

Economic Investigations

Investigation #7: Inflation:
Are Higher Prices the Only Problem?



There Is More to the Story



Junior Achievement®



Economic Investigations: There Is More to the Story

“Economic Investigations: There Is More to the Story” was a National Science Foundation funded project, which began in September 2003. The Social Science Education Consortium (SSEC) of Boulder, Colorado, was the grantee agency. James Davis, Executive Director of the SSEC, was the project director, and Donald Wentworth, Professor Emeritus of Pacific Lutheran University, was project co-director.

The overall project goal was to help students achieve a deeper understanding of puzzling economics questions so they could explain and provide thorough, supported, and justifiable accounts of economic phenomena, facts, and data. Three objectives guided project development:

- Create a classroom laboratory orientation for the investigations similar to those students would encounter in a laboratory science course.
- Develop quantitative skills in students—more so than they would acquire in a standard high school economics course.
- Focus the investigations on intriguing economics questions to spark student and teacher interest.

The Investigations

Twelve investigations were created by teams of economics curriculum materials developers and high school economics teachers. The titles of each investigation identify its content area followed by the main question addressed in the investigation. The investigation titles are:

Microeconomic Investigations

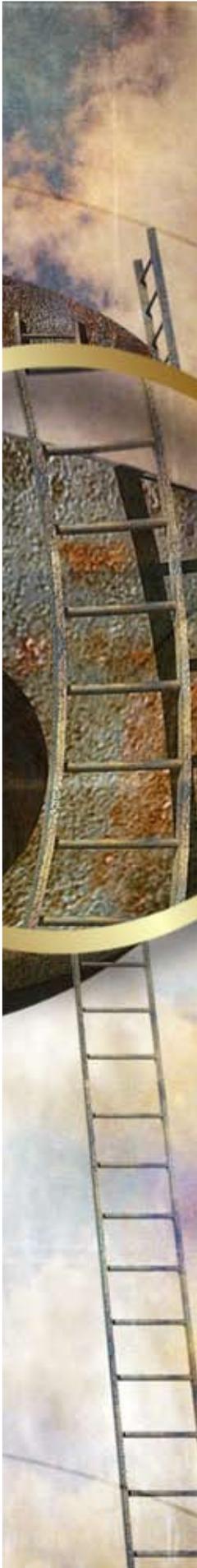
1. Women’s Wages: Do Women Earn Less Money Than Men?
2. Organ Transplants: Where Are the Missing Kidneys?
3. Minimum Wage: Does Raising the Rate Help Younger Workers?
4. Poverty: How Can a Family Be in Poverty and Not Be Poor?
5. Health Care: Who Should Pay the Cost?

Macroeconomic Investigations

6. Performance of the National Economy: How Do We Measure the Economy’s Health?
7. Inflation: Are Higher Prices the Only Problem?
8. Employment and Unemployment: How Can Both Rates Rise at the Same Time?
9. Fiscal Policy: Can Congress Diagnose and Treat an Ailing Economy?
10. Monetary Policy: Can the Federal Reserve Diagnose and Treat an Ailing Economy?

International Investigations

11. African-U.S. Trade: What’s in It for Africa?
12. Imports: Does American Employment Decline Because of International Trade?



Investigation and Field Test Results

The investigations were field-tested by high school teachers in the spring semesters of 2004 and 2006. Field test locations included Jefferson County Colorado; Milwaukee, Wisconsin; Sioux Falls, South Dakota; Scottsdale/Mesa, Arizona; and Plano, Texas. Based on this field test, the investigations were found to promote deeper student understanding of economic issues through the use of effective instructional methods. Students acknowledged that they learned a great deal from the investigations and teachers stated they would recommend the investigations to other teachers.

Cooperative Publishing Agreement

The Social Science Education Consortium has transferred the copyright of these investigations to JA Worldwide. JA Worldwide is making them available to teachers by posting them on the JA Worldwide website (www.ja.org) and distributing them in CD-ROM format. The investigations also will be posted on the SSEC website (www.socialscience-ed.org). Ultimately, the investigations will support the revised Junior Achievement high school program, JA Economics.

Authorship and Consultants

The project was fortunate to have an excellent group of authors and consultants. These individuals are listed below.

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The project evaluator was William Walstad, Professor of Economics, University of Nebraska, Lincoln.

Nancy Baldrice, Excelsior, Minnesota, served in an editorial and desktop-publishing capacity on the project.



Field-Test Teachers

Below are the teachers who completed field tests during the second year of the project.

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Investigation #7:

Inflation: Are Higher Prices the Only Problem?

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Investigation #7: Inflation: Are Higher Prices the Only Problem?

