

Enhancing Purposeful Learning in an Online Course Through the Use of Problem Solving Strategies and Real Life Applications

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Calculating Percentage of Change Problems: These are example problems using different formats, but involving the same mathematical concept (i.e., calculating percentage of change); the textbook problem comes from the OER, while the real life application problem was designed specifically for the course. The course uses both types of problems. The table below shows the similarities and differences between the two problem formats:

Aspect	Type of Problem Format	
	Textbook Problem	Real Life Application
Skill Building	Yes	Yes
Problem Scenario/ SetUp	Generic, objective scenario.	Personalized scenario written from the perspective of the student (i.e., “Your business...”). This provide a real life context that, in this case, a business student may encounter in his/her professional life, thereby building relevancy .
Data Used in Problem	Hypothetical, made up	Uses real data that is relevant to the problem and may be used if this were an actual situation. Includes citation of data source.
Conclusion/ Recommendation from Answer	No use of answer to make recommendation	Asks students to use obtained answer to make a recommendation, so they can see how it would be used in a real life decision making process. Recommendation may differ from student to student as would reflect real life decision making with data.

The real life applications help students to see how mathematical and statistical concepts are relevant to their professional and/or personal lives. The aim is to increase transferability of career-relevant skills by enhancing relevancy of mathematical and statistical concepts.

Example Problems Using Calculating Percentage of Change:

Textbook Problem Used for Skill Building

33. Student enrollments at a university increased from 8900 to 10,502. Find the percent increase of the student enrollments at the university.

Real Life Application Used for Skill Building and Increased Relevancy

Your business is planning to open additional branches in the Mid-Atlantic region. This region often includes New York, New Jersey, Pennsylvania, Delaware, Maryland, Washington, D.C., Virginia, and West Virginia. You want to place stores in states, where there has been population growth, to help ensure a steady supply of customers.

The population estimates for the 8 Mid-Atlantic states and District of Columbia are listed in the table below:

(http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP_2015_PEPAN_NRES&src=pt)

State	Population Estimate (as of July 1)	
	2010	2015
New York	19,402,920	19,795,791
New Jersey	8,803,881	8,958,013
Pennsylvania	12,712,014	12,802,503
Delaware	899,791	945,934
Maryland	5,788,409	6,006,401
Washington, D.C.	605,126	672,228
Virginia	8,025,787	8,382,993
West Virginia	1,854,225	1,844,128

The percentage change in population between 2010 and 2015 is defined as:

$$\frac{\text{population in 2015} - \text{population in 2010}}{\text{population in 2010}} * 100\%$$

- a. What is the percentage change in population between 2010 and 2015 for West Virginia? Round your answer to the nearest whole percent. Based on this answer, would you recommend opening a store in West Virginia?