

## *What Causes Stock Prices to Change?*

### *Lesson Summary*

*What Causes Stock Prices to Change?* explores the influences that affect stock prices.

### *Lesson Objectives*

- Analyze and interpret market indices, which influence change in the price of stock.
- Discuss the various ways stock prices are influenced.
- Evaluate the ways investors can be affected by the change in market prices when choosing to buy, sell, or hold.
- Interpret charts and graphs to better understand the growth and change in stock prices.

### *NCTM Standards*

1A - Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

5A - Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

5B - Select and use appropriate statistical methods to analyze data.

5C - Develop and evaluate inferences and predictions that are based on data.

5D - Understand and apply basic concepts of probability.

7B - Make and investigate mathematical conjectures.

7C - Develop and evaluate mathematical arguments and proofs.

8A - Organize and consolidate mathematical thinking through communication.

8B - Communicate mathematical thinking coherently and clearly to peers, teachers, and others.

8C - Analyze and evaluate the mathematical thinking and strategies of others.

8D - Use the language of mathematics to express mathematical ideas precisely.

9C - Recognize and apply mathematics in contexts outside of mathematics.

10A - Create and use representations to organize, record, and communicate mathematical ideas.

### *Mathematical Strands*

	<b>Thinking Algebraically</b>	Students calculate Price/Earnings Ratios as well as solve for stock prices and earnings-per-share values.	
	<b>Interpreting Statistics</b>	Students examine the trajectories of two stocks after Hurricane Katrina, write about the information presented, and hypothesize why certain sectors did poorly after this event while others gained.	
	<b>Communicating Quantitative Information</b>	Students will write a brief description of events that might make a company perform the way shown in the graph.	
	<b>Tackling Complex Problems</b>	Students use announcements from the Federal Reserve to predict market activity.	

**Calculating Price/Earnings (P/E) Ratios**

A P/E ratio is the quotient of a share's current price to the company's earnings per outstanding share.

$$\text{P/E ratio} = \frac{\text{Price _ per _ Share}}{\text{Earnings _ per _ Share}}$$

*Use this information to answer each problem.*

1. If the company's earnings per share are \$1.75, and the current share price is \$14.50, what is the P/E ratio?
2. A company's earnings per share are \$0.80, and the current share price is \$40.95. What is the P/E ratio for this company?
3. A stock is trading at \$53.28 while the company's earnings per share are \$1.39. What is the P/E ratio for this stock?
4. If a company's earnings per share are \$2.01 and its stock is currently valued at \$21.70, what is the stock's P/E ratio?
5. If a company's stock is trading at \$38.42, and its P/E ratio is 25.69, what are its earnings per share?
6. A company has a P/E ratio of 17.51 and a stock value of \$42.80. What are its earnings per share?
7. A company's earnings per share are \$2.04 and its P/E ratio is 29.55. What is the value of the company's stock?
8. If the P/E ratio of a stock is 1.49 and its earnings per share are \$1.17, how much would it cost to buy 550 shares of its stock?



## Shocks to the Stock Market

*Hurricane Katrina, one of the deadliest hurricanes in American history, struck the Gulf Coast in late August of 2005. This tragedy also affected the stock market because investors knew that companies would be influenced differently by this event.*

*The graphs below show two different industries' performances over the same time period. One of the trend lines shows the performance of companies that owned lumber businesses, while the other trend line tracks the performance of residential insurance companies.*

1. Which trend line, the dotted or solid, do you think belongs to the lumber businesses and which belongs to the residential insurance companies? Explain your answer.



2. The two sectors either rise or drop suddenly right around the time of Hurricane Katrina, and then begin to recover from the initial shock. Where in the graph do you see this recovery?
3. What is another example of an industry that would have experienced great losses after Hurricane Katrina? Sketch a trend line for this industry on the graph above.
4. What is an example of an industry that would have experienced gains after Hurricane Katrina? Sketch a trend line for this industry on the graph above.