Introduction

Inflation

Inflation typically is defined as a sustained increase in a nation's average price levels. Students are taught to measure it by calculating changes in the Consumer Price Index (CPI) and the Gross Domestic Product (GDP) Deflator. However, higher prices are not the only result of inflation. Inflation affects the value of a nation's currency and arbitrarily redistributes national income. In turn, each of these conditions influences consumers' buying decisions, which affect overall economic performance.

Student Comprehension

This investigation helps students examine the issues related to inflation:

- What happens to income distribution?
- What happens to the value of currency?

In this investigation, students are asked to measure changes in average price levels. They also are required to analyze consumer behavior as groups and individuals adjust to inflation, and to investigate the incentives influencing that behavior.

Concepts

Inflation
Consumer Price Index (CPI)
Gross Domestic Product (GDP) Deflator
Currency valuation
Income redistribution
Consumer behavior

Objectives

After completing this investigation, students will be able to

- Define inflation.
- Explain how inflation is measured, using either the CPI or the GDP Deflator.
- Describe how inflation causes the value of currency to decline.
- Calculate changes in income redistribution caused by to inflation.
- Predict how people might respond to inflationary changes in the economy.



Economic Principles

The arbitrary redistribution of purchasing power associated with unexpected inflation imposes financial hardship on people with fixed incomes. Because individuals and organizations must use resources to protect themselves against the uncertainty of future prices, inflation can reduce the growth rate of national living standards. However, not everyone in the economy is affected negatively by inflation. People whose incomes increase at a faster rate than inflation benefit during periods of inflation.

Investigation

Description

This investigation begins with a discussion of spare change. Students are asked to compare and analyze peoples' attitudes toward coins today to those of the past. Students then complete an activity that teaches them how to compare current monetary values with past values. A second activity leads students through a real-world example of how monetary values affect individual paychecks. The investigation concludes with a review of peoples' attitudes and behavior about spare change.

Time required: 100 minutes

Technology: This investigation contains an optional Internet computer search activity.

Materials

U.S. Cents	10-20 pennies
Visual #1	Inflation: What is it? How is It Calculated?
Visual #2	A Real-World Example: Inflation in the United States
Activity #1	Calculating Inflation Using the GDP Deflator
Activity #2	Inflation and Currency Value
Activity #3	Inflation and Income Redistribution
Activity #4	Checking for Real-World Evidence

Procedure

1. Tell students this investigation will examine inflation and why people today, including teenagers, have lots of money they don't use.
2. Throw pennies on the classroom floor (10-20 cents). Explain it has been sitting in your change jar for a long time, and you've decided to get rid of it.
3. Ask students if they or someone in their family has a change jar for collecting spare coins. Also ask if they would stop to pick up a penny or a nickel from the sidewalk.
4. Describe to students how their behavior would have been very different 40 years ago. People used pennies and nickels. They did not leave them in change jars, and they picked up money that was lying on the sidewalk.
5. Ask students why they think people today behave differently toward coins than they did 40 years ago. Pose the question, "Are we so rich that money means nothing to us anymore?" Write students' answers on the board or post in a visible place for later review.

6. Explain to students that they may be better able to answer this question after they have studied inflation and its consequences.
7. Display **Visual #1 – Inflation: What is it? How is it Calculated?** Review with students the definition of “inflation” and how it is calculated. If textbooks are available to the class, this information will be available in that resource. 8. Hand out **Activity #1 – Calculating Inflation Using the GDP Deflator.** Ask students to answer the questions and calculate the change in percentage rate from year #1 to year #2.

Answers to Activity #1 – Calculating Inflation:

Year #1

Bikes x 100,000 x \$100	=	\$10 Million
Oranges x 10M x \$.10	=	\$ 1 Million
<u>Airplanes x 10 x \$1M</u>	=	<u>\$10 Million</u>
Total		\$21 Million

Year #2 (Nominal GDP)

Bikes x 100,000 x \$120	=	\$12 Million
Oranges x 10M x \$.20	=	\$ 2 Million
<u>Airplanes x 10 x \$1.1M</u>	=	<u>\$11 Million</u>
Total		\$25 Million

Year #2 (Real GDP)

(Year #1 prices x Year #2 Output, using Year #1 as the base year for prices)

Bikes x 100,000 x \$100	=	\$10 Million
Oranges x 10M x \$.10	=	\$ 1 Million
<u>Airplanes x 10 x \$1M</u>	=	<u>\$10 Million</u>
Total		\$21 Million

$$\text{GDP Deflator} = \frac{\text{Nominal GDP year \#2}}{\text{Real GDP year \#2}} \times 100$$

(Year #1 is considered the base year in this example. In an index, base years are equal to 100.)

