

# Using Graphs

## Enduring Understandings:

- Foreign trade is affected by the price of foreign currency.
- Different sectors of the economy contribute to a country differently.
- Countries can have many different trading partners.
- Statistics help us to learn about the economy of other countries as well as our own.
- Different types of graphs are helpful for different types of data.

## Essential Questions:

- How does foreign currency change in value?
- How do different parts of the economy contribute to the country as a whole?
- What countries does South Korea trade with?
- What can we learn about a country from statistics?
- How do graphs help us to manage and understand data?

## Notes to the Teacher:

In this lesson, students use statistical data about South Korea to practice gleaning information from tables and presenting the information using different types of graphs. In the first activity, students learn about how different currencies can be valued next to each other. Using a line graph to organize and view data, they track the rise and fall of the *won* vs. the U.S. dollar. (It is important to remind students that the changes over time can be as much a result of the change in the value of the dollar in world markets as it is a result of a change in the value of the *won*.)

In the second activity, students use a bar graph to help them understand two aspects of the South Korean economy: what people do for a living and how much value they contribute to the country's economy as a whole. By plotting both sets of data on one graph, students can visualize the relative strengths of each sector of the economy.

The third activity builds on information from **LESSON 8** but it can also be done independently. Students are given statistical data about South Korea's major trading partners and they use circle graphs to visualize the relative importance of imports and exports to each country. You will make one graph with them and they will make the second graph on their own.

While **HANDOUT 1** provides opportunities for guided practice, the assignment in Activity 4 asks students to demonstrate their abilities to gather and use data by selecting a set of data, making a table, creating an

appropriate graph, and presenting it to the class. You may wish to divide the class into groups or have students work individually on this activity.

### ASSESSMENT:

Students will construct a line graph, a bar graph, and a circle graph using **HANDOUT 1**.

Students will record data in a table, create an appropriate graph, and explain the process by which they constructed the graph.

### DURATION OF LESSON:

Two or three periods for working with South Korean data  
One week for recording student data and making graphs.  
One period for presenting graphs.

#### STANDARDS

Indicators addressed by this lesson:

**STANDARD 6.** Understands and applies basic and advanced concepts of statistics and data analysis

#### LEVEL III (GRADES 6-8)

4. Reads and interprets data in charts, tables, and plots (e.g., stem-and-leaf, box-and-whiskers, scatter)
5. Uses data and statistical measures for a variety of purposes (e.g., formulating hypotheses, making predictions, testing conjectures)
6. Organizes and displays data using tables, graphs (e.g., line, circle, bar), frequency distributions, and plots (e.g., stem-and-leaf, box-and-whiskers, scatter)

## Materials:

Examples of U.S. and foreign currency. (If you don't have currency available, you can download color images of it from the Internet. For example, the front and back of the 10,000 *won* note can be printed from <http://www.guardianfx.com/information/asia/korea.html>. You can locate many other currencies on this website using their index page at <http://www.guardianfx.com/siteindex.html>.)

Student copies of **HANDOUT 1: USING GRAPHS**

Graph paper

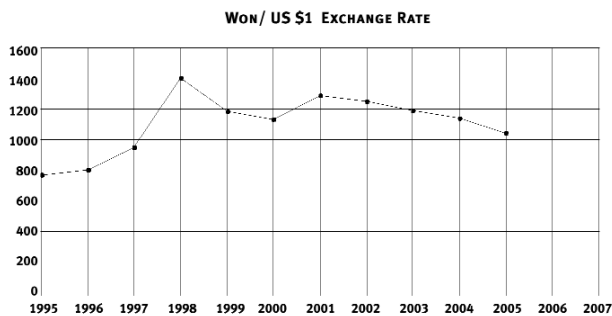
Compass and straightedge

## Procedure:

### ACTIVITY 1: Line Graph

1. Explain to students that statistics can be a very good way to learn about what is happening to a country's economy.
2. Explain to students that international trade is very complicated because each country's money or currency has a different value. When a business wants to buy a product made in another country, it must pay in the *currency* of that country, and so it must buy foreign currency at the going rate. The price of the foreign currency can go up or down, like all prices.
3. Give students a chance to examine both U.S. and foreign currency, noting various units and amounts. Ask if students have traveled overseas and have had the opportunity to use a foreign currency. What did they learn from this experience?