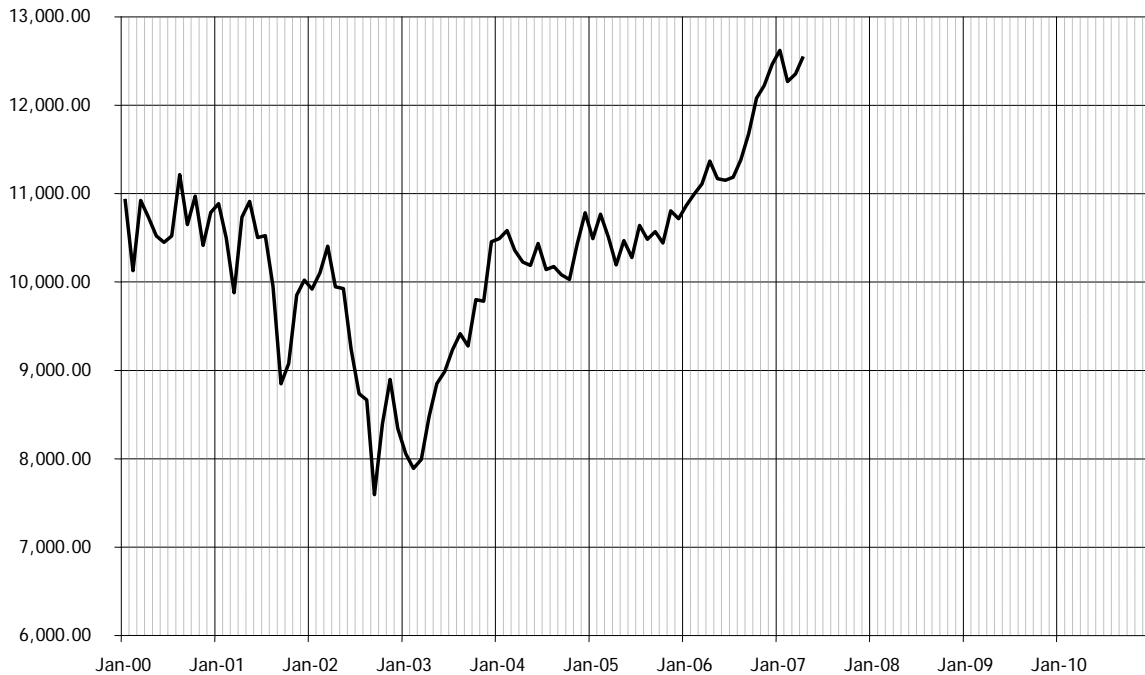


## COMMUNICATING QUANTITATIVE INFORMATION

### Looking at the Effect of World Events

Below is a graph of the Dow Jones Industrial Average from January 2000 to April 2007.

**Dow Jones Industrial Average**



*Use the graph to identify where each historical event occurred and what happened to the market.*

1. Terrorists attacked the United States in September 2001.
2. President Bush was re-elected in November 2004.
3. The Euro was introduced in January 2002.
4. The merger between AOL and Time Warner was approved in February 2001.

*Find another dramatic rise or drop in the market, and research what was happening in financial and world news at that time.*



## TACKLING COMPLEX PROBLEMS

### Looking to the Federal Reserve

*Investors listen to the announcements made by the Federal Reserve (Fed) to determine whether the stock market will rise or fall.*

*If the Fed thinks that the economy is doing well, the stock market tends to rally. If the Fed thinks that inflation (how much the prices of goods rise over time) is under control, the stock market also tends to rally.*

*For the following statements, summarize what the Federal Reserve has said, and then predict what the market would do after each announcement.*

1. "Recent indicators have suggested somewhat firmer economic growth, and some tentative signs of stabilization have appeared in the housing market. Overall, the economy seems likely to expand at a moderate pace over the coming quarters." (January 31, 2007)
2. "Readings on core inflation have improved modestly in recent months, and inflation pressures seem likely to moderate over time. However, the high level of resource utilization has the potential to sustain inflation pressures." (January 31, 2007)
3. The Federal Reserve Open Market Committee judges that some further policy firming might be needed to address inflation risks.

*Answer these questions based on information about actions by the Federal Reserve.*

4. After an announcement from the Fed, the stock market dropped .064%. If a major market index was previously at a value of 11,230, what would you predict to be the value of the index after the announcement?
5. If an announcement from the Fed caused a major index to jump from 12,843 to 13,006, how big was this jump as a percentage?