To calculate the GDP deflator for year #2:

$$\frac{\text{Nominal GDP year \#2}}{\text{Real GDP year \#2}} \times 100 = \frac{25}{21} \times 100 = 119$$

To calculate the inflation rate:

(Inflation is equal to the percentage change in the index number from year #1 to year #2. It always is expressed as a percentage change.)

$$\frac{(\text{GDP deflator year 2}) - (\text{GDP deflator year 1})}{(\text{GDP deflator year 1})} \times 100 = \frac{(119 - 100)}{100} \times 100 = .19 \times 100 = 19\%$$





9. Show students **Visual #2 – A Real-World Example: Inflation in the United States**. This visual calculates the inflation rate from 2000 to 2001, using statistics from the Economic Report of the President 2003.
10. Explain to students that inflation results in more than high prices. There are two more parts to the story. Part 1 deals with the value of money. Remind them of the money on the floor and sitting in change jars. Tell them that calculating currency values will help explain why we leave money “lying around” today.
11. Hand out **Activity #2 – Inflation and Currency Value**. Explain that this worksheet will help them discover what happens to money during inflation.

Answers to Activity #2 – Inflation and Currency Value:

Question #1

Imagine a situation where most of your income is spent on food, specifically hamburger. You earn \$10 per day, and you spend \$5 on hamburger. What percent of your income is spent on hamburger?

$$\frac{\$5 \text{ hamburger cost}}{\$10 \text{ income}} = 50\%$$

Question #2

Next imagine that all prices double. You are an average person in the economy, so when the average price level doubles, your income also doubles. Hamburger prices will also double. What percent of your income is spent on hamburger?

$$\frac{\$10 \text{ hamburger cost}}{\$20 \text{ income}} = 50\%$$

Question #3

Are you richer or poorer as a result of inflation?

Answer: You are neither richer nor poorer, because your purchasing power has stayed the same. You still only use one-half of your income to buy food.

The Rest of the Story

What has happened to the value of each dollar you hold?

In Question #1, how much hamburger did \$1 buy?

Answer: 1/5 of a hamburger

In Question #2, how much hamburger did \$1 buy?

Answer: 1/10 of a hamburger

What has happened to the purchasing power of each dollar bill?

Answer: It has declined. One dollar bill buys half of what it could buy before inflation.



Question #4

Why do people have so much spare change lying around these days? Why don't they use it to buy valuable goods and services? How can this behavior be explained?

Answer: Coins are not very valuable now. 1-cent pieces, nickels, dimes, and quarters do not have as much purchasing power as before. For example, in the 1960s, one dime could buy one soft drink. In 2004, one dime might buy 1/10 of a soft drink.

(Note to the Teacher: If you wish to use two class periods for this investigation, this would be a good stopping point.)

12. Summarize what students have learned in Part 1: that money becomes less valuable during periods of inflation. Tell them that in Part 2, it will be their task is to investigate the rest of the story.
13. Tell students they must be aware of some important relationships while doing their investigations.
 - Average price changes do not alter a country's ability to produce real goods and services. Real resources, like land, labor, and capital, remain available for use to produce goods and services.
 - GDP measures both the total costs of production and the total income of producers. Since everyone's cost is someone else's income, GDP can be measured as either costs or incomes. The results will be the same.
14. Ask students to imagine a small economy with only five citizens. This economy is described in **Activity #3 – Inflation and Income Redistribution**. Have them calculate the consequences of inflation by using the worksheet. They should observe that a redistribution of income takes place by moving real purchasing power from people with inflexible incomes to people with flexible incomes.

Answers to Activity #3 – Inflation and Income Redistribution:

Five people live in this economy. In year #1, the GDP Deflator was equal to 100. All five of the residents earned \$50,000 as income. What was the Nominal GDP of the country?

A teacher with a three-year contract (this is one-year's earnings)	\$50,000
A professional soccer player with a three-year contract	\$50,000
A real estate sales person who earns income on commission	\$50,000
A retiree whose income includes cost-of-living raises (COLA)	\$50,000
A computer consultant who negotiates a fee with each contract	<u>\$50,000</u>

Nominal GDP equals \$250,000



In year #2, no changes occurred in the economy, except that prices doubled. The GDP deflator is now equal to 200. Therefore, the Nominal GDP also will double (everyone's higher cost is someone else's higher income). What will happen to the individual incomes? Remember, some incomes cannot change because of multi-year contracts. Incomes with COLA (Cost of Living Allowance) will change at the same rate as inflation.

A teacher with a three-year contract (this is one-year's earnings)	\$50,000
A professional soccer player with a three-year contract	\$50,000
A real estate sales person who earns income on commission	\$150,000
A retiree whose income includes cost-of-living raises (COLA)	\$100,000
A computer consultant who negotiates a fee with each contract	<u>\$150,000</u>

Nominal GDP equals \$500,000

Given the above information, what has been the consequence of inflation?

