's portion of the world's wealth. As students work, ask questions about the decisions they make. Have students list their wealth estimates (in number of pennies) in the table on the Student Activity Sheet.</p> <p>Have students determine the estimated percent of the world population based on their placement of the pennies and list their percent estimates in the table.</p> <p>Give students the actual world wealth data in <u>percent</u> of world wealth for each region, and have them enter this data into their chart. Ask students to determine the amount of wealth for each region based on the total world wealth of \$28,081 billion (or <math>2.8081 \times 10^{13}</math>), and enter this data into their chart.</p> <p>Have students create a double bar graph of the estimated vs. actual data (using percent per region). Have students create a single bar graph for the actual wealth data (using percent per region). [See the Calculator Support sheet.]</p>	<p>Student Activity Sheet</p> <p>Calculator Support</p> <p>Materials: 25 cookies 7 brown paper bags</p> <p>Each group needs:</p> <ul style="list-style-type: none"> <li>• World Map (p. 5)</li> <li>• 25 pennies</li> <li>• 25 chips</li> </ul>

## Instructor Notes (con't)

Ask students:

- Were the data easier to compare numerically or in a graph?
- Which visual comparison do you prefer, the map, or the double bar graph? Why?
- What connections do you see between the different representations?
- Were there any difference between your estimates and the actual data that that surprised you?
- Are there differences between regions that surprise you?

OPTIONAL: Have students create a circle graph based on the % of wealth for each region.

Ask students:

- How can you tell which region is which?
- What happens when you use TRACE on the bar graph?
- What happens when you use TRACE on the circle graph?
- What connections do you see between the circle graph and the bar graph?
- Make 2 statements or comparisons about the wealth of the different regions based on the bar graph.
- Make 2 statements or comparisons about the wealth of the different regions based on the circle graphs.
- What are some conclusions about world wealth? What surprised you?

### **Comparing the population vs. wealth of different regions:**

Have students create a double bar graph that compares the population vs. wealth of each region.

Ask students:

- What does the double bar graph tell you when: a) the first bar is higher than the second bar? b) the first bar is lower than the second bar? c) the bars are about the same height?
- Which regions have the largest differences in population vs. wealth?
- Write a statement about the population vs. wealth within each region.
- What comparisons can you make between the different regions?

Compare the population vs. wealth data using a scatterplot. Have students plot the points as (Population, Wealth). Include the line  $y = x$  in the graph and ask students:

- What does it mean for a region to be above the line? What region is the farthest above the line? What does that tell you about that region?
- What does it mean for a region to be below the line? What region is the farthest below the line? What does that tell you about that region?
- What does it mean for a region to be close to the x-axis (or to the y-axis)?
- In what ways does the scatterplot help you make comparisons between the population and wealth of different regions of the world?

**Optional: Modeling the differences in world population vs. wealth:**

Have 25 cookies or other treats that can be divided into fractional pieces. The treats represent the total world wealth. Label brown paper bags with the names of each of the regions. Place treats into each bag to represent the region's portion of the world's wealth (see the table on page 4). Have the paper bags sitting in six different locations in the classroom.

Have 25 students represent the world's population. Create 25 slips of paper. Write the name of one region on each slip of paper, so that the 25 slips of paper reflect the distribution of the world's population (see the table on p. 4). Have each of the 25 students pull a slip of paper out of the bag and move to the region indicated on the slip of paper. Once all students have been assigned to a region, explain that they represent each region's portion of the world's population and the paper bags hold the regions portion of the world's wealth (represented by the treats). Ask them to divide up the region's wealth so that each person receives the same amount. Have students discuss the feelings that surface as they see how much (or how little) the people in other regions receive (i.e., anger or envy toward wealthy regions; charity toward less fortunate regions; wanting to relocate/immigrate to another region).

Note: The number of treats and slips of paper can be adjusted to fit the number of students in your class.

## Participant Discussion

This activity is adapted from: Hersh, S. & Peterson, B. (2005). Poverty and World Wealth. In E. Gutstein & B. Peterson, *Rethinking Mathematics: Teaching Social Justice by the Numbers*, p. 64-67. Milwaukee, WI: Rethinking Schools Publications. Available at: <http://www.rethinkingschools.org/publication/math/>

This activity is intended to be used following *Representing World Population: Where in the world are all of the people??*, though it can be used independently. You may want to use some of the questions posed in *Representing World Population*.

### Mathematical Ideas in the Activity:

- Finding the percent of a quantity
- Changing fractions to decimals and percents
- Estimating
- Large numbers and Scientific Notation
- Bar Graphs
- Double bar graphs
- Circle Graphs
- Scatterplots

### Teacher Notes:

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World Wealth Data:

Region	# of pennies (out of 25)	# of cookies (out of 25)	# of people (out of 25)	Wealth in Billions of \$	Estimated % of World Wealth	Estimated % of World Population
Africa	1	0.5	4	495.4	1.8	14.0
Asia	6	6	15	7,172.6	25.5	60.4
Oceania	1	0.5	0	442.4	1.6	0.5
Europe	8	9	3	9,606.3	34.2	11.3
US and Canada	8	8	1	8,933.6	31.8	5.1
Latin America	1	1	2	1,430.7	5.1	8.7
<b>Total</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>28,081.0 Billion</b>	<b>100.0</b>	<b>100.0</b>

Source: Hersh, S. & Peterson, B. (2005). Poverty and World Wealth. In E. Gutstein & B. Peterson, *Rethinking Mathematics: Teaching Social Justice by the Numbers*, p. 67. Authors cite the source of their world wealth data as: GNP World Bank, Universal Almanac 1994. Authors cite the source of their population data as: UN Population Division, July 2005, [www.un.org/esa/population](http://www.un.org/esa/population).

You may want to adapt the values in the chart to reflect a more current estimate of world wealth or percentage of the world's wealth per region.



Source: <http://www.mapsofworld.com/world-political-map.htm>

The website offers a printable version of the map.

This is the same map shown on the Student Activity sheet.