- Distribute **HANDOUT 1: SOUTH KOREA BY THE NUMBERS**. Ask students to read “Problem 1: What does a dollar buy?” Give them the opportunity to find out the current rate of exchange by using a currency conversion program on the computer or provide them with the figure if a computer is not readily available. Ask them to update the table.
- Review the different types of charts that students are familiar with (e.g., bar graph, line graph, circle chart, scatter diagram, etc.). Ask which one would be most useful in showing the information in Table 1. (Line graph). Distribute graph paper and work with the students to create a line graph based in this information. The graph should look like this:



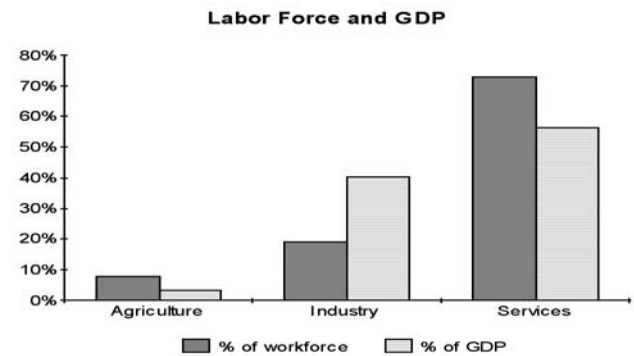
- Help students to understand that the more *won* one can get for a dollar, the cheaper Korean products are for a North American to buy. Have them finish the remaining questions for Problem 1. (Answer to Question #4: 1998; Question #5: 1995.)

**ACTIVITY 2: Bar graph**

- Ask students to read the information at the top of Page 2 of the handout, including Table 2. Be sure they understand what is meant by the sectors. (People who

work in agriculture are primarily farmers; people in industry are primarily factory workers; people who work in services are teachers, shop clerks, medical personnel, restaurant workers, and anyone else who provides a service rather than producing goods.)

- Explain to them that GDP, or Gross Domestic Product, is a term that economists use to describe the value of all the goods and services produced by a country. Have them look at Table 3, and ask which sector produces the greatest value. (The service sector).
- Have students construct a bar chart on graph paper that combines the information from both tables. The chart should look like this:



- Ask students: Which sector produces the as to value relative to the number of people involved in it? (Industry). Which one produces the least value relative to its size? (Agriculture). Have students fill in the answers to Questions 2 and 3.
- Ask students to formulate a hypothesis as to why the people in the farming community are so poor relative to people in the city. (Farmers produce goods that are of lower economic value.) Do they think that this

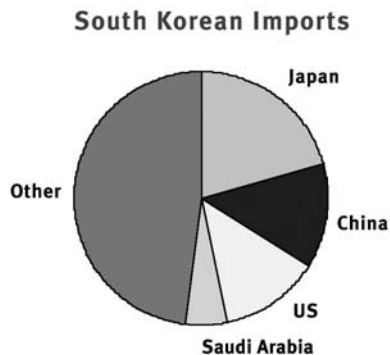
hypothesis explains all the difference in their lifestyles? What other factors might be at work? (Answers will vary.)

**ACTIVITY 3: Circle Graph**

1. If students have already done **LESSON 8**, remind them about South Korea’s trading partners. Tell students that their next problem is to learn about the countries South Korea trades with.
2. Have students study at the top of **HANDOUT 1**, Page 3. Be sure that they understand the difference between imports and exports.
3. Demonstrate to students how to make a circle graph for Table 4. The graph will look like this:



4. Have students make their own circle graphs for Table 5. The graphs should look like this:



5. Ask students to answer the rest of the questions on the worksheet.

(Answers: 2. China. 3. Japan. 4. 4.1%. 5. Answers will vary.)

**ACTIVITY 4: Assignment**

1. Ask students to gather a set of data over the next week from their own lives. For example, they might record on a daily basis the amount of time they spend doing a favorite activity; the number of calories they consume; the types and duration of the television programs they watch; how often they make or receive phone calls, etc.
2. Have students compile the data in a table format.
3. Ask students to select the best type of graph to use to present their data, and then to construct the graph.
4. Have students present their findings to the class and explain how they made their graphs.