Answer: When nominal GDP doubled, the income distribution of the five people became much different. The teacher and the soccer player had the same income as they had in year #1, meaning that their purchasing power was reduced by half. Both the real estate person and the computer consultant received a three-fold increase in their income, making them both better off. The retiree's income increased at the same percentage as prices, so the retiree's real income was the same as in year #1.

15. **Optional Activity:** This activity involves an internet search by computer, wherein students use governmental data as evidence for investigating the impact of inflation on different individuals in the economy. Teachers without access to computer equipment could provide students with the data listed in the answer key on page 10 of the investigation plan, then students could calculate the answers to the column "Rent as a percent of salary". Explain to students that hypothetical examples are helpful for learning abstract ideas, but economists like to check their theories with evidence. Hand out **Activity #4 – Checking for Real-World Evidence**, and have students search the Internet for data to answer questions.

Note to the Teacher: There are four specific sites where students should find evidence:

1. Social Security information is found at <http://www.ssa.gov/OACT/COLA/colaseries.html> and www.ssa.gov/OACT/COLA/SSlamts.html.
2. Minimum wage history information is found at www.dol.gov/esa/minwage/chart.htm.
3. Consumer price information is found at <http://data.bls.gov/servlet/Survey> in the Department of Labor statistics.

Answers to Activity #4 – Checking for Real-World Evidence

The Tale of Two Paychecks: The Impact of Inflation on Fixed and Flexible Incomes



Directions: It is your task to use the statistics on inflation, minimum-wage rates, and Social Security (SS) payments to measure the impact of inflation on the purchasing power of two consumers. The years for investigation are 1981-1989. Your data sources are the websites for the Economic Report of the President (www.access.gpo.gov/eop), Social Security Online (www.socialsecurity.gov) and/or the Bureau of Labor Statistics (www.bls.gov/data/home.htm). The information on the CPI and the percentage change in the CPI (the rate of inflation) has been provided in the chart below.

Consumer #1: Marie

Marie worked at the same minimum-wage job for 9 years. She worked an average of 40 hours per week for 50 weeks, for a total of 2,000 hours per year. During that 10-year span, she lived in the same apartment. In 1981, the apartment rent was \$100 per month. The landlord checked the inflation rate each year, and increased the rent on the first of the year by the amount of the previous year's inflation rate. Answer the following questions to find out the impact of inflation on the purchasing power of Marie's yearly income.

Question #1 What was Marie's hourly wage in 1981? Enter your answer in the table below. (\$3.35)

[Hint: Use the Internet or other resources to find the value of the minimum wage from 1981 to 1989. Look for this information at <http://www.dol.gov/esa/minwage/chart.htm>.]

Question #2 What was Marie's annual income in 1981? Enter your answer in the table below. (\$6,700)

[Hint: Multiply the hourly wage by 2,000.]

Question #3 What was Marie's hourly wage in each of the years from 1981 to 1989? Fill in the rest of the column. (\$3.35)

Question #4 What was Marie's annual income for each of the years from 1981 to 1989? Fill in the rest of the column. (\$6,700)

[Hint: Multiply the hourly wage by 2,000.]

The CPI and CPI percentage change increase per year are provided in your worksheet. Use these numbers to answer the following questions.

Question #5 What was Marie's annual rent for each of the years from 1981 to 1989? Enter your answers in the table below. (See answers in the table on page 8.)

[Hint: Annual rent is monthly rent times 12. Annual rent increased by the same percentage as the increase in the CPI.]



Question #6 What percentage of Marie's annual income was required to pay her rent for each of the years from 1981 to 1989? Enter your answers in the table below. (See answers in the table on page 8.)

[Hint: Divide rent by annual income, and express your answer as a percentage.]

Question #7 How might Marie have had to change her spending on food, clothing, or things other than rent over these years?

Hint: Compare Marie's income and her rent for each of the years. (Marie would have to spend more on her apartment as a percent of her income so she would have to reduce her spending on other items.)

Consumer #2: Archie

Archie retired on January 1, 1981, at age 65, and began drawing his full Social Security benefits. He had no other sources of income in retirement. Each January, the Social Security payment was changed by the Social Security Administration to adjust for inflation. The changes in the payments are listed at the following websites:

<http://www.ssa.gov/OACT/COLA/SSIamts.html>

<http://www.ssa.gov/OACT/COLA/colaseries.html>

He continued to draw Social Security payments until December 31, 1989. He rented the same apartment for those years. In 1981, the apartment rent was \$100 per month. The landlord checked the inflation rate each year, and increased the rent on the first of the year by the amount of the previous year's inflation rate. On January 1, 1989, he won the \$100 million Lottery, donated his SS check to charity, and bought a mansion in Tahiti.

Question #1 If Archie received the average-sized Social Security check, how much did he receive in his first check? Enter your answer in the table below. (\$264.70)

[Hint: Use the following website to find the amount paid to an eligible individual in 1981 (www.ssa.gov/OACT/COLA/SSIamts.html).]

