

SPECIFIC OBJECTIVES

Students will understand that

- a relative change is different from an absolute change.
- a relative measure is always a comparison of two numbers.

Students will be able to

- calculate a relative change.
- explain the difference between relative change and absolute change.

PROBLEM SITUATION 1: SALARY INCREASES

The table below shows the 2013 and 2014 salaries of several employees at a company named Flexcorp.

Employee	2013 salary	2014 salary
Maria Chavez	\$200,000	\$230,000
Peter Chin	\$120,000	\$144,000
Lawrence Cromwell	\$60,000	\$72,000

(1) Calculate the raise that each employee received.

Maria Chavez

Peter Chin

Lawrence Cromwell

The raises calculated above each represent the absolute change in the employees' salaries. The absolute change is the total amount of change between two numbers. In the event of an increase the absolute change is positive, and in the event of a decrease the absolute change is negative.

- (2) At first Maria Chavez was pleased with her raise. But when she learned the amounts of her colleagues' raises, she went to see the CEO of the company and complained that the amount of her raise was too low, compared to the others'. What mathematical justification might Maria have for arguing that her raise was too low?
- (3) Based on your discussion of Maria's situation, what do you think would be a fair raise for Maria to receive?

PROBLEM SITUATION 2: STOCK INVESTMENTS

The table below shows the share prices for three stocks over the course of a year.

Company	Price per share (dollars) December 31, 2012	Price per share (dollars) December 31, 2013
Google	350	559
Microsoft	27	37
Best Buy	11	40
Facebook	25	55

- (4) Rank, from best to worst, the 2013 performance of the above stocks.

- (5) Suppose you had \$20,000 to invest in the beginning of 2013, and you could choose two of the above four stocks in which to invest. Invest \$10,000 in each, and calculate the total value of the investment at the end of the year. (Note: you cannot buy part of a share.)
- (6) How would you mathematically compare the performance of Best Buy stock to Google stock?

PROBLEM SITUATION 3: ECONOMIC GROWTH

The GDP (Gross Domestic Product) represents the total amount of goods and services produced by a nation in a given year. The table below gives the GDP for several countries over a period of years in billions of dollars, rounded to the nearest billion dollars.

Country	GDP in 2000	GDP in 2010
United States	12,682	14,945
India	692	1,365
Japan	4,732	5,495

- (4) Estimate which country above represents the largest absolute change in GDP, and which country witnessed the greatest relative change in GDP.

(5) Which of the above countries' economies grew the fastest? Which of these countries' economies grew the most?

(6) Make a prediction for India's GDP in 2020. Justify your answer in complete sentences using precise mathematical terminology.

MAKING CONNECTIONS

Record the important mathematical ideas from the discussion.

FURTHER APPLICATIONS: EXPANDING REVENUE

(1) Your company has a main downtown flagship store, and a smaller store in a suburban area. You are implementing a new advertising campaign on the subway, and expect revenues to go up. Do you expect to have the same absolute increase in revenues between the 2 stores, the same relative change in revenues, or both? Explain your answer.