**EXTENSION ACTIVITIES:**

1. If you know how to enter data and make charts on a program such as Microsoft Works or Excel, you can demonstrate this to the class as an extension activity. Be sure that you practice beforehand to get the effects that you want!
2. Teach students additional ways to manage data, such as stem-and-leaf plots and scattergrams.
3. Have students go through the items in their wardrobe, checking the labels on their clothing and recording where the items are made. Use the data to compile a class table of where typical North American clothing comes from and make an appropriate chart to display your findings.

HANDOUT 1 ▶ P. 1 South Korea by the Numbers

**Problem 1:** What does a dollar buy?

Look at the following table, which shows how many *won*, the currency of South Korea, are equal to a U.S. dollar.

1. What is \$1.00 worth in South Korean *won* today? Fill in the date and the amount in the bottom row of the chart. [Hint: you can find this information easily at a currency conversion site like the Universal Currency Converter at <http://www.xe.com/ucc/>.]
2. What kind of graph would be the best to show the changes in the value of the *won*?

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Table 1

Year	Exchange Rate ( <i>won</i> /\$)
1995	771.27
1996	804.45
1997	951.29
1998	1,401.44
1999	1,188.82
2000	1,130.32
2001	1,290.99
2002	1,251.09
2003	1,191.61
2004	1,143.7
2005	1045.8
Current	

3. On your graph paper, make a graph that visually represents the information in the table above. Be sure to label the axes and the chart correctly.
4. In what year could you have bought a television from South Korea for the fewest dollars? \_\_\_\_\_
5. In what year would buying the same television have been most expensive for you? \_\_\_\_\_
6. If Sang-Woo’s action figure cost \$12.50 in the U.S. today, how much would it cost in South Korean *won*? \_\_\_\_\_

HANDOUT 1 ► P. 2

**Problem 2:** How do South Korean workers earn their money?

Workers in South Korea are employed in three main areas or *sectors* of the economy. This chart shows you where they work.

Table 2

Sector	Percent of labor force, 2004
Agriculture	8%
Industry	19%
Services	73%

However, the value of what they produce is not exactly the same.

Table 3

Sector	Gross Domestic Product
Agriculture	3.2%
Industry	40.4%
Services	56.3%

- On your graph paper, create a bar graph that shows the information contained in these two tables. Use colored pencils or markers as a key to the meaning of each bar. Be sure to label the axes correctly.
- Which sector of the economy creates the most value for its labor relative to its size?  
\_\_\_\_\_
- Which sector of the economy creates the least value for its labor relative to its size?  
\_\_\_\_\_
- How do these differences help to explain the difference in lifestyle between Sang-Woo’s life in the city and his grandmother’s life in the country?

[Source: [http://en.wikipedia.org/wiki/Economy\\_of\\_South\\_Korea#Economic\\_Profile](http://en.wikipedia.org/wiki/Economy_of_South_Korea#Economic_Profile)]

**HANDOUT 1 ▶ P. 3**

**Problem 3:** What countries does South Korea trade with?

Study Tables 4 and 5, which show South Korea’s main trading partners.

**Table 4**

Country	% of South Korea’s Exports, 2004
<b>China</b>	19.7%
<b>United States</b>	17%
<b>Japan</b>	8.6%
<b>Hong Kong</b>	7.2%
<b>Other</b>	47.5%

**Table 5**

Country	% of South Korea’s imports, 2004
<b>Japan</b>	20.6%
<b>China</b>	13.2%
<b>United States</b>	12.9%
<b>Saudi Arabia</b>	5.3%
<b>Other</b>	48%

1. Make a circle graph for each of the tables above. Be sure to label the graphs and the segments correctly.
  
2. Which country buys the largest share of South Korea’s exports? \_\_\_\_\_
3. From which country does South Korea buy the largest share of its imports? \_\_\_\_\_
4. What is the difference between what South Korea sells to the United States and what it buys from the United States? \_\_\_\_\_  
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 \_\_\_\_\_
5. What do you think the U.S. could do to change this trade imbalance?  
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 \_\_\_\_\_  
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