Question #2 What was Archie's annual income in 1981? Enter your answer in the table below. (\$3,176.40)

[Hint: Multiply monthly income by 12.]

Question #3 What was Archie's annual rent for each of the years from 1981 to 1989? Enter your answers in the table below. (See answers in the table below.)

[Hint: Annual rent is monthly rent times 12. Annual rent increased by the same percentage as the increase in the CPI of the previous year.]



Question #4 What percentage of Archie's annual income was required to pay his rent for each of the years from 1981 to 1989? Enter your answers in the table below. (See answers in the table on next page.)
[Hint: Divide rent by annual income, and express your answer as a percentage.]

Question #5 How might Archie have had to change his spending on food, clothing, or things other than rent over these years?
[Hint: Compare Archie's income and his rent for each year. Archie paid about the same percentage for his apartment annually because his Social Security check was adjusted by the SSA to compensate for inflationary price changes. He would have to make fewer changes in his spending behavior than would Marie.]

Marie						
	Hourly wage	Annual income	CPI	CPI increase	Annual rent	Rent as % of salary
1981	\$3.35	\$6,700	90.9		\$1,200	17.9
1982	\$3.35	\$6,700	96.5	6.1	\$1,273.20	19.0
1983	\$3.35	\$6,700	99.6	3.2	\$1,313.94	19.6
1984	\$3.35	\$6,700	103.9	4.3	\$1,370.44	20.5
1985	\$3.35	\$6,700	107.6	3.5	\$1,418.41	21.2
1986	\$3.35	\$6,700	109.6	1.9	\$1,445.35	21.6
1987	\$3.35	\$6,700	113.6	3.7	\$1,498.83	22.4
1988	\$3.35	\$6,700	118.3	4.1	\$1,560.28	23.3
1989	\$3.35	\$6,700	124.0	4.8	\$1,635.17	24.4
Archie						
	Monthly income	Annual income	CPI	CPI increase	Annual rent	Rent as % of salary
1981	\$264.70	\$3,176.40	90.9		\$1,200	37.8
1982	\$284.30	\$3,411.60	96.5	6.1	\$1,273.20	37.3
1983	\$304.30	\$3,651.60	99.6	3.2	\$1,313.94	36.0
1984	\$314.00	\$3,768.00	103.9	4.3	\$1,370.44	36.4
1985	\$325.00	\$3,900.00	107.6	3.5	\$1,418.41	36.4
1986	\$336.00	\$4,032.00	109.6	1.9	\$1,445.36	35.85
1987	\$340.00	\$4,080.00	113.6	3.7	\$1,498.84	36.74
1988	\$354.00	\$4,248.00	118.3	4.1	\$1,560.29	36.73
1989	\$368.00	\$4,416.00	124.0	4.8	\$1,635.18	37.03

16. Explain to students that income redistribution changes the incentives that influence individual choices. Ask them to anticipate how people might change their behavior if they think inflation will increase rapidly in the next two years.

Answer: Expected inflation creates an incentive for people to increase spending and borrowing. If they buy now at relatively low prices rather than wait for higher prices in the future, they have more purchasing power. If they borrow relatively more valuable dollars now, they can pay them back with relatively less valuable dollars in the future.

People might also move into other professions where they think their income will rise fast enough to protect their purchasing power, or engage in side occupations to protect their ability to buy goods and services.



Closure

Ask students to summarize the main points of the investigation on inflation.

- What is inflation?
- What are its important consequences?

Answer:

- Inflation is a sustained increase in the average of all prices in the economy.
- It causes problems in the economy because it redistributes income from people with fixed or rigid incomes to people with flexible incomes.
- It makes the currency of the economy less valuable.
- The decline in the value of the currency reduces the purchasing power of a fixed income.

ANSWER KEY

Multiple Choice (3)

(Answers are shown in bold.)

1. What happens to average income in an economy when it experiences unexpected periods of inflation?
 - a. Average income drops.
 - b. Average income falls.
 - c. Average income remains the same.**
 - d. Inflation and average income are unrelated.

