



# Junior Achievement \$ave, USA

## Money Doubles by the Rule of 72

### Middle School Lesson

Jack and Jill are twins. When he was 10 years old, Jack started to save \$20 a month. After 20 years, he stopped adding to his savings. Jill didn't start to save until she was 20. Then, she saved \$20 a month and kept adding to her savings until she retired 45 years later. They each earned 6% interest on their savings. Who had more money at the retirement age of 65?

Even though Jill saved for 45 years and Jack saved for only 20, at age 65 Jack had \$66,000 in his account compared to Jill's \$54,000. This seems like a paradox, something that seems the opposite of common sense. How can you save less and have more?

#### The answer is compound interest.

When you save money in a savings account — a certificate of deposit, a money market fund or other savings plan — you earn interest on the principal. The principal is the amount you already have in your account. When interest is compounded, you begin to earn interest not only on the principal, but on the earned interest as well.

Look at the table below, and notice how the interest amount increases each year, even though no additional deposits are made. That's because the interest is based on an increasing principal amount. As interest compounds, your money grows faster and faster.

You can calculate how fast your savings will increase by using the "Rule of 72." Divide 72 by the percent of interest your savings are earning. The answer is the number of years it will take to double your money. For example, if you earn 6% interest, your money will double in 12 years ( $72 \div 6 = 12$ ). If you earn 10% interest, your money will double in 7.2 years ( $72 \div 10 = 7.2$ ). Some stock market investments in the late 1990s grew at 30%. That means that you would have doubled your investment in less than three years.

#### When you save, there are three important components to consider:

1. The amount you deposit (principal).
2. The interest rate you earn.
3. The length of time you save.



Year	Principal	Interest (6% of principal)	Principal plus interest (becomes next year's principal)
1	\$100.00	\$6.00	\$106.00
2	106.00	6.36	112.36
3	112.36	6.74	119.10
4	119.10	7.15	126.25

If you add to any of these, you'll earn a greater return. If you increase all three of them, you'll really increase your wealth.

**Principal x Interest Rate x Time = Total Amount**

If you have \$100 and put it into a Money Market account with a 6% interest rate for two years, the formula works like this:  $\$100 \times 6\% \times 2 \text{ years} = \$12.36$ .

Now, increase the principal, the interest rate, and the time. The total nearly triples:  $\$200 \times 10\% \times 5 \text{ years} = \$322.10$ .

The moral: Save as much as you can, as early as you can, at the best interest rate you can get. That way, you'll be on your way to greater financial security sooner.

# Activity for Middle School

Here's a game that demonstrates how money grows as a function of principal, interest rate, and time. Use a calculator to play the game with a friend. Materials: sharpened pencil, paper clip, and a calculator.

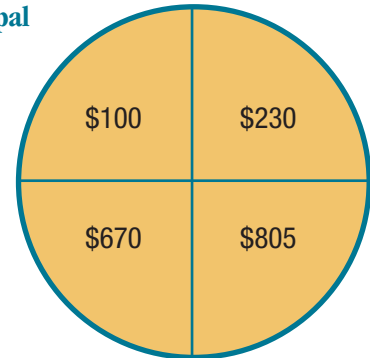
**Directions**

Place the paper clip in the center of the Principal circle and the point of the pencil through the paper clip pointing to the center of the paper to make a spinner. Flick the paper clip with your finger to make it spin. The space that you land on is your Principal amount. Repeat with the Interest Rate and Time circles.

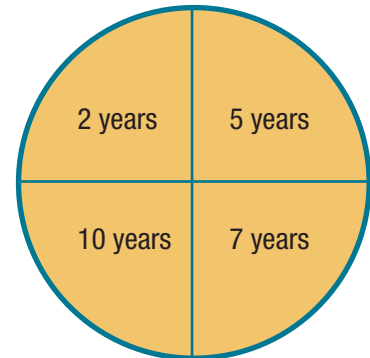
Multiply the three numbers to calculate your Total Amount. (Total Amount = Principal x Interest x Time). Then put your answer in the grid below. Play five rounds. The winner has the most money at the end of the game.

Round	Player #1	Round	Player #2
1	_____	1	_____
2	_____	2	_____
3	_____	3	_____
4	_____	4	_____
5	_____	5	_____
<b>Total</b>	_____	<b>Total</b>	_____

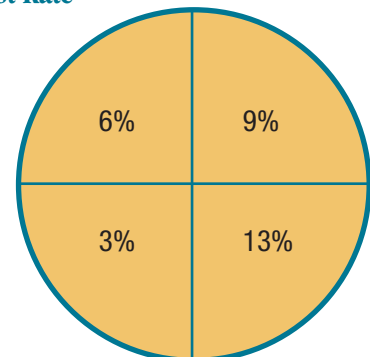
**Principal**



**Time**



**Interest Rate**



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