

# Percent of Increase or Decrease

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<b>Strand:</b>	Computation and Estimation
<b>Topic:</b>	Finding percent of increase or decrease
<b>Primary SOL:</b>	8.4 The student will solve practical problems involving consumer applications.

## Materials

- Chart paper
- Markers
- Percent of Increase and Decrease Problems (attached)

## Vocabulary

*change, decrease, increase, percent, ratio (earlier grades)*

## Student/Teacher Actions: What should students be doing? What should teachers be doing?

1. Give students the following problem: “In 2012, it cost \$6.00 for a student movie ticket. Today, it costs \$10.00 for a student movie ticket. Find the percent of increase in the ticket price.” After students have tried to solve the problem individually, have them discuss with partners what they did, why, and their answers. Give each pair a sheet of chart paper and a marker, and have pairs show all the steps in their work and an explanation of what they did.
2. Display all charts, and have students walk through the classroom to see each pair’s work, the steps they used, and their reasoning. Instruct students to take notes on any important observations.
3. Hold a class discussion about the different approaches students used, their reasoning, their steps, and their answers. Lead the class to develop a process for finding percent of increase.
4. Ask students to solve the following problem, adapting the process they just devised: “Last year, there were 750 students enrolled in Park School, but this year there are only 685 students enrolled. What is the percent of decrease?” Discuss the process and responses to this problem. Lead the class to develop a process for finding percent of decrease.
5. Give each student pair a set of the Percent of Increase or Decrease Problems cards. Have pairs first sort the cards into two categories—percent of increase or percent of decrease. Then, have them work to solve the problems, using the processes they developed as a class.

## Assessment

- **Questions**
  - If the cost of a dress is \$75.00 and Janelle gets it on sale for \$60.00, what is the percent of discount? How do you know?

## Mathematics Instructional Plan – Grade 8

- How do you determine whether you are looking for a percent decrease or percent increase?
- **Journal/writing prompts**
  - Describe two strategies you can use to find the percent of decrease for the following problem: “In 2010, it cost \$3.29 for a gallon of milk, while in 2017, the cost was \$2.83. What is the percent of decrease in the price from 2010 to 2017?”
  - Percent increase and percent decrease are percents of change. What are the similarities and differences in the processes of calculating these percents of change?
- **Other Assessments**
  - Brainstorm with the class what types of situations would involve an increase and what types of situations would involve a decrease. Include markup and discount.

### Extensions and Connections (for all students)

- Have students research online the changes in prices of certain products from one year to another. Then, have them calculate the percent of increase or decrease for each product.
- Relate percent of change to civics lessons regarding economics, including supply and demand, markup, and discount.

### Strategies for Differentiation

- Before solving each problem, have students first identify whether the problem is addressing an increase or a decrease, then use arrows to denote increase and decrease.
- Have students create their own sale flyer for one item, showing its original price, its sale price, and the percent of decrease. Include calculating sales tax in the activity to link to other content of SOL 8.4.
- Have students graph original and sale prices on a line graph to represent the change in prices visually.
- Rewrite questions to reduce extraneous information.
- Review essential vocabulary with certain students before introducing the lesson.
- Provide students with completed examples for reference, either on the board or paper copies, while completing activities during class.

**Note: The following pages are intended for classroom use for students as a visual aid to learning.**

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## Percent of Increase or Decrease Problems

Copy on card stock and cut out.

<p>Today, the price of a new cellphone is \$380. In 2010, the price of a similar cellphone was \$240. What is the percent of change in the price of a cellphone from 2010 to today?</p>	<p>In 2010, the average attendance at a Washington Capitals hockey game was 18,397. This year, the average attendance was 18,506. By what percent did the attendance increase from 2010 to now?</p>
<p>In 2010, there were 311 middle schools in Virginia. In 2016, there were 306. By what percent did the number of middle schools in Virginia decrease from 2010 to 2016?</p>	<p>Jake used to live 10 miles from school. After he and his family moved, he now lives 18 miles from school. What is the percent of change in distance from Jake's old house to his new one?</p>
<p>Olivia scored 82 points on the first mathematics test of the year. On the second mathematics test, she scored 78 points. What is the percent of change in the number of points she scored between the first and second tests?</p>	<p>What is the percent of change in the cost of a DVD set that originally sold for \$49.99 and is now on sale for \$24.99?</p>
<p>In Richmond, Virginia, the average daily high temperature was 90°F for July. The average daily low temperatures for the same month was 69°F. What is the percent change between the high and low temperatures in July?</p>	<p>Last week, Jennifer volunteered at the hospital for 12 hours. This week, she volunteered for 15 hours. What is the percent increase in the number of hours she worked?</p>
<p>Stock in Company ABC went from \$26 a share to \$14 a share. What is the percent of change in the price of a share of stock in the company?</p>	<p>The average cost of a gallon of gasoline in Virginia Beach is \$2.479. The average cost of a gallon of gasoline in Richmond is \$2.462. What is the percent of change in the average cost of a gallon of gasoline from Virginia Beach to Richmond?</p>