2. Which of the following people would be likely to suffer reduced purchasing power during periods of unexpected inflation?
 - a. Workers earning the minimum wage.
 - b. Professional baseball players with 10-year contracts at \$10M per year.
 - c. Retired pipe fitters whose pension is set at 70 percent of their last year's wage.
 - d. All of the above individuals will suffer reduced purchasing power.**

3. Imagine you are a person just graduating from trade school with a debt of \$10,000 in student loans and a 10-year period to pay off the loans. You have accepted an excellent job offer to work as a mechanic on large equipment (like bulldozers and other earth-moving machinery). The job offer includes a cost-of-living raise so you will not lose purchasing power from inflationary changes. Under which of the following situations should you pay off your loans early?
 - a. Your loan requires you to pay 5 percent per year, and you think inflation will be 10 percent every year.
 - b. Your loan requires you to pay 5 percent per year, and you think inflation will be 8 percent per year.
 - c. Your loan requires you to pay 5 percent per year, and you think you can earn 15 percent by investing in the stock market.
 - d. Your loan requires you to pay 5 percent per year, and you think inflation will be 1 percent each year for the next 10 years.**

ANSWER KEY

Essay (2)

1. Respond to the following statement. Is it correct? Does it tell the whole story?
“Inflation is a silly concern. It just causes numbers to get larger, but it doesn’t change the economy. It doesn’t matter if the average price level goes up, because the average income level has to go up by an equal amount.”

Answer: The statement is partially correct, but the analysis is incomplete. Average incomes rise with inflation, but individuals suffer arbitrary income redistribution. This problem prompts people to protect themselves against inflation by investing differently or changing jobs. These actions change the economy and its output. (See answer to teacher procedure 16.)

2. Respond to the following statement. Does it accurately reflect the problems of inflation?
“People shouldn’t be concerned about inflation. So what if a few prices go up? Not all prices will rise.”

Answer: The statement does not accurately reflect the problems of inflation. Although not all prices will rise, inflation is a sustained rise in the average of all prices in the economy. It is not just a few prices going up. Inflation can erode the purchasing power of people whose incomes do not increase as fast as or faster than the rate of inflation.

ANSWER KEY

Open-Ended Assessment (4)

(The correct answer to each question is false.)

Ask each student to poll four adults about the following inflation misconceptions. Have them pool and summarize their data, and present it in graph form.

1. Inflation occurs whenever a consumer notices prices rising on some products.
2. Inflation is difficult for consumers because they have no alternative but to pay higher prices.
3. Inflation presents no problem for the rich. They can buy whatever they want, no matter what the price.
4. Currency is more valuable during inflation because you need more money to pay for higher prices.

Investigation #7 – Assessment #1

Multiple Choice (3)

1. What happens to average income in an economy when it experiences unexpected periods of inflation?
 - a. Average income drops.
 - b. Average income falls.
 - c. Average income remains the same.
 - d. Inflation and average income are unrelated.

2. Which of the following people would be likely to suffer reduced purchasing power during periods of unexpected inflation?
 - a. Workers earning the minimum wage.
 - b. Professional baseball players with 10-year contracts at \$10M per year.
 - c. Retired pipe fitters whose pension is set at 70 percent of their last year's wage.
 - d. All of the above individuals will suffer reduced purchasing power.

3. Imagine you are a person just graduating from trade school with a debt of \$10,000 in student loans and a 10-year period to pay off the loans. You have accepted an excellent job offer to work as a mechanic on large equipment (like bulldozers and other earth-moving machinery). The job offer includes a cost-of-living raise so you will not lose purchasing power from inflationary changes. Under which of the following situations should you pay off your loans early?
 - a. Your loan requires you to pay 5 percent per year, and you think inflation will be 10 percent every year.
 - b. Your loan requires you to pay 5 percent per year, and you think inflation will be 8 percent per year.
 - c. Your loan requires you to pay 5 percent per year, and you think you can earn 15 percent by investing in the stock market.
 - d. Your loan requires you to pay 5 percent per year, and you think inflation will be 1 percent each year for the next 10 years.

Investigation #7 – Assessment #2

Essay (2)

1. Respond to the following statement. Is it correct? Does it tell the whole story?

“Inflation is a silly concern. It just causes numbers to get larger, but it doesn’t change the economy. It doesn’t matter if the average price level goes up, because the average income level has to go up by an equal amount.”

2. Respond to the following statement. Does it accurately reflect the problems of inflation?

“People shouldn’t be concerned about inflation. So what if a few prices go up? Not all prices will rise.”

Investigation #7 – Assessment #3

Open-Ended Assessment (4)

Directions: Ask four adults whether they believe the following statements are true or false. Pool and summarize your data, and present it in graph form.

1. Inflation occurs whenever a consumer notices prices rising on some products.
2. Inflation is difficult for consumers because they have no alternative but to pay higher prices.
3. Inflation presents no problem for the rich. They can buy whatever they want, no matter what the price.
4. Currency is more valuable during inflation because you need more money to pay for higher prices.

Inflation: What is it? How is it Calculated?

- Inflation is a sustained rise in the average price of all goods and services in an economy.
- The average price level is measured in two ways:

The Consumer Price Index (CPI)

measures the cost of a fixed basket of consumer goods and services and compares the basket cost to a base period.

The GDP Deflator

measures changes across all products included in the Gross Domestic Product.

