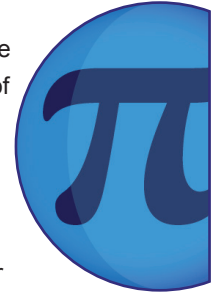




Could You Owe More Than America?

Key Learning Content

This film shows the effect of compound interest on a loan. Compound interest is interest charged on the amount you borrowed plus any previous interest already charged. The annual percentage rate (APR) of interest is defined. An example is given of a very high interest rate charged on short-term loans. The effect of this interest rate on a \$100 loan over seven years is shown year-by-year on screen, resulting in a debt bigger than the national debt of America.



The film is accessible to any student with a working knowledge of percentages, and will be of particular interest to those studying economics.

Core Outcomes

Learning Points

- Be able to use and apply number in everyday personal, domestic or community life.
- Be able to understand that 'percentage' means 'number of parts per 100'.
- Be able to solve simple percentage problems, including percentage increase and percentage decrease, e.g. find the interest charged after one year on \$3000 borrowed at 5% per annum.
- Be able to understand and apply the concept of compound interest.

Suggested Activities

- Work out the interest charged on loans of different terms at different APRs.
- Work out the interest paid on savings accounts over different periods at different APRs.
- Calculate the APR of a loan given the amount borrowed and the annual interest charged.

Extension Outcomes

Learning Points

- Be able to use index notation and index laws for multiplication of positive integer powers.
- Be able to understand the role of debt in government financing.
- Be able to understand the factors that influence the interest rate on a loan.

Suggested Activities

- Work out the monthly, weekly and daily rate of interest given the APR of interest.
- Research the amount of debt of different countries around the world.
- Research the relationship between interest rates and inflation over time.



Interest is usually a percentage of the capital amount, expressed as a yearly rate called the Annual Percentage Rate (APR).

Related Films

To use before the lesson plan:

The Most Populous Country

This film looks at how the relationship between large and larger can be expressed mathematically.

Percentages: Tax Breaks

This film explains the use of percentage income tax rates in raising government revenue.

To use after the lesson plan:

Hyperinflation: 1920s Germany

This film describes what happened when the German government printed money to pay off its debts.

The Emperor's Chess Board

This film relates the tale of a Chinese emperor who gave a reward that was doubled for every square in a chess board, resulting in a debt he could not afford.

Fractional Reserve Banking

This film explains how much banks can lend as a percentage of their deposits.

Guide Lesson Plan

Introduction

Ask students if they have ever lent money to a friend. If so, ask what interest rate they charged. Explore why banks charge interest on loans but friends tend not to do so. Ask what a reasonable rate of interest would be if they were to charge interest, and tabulate responses.

Show Film

Could You Owe More Than America?

Main Activity

Foundation

Split the students into pairs and give each pair a lending instruction: one student borrows from the other a set amount of money at a given interest rate for a specified period of time. Get both students to work out what the interest payments are for each time period and check that each gets the same answer. Then specify a repayment schedule, so that each period the amount outstanding increases by the amount of interest, but is then reduced by the repayment. Get pairs to work out the new interest payments until the loan is repaid.

Main Activity cont ...

Advanced

Show how to model a percentage increase as a decimal multiplier (so adding 20% is equivalent to multiplying by 1.2), then go over index notation and index laws for multiplication of positive integer powers. Show how to work out a monthly compound interest rate from an annual rate, or a daily rate from a monthly rate, and vice versa. Then set problems converting rates.

Extension Activity

Foundation






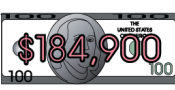


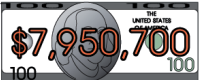
Tell students the amount borrowed and the interest charged in the first period of the loan, and then get them to work out the APR. For example, if Jill borrows £250 and pays £10 in the first month of the loan, what then is the APR?

Advanced

Tell students the amount borrowed and the total interest charged in the whole period of the loan then get them to work out the APR. For example, if Jack borrows £150 and pays a total of £6.06 interest over two years, what then is the APR?

Optional Extra

Research how the United States came to have its massive amount of debt. What interest rate does it typically pay on its debt? When do financial markets or economists expect the United States to repay its debt?

	Year one	Year two	Year three
Capital			
	+	+	+
	 × 42	 × 42	 × 42
	=	=	=
			

If you borrowed money with a high interest rate of over 4200%, each year you would be liable for interest 42 times the amount owed the previous year.