A Real-World Example: Inflation in the United States

2000 U.S. GDP Deflator = 106.89

2001 U.S. GDP Deflator = 109.42

$$\text{Inflation rate} = \frac{(109.42 - 106.89)}{106.89} \times 100 = 2.36\%$$

Which is rounded to 2.4%

Source: Economic Report of the President 2003

Investigation #7 – Activity #1

Directions: Read the following material, and use the formula to measure inflation in this hypothetical example of a small economy. Remember that Nominal GDP is calculated without adjusting for price changes. Real GDP is calculated by adjusting out price changes, thereby “deflating” the number. Check your textbook for a more complete explanation of these two concepts.

Calculating Inflation Using the GDP Deflator

- Year #1
 - Bikes x 100,000 x \$100 = \$10 Million
 - Oranges x 10M x \$.10 = \$ 1 Million
 - Airplanes x 10 x 1M = \$10 Million
 - Total \$21 Million
- Year #2 (Nominal GDP)
 - Bikes x 100,000 x \$120 = \$12 Million
 - Oranges x 10M x \$.20 = \$ 2 Million
 - Airplanes x 10 x \$1.1M = \$11 Million
 - Total \$25 Million
- Year #2 (Real GDP)
 - Bikes x 100,000 x \$100 = \$10 Million
 - Oranges x 10M x \$.10 = \$ 1 Million
 - Airplanes x 10 x 1M = \$10 Million
 - Total \$21 Million

$$\text{GDP Deflator} = \frac{\text{Nominal GDP year \#2}}{\text{Real GDP year \#2}} \times 100$$

(Year #1 is considered the base year in this example.
In an index, base years are equal to 100.)

Investigation #7 – Activity #1 (page 2)

Question #1:

- What is the GDP deflator number for year #2? _____

Use this formula to calculate the GDP deflator for year #2:

$$\frac{\text{Nominal GDP year \#2}}{\text{Real GDP year \#1}} \times 100 = \text{GDP deflator number for year \#2}$$

Question #2:

- What was the percentage level of inflation for year #2? _____

Remember:

- It is equal to the percentage change in the index number from year #1 to year #2.
- Inflation is always expressed as a percentage change.

Use this formula to calculate the inflation rate for year #2:

$$\frac{(\text{GDP deflator year \#2} - \text{GDP deflator year \#1})}{\text{GDP deflator year \#1}} \times 100 = \text{inflation rate for year \#2}$$

Inflation and Currency Value

Question #1: Imagine a situation where most of your income is spent on food, specifically hamburger. You earn \$10 per day, and you spend \$5 on hamburger. What percent of your income is spent on hamburger?

Question #2: Next, imagine that all prices double. You are an average person in the economy, so when the average price level doubles, your income also doubles. Hamburger prices also will double. What percent of your income is spent on hamburger?

Question #3: Are you richer or poorer as a result of inflation?

The Rest of the Story

What has happened to the value of each dollar you hold?

In Question #1, how much hamburger did \$1 buy? _____

In Question #2, how much hamburger did \$1 buy? _____

What has happened to the purchasing power of each dollar bill? _____

Question #4: Why do people have so much spare change lying around these days? Why don't they use it to buy valuable goods and services? How can this behavior be explained?

Inflation and Income Redistribution

Five people live in this economy. In year #1, the GDP Deflator was equal to 100. Each person earned \$50,000 as income. Calculate the Nominal GDP of this country.

A teacher with a three-year contract (this is one-year's earnings)	\$50,000
A professional soccer player with a three-year contract	\$50,000
A real estate sales person who earns income on commission	\$50,000
A retiree whose income includes cost-of-living raises (COLA)	\$50,000
A computer consultant who negotiates a fee with each contract	<u>\$50,000</u>

Nominal GDP equals _____

In year #2, no changes occurred in the economy, except that prices doubled. The GDP deflator is now equal to 200. Therefore, the Nominal GDP also will double. (Everyone's higher cost is someone else's higher income.) What will happen to individual incomes? Remember some incomes cannot change because of multi-year contracts. COLA incomes will change by the same percentage amount as the inflation rate.

A teacher with a three year contract (this is one-year's earnings)	\$50,000
A professional soccer player with a three-year contract	\$50,000
A real estate sales person who earns income on commission	\$150,000
A retiree whose income includes cost of living raises (COLA)	\$100,000
A computer consultant who negotiates a fee with each contract	<u>\$150,000</u>

Nominal GDP equals _____

Question: Given the above information, what has been the consequence of inflation? _____

Checking for Real-World Evidence

The Tale of Two Paychecks:

The Impact of Inflation on Fixed and Flexible Incomes

Directions: It is your task to use the statistics on inflation, minimum-wage rates, and social security (SS) payments to measure the impact of inflation on the purchasing power of two consumers. The years for investigation are 1981-1989. Your data sources are the websites for the Economic Report of the President (www.access.gpo.gov/eop), Social Security Online (www.socialsecurity.gov) and/or the Bureau of Labor Statistics (www.bls.gov/data/home.htm). The information on the CPI and the percentage change in the CPI (the rate of inflation) is provided in the chart located at the end of this activity.

Consumer #1: Marie

Marie worked at the same minimum wage job for 9 years. She worked an average of 40 hours per week for 50 weeks, for a total of 2,000 hours per year. During that 10-year span, she lived in the same apartment. In 1981, the apartment rent was \$100 per month. The landlord checked the inflation rate each year, and increased the rent on the first of the year by the amount of the previous year's inflation rate. Answer the following questions to find out the impact of inflation on the purchasing power of Marie's yearly income.

- Question #1** What was Marie's hourly wage in 1981? Enter your answer in the table below.
[Hint: Use the Internet or other resources to find the value of the minimum wage from 1981 to 1989. Look for this information at <http://www.dol.gov/esa/minwage/chart.htm>.]
- Question #2** What was Marie's annual income in 1981? Enter your answer in the table below.
[Hint: Multiply the hourly wage by 2,000.]
- Question #3** What was Marie's hourly wage in each of the years from 1981 to 1989? Fill in the rest of the column.
- Question #4** What was Marie's annual income for each of the years from 1981 to 1989? Fill in the rest of the column.
[Hint: Multiply the hourly wage by 2,000.]

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The CPI and CPI percentage change increase per year are provided in your worksheet. Use these number to answer the following questions.

- Question #5** What was Marie’s annual rent for each of the years from 1981 to 1989? Enter your answers in the table below.
[Hint: Annual rent is monthly rent times 12. Annual rent increased by the same percentage as the increase in the CPI.]
- Question #6** What percentage of Marie’s annual income was required to pay her rent for each of the years from 1981 to 1989? Enter your answers in the table below.
[Hint: Divide rent by annual income, and express your answer as a percentage.]
- Question #7** How might Marie have had to change her spending on food, clothing, or things other than rent over these years?
[Hint: Compare Marie’s income and her rent for each of the years.]

Consumer #2: Archie

Archie retired on January 1, 1981, at age 65, and began drawing his full Social Security benefits. He had no other sources of income in retirement. Each January, the Social Security payment was changed by the Social Security Administration to adjust for inflation. The changes in the payments are listed at the following websites:

<http://www.ssa.gov/OACT/COLA/SSIamts.html>

<http://www.ssa.gov/OACT/COLA/colaseries.html>

He continued to draw Social Security payments until December 31, 1989. He rented the same apartment for those years. In 1981, the apartment rent was \$100 per month. The landlord checked the inflation rate each year, and increased the rent on the first of the year by the amount of the previous year’s inflation rate. On January 1, 1989, he won the \$100 million Lottery, donated his SS check to charity, and bought a mansion in Tahiti.

- Question #1** If Archie received the average-sized Social Security check, how much did he receive in his first check? Enter your answer in the table below.
[Hint: Use the following website to find the amount paid to an eligible individual in 1981 (www.ssa.gov/OACT/COLA/SSIamts.html).]
- Question #2** What was Archie’s annual income in 1981? Enter your answer in the table below.
[Hint: Multiply monthly income by 12.]

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Question #3 What was Archie’s annual rent for each of the years from 1981 to 1989?
Enter your answers in the table below.
[Hint: Annual rent is monthly rent times 12. Annual rent increased by the same percentage as the increase in the CPI of the previous year.]

Question #4 What percentage of Archie’s annual income was required to pay his rent for each of the years from 1980 to 1988? Enter your answers in the table below.
[Hint: Divide rent by annual income, and express your answer as a percent.]

Question #5 How might Archie have had to change his spending on food, clothing, or things other than rent over these years?
[Hint: Compare Archie’s income and his rent for each of the years.]

Marie						
	Hourly wage	Annual income	CPI	CPI increase	Annual rent	Rent as % of salary
1981	\$3.35	\$6,700	90.9		\$1,200	17.9
1982			96.5	6.1		19.0
1983			99.6	3.2		19.6
1984			103.9	4.3		20.4
1985			107.6	3.5		21.2
1986			109.6	1.9		21.6
1987			113.6	3.7		22.4
1988			118.3	4.1		23.3
1989			124.0	4.8		24.0
Archie						
	Monthly income	Annual income	CPI	CPI increase	Annual rent	Rent as % of salary
1981	\$264.70	\$3,176.40	90.9		\$1,200	37.7
1982			96.5	6.1		37.3
1983			99.6	3.2		36.0
1984			103.9	4.3		36.3
1985			107.6	3.5		36.3
1986			109.6	1.9		38.5
1987			113.6	3.7		39.5
1988			118.3	4.1		39.5
1989			124.0	4.8		39.8