The rule of 72 is a simple guideline which will help you to determine how long it takes an investment to double its value. The formula, seen below, is easy to use and can be quickly modified to also give the interest rate needed to double the value of an investment over a specific period of time.

Rule of 72 formula to determine time in years to double: \[ t = \frac{72}{i} \]

where \( t \) = time in years \( i \) = interest rate as a %

Rule of 72 formula to determine interest rate to double: \[ i = \frac{72}{t} \]

**Example 1:** Miranda invests her money in a tax free savings account at 1.5% interest. How long will it take her money to double?

\[ t = \frac{72}{i} \]
\[ t = \frac{72}{1.5} \]
\[ t = 48 \text{ years} \]

It will take Miranda’s investment a total of 48 years to double in value, assuming that she doesn’t add any more money to the principle, that the interest rate stays the same, and that she does not remove any funds from her investment.

**Example 2:** Miranda decides she wants to invest her money where it will grow at a faster rate. She would like it to double in 12 years. What does the interest rate need to be?

\[ i = \frac{72}{t} \]
\[ i = \frac{72}{12} \]
\[ i = 6\% \]

In order for her money to double in 12 years, she needs to invest it at 6%.

**Activity 1:** Determine how long it will take an investment to double if the interest rate is …

a) 2%  
   b) 7%  
   c) 0.5%  
   d) 15%

**Activity 2:** Determine the interest rate required if the investment is to double in …

a) 5 years  
   b) 9 years  
   c) 36 years  
   d) 6 months

**Activity 3:** Show the final value of an investment over the given period of time.

a) $5000 @ 6\% \text{ for 36 years}  
   b) $20,000 @ 8\% \text{ for 36 years}$

**Inflation rate**

Doubling an investment sounds great, but there is the problem of decreased spending power over time. Each country’s currency experiences something called inflation. Money has less ability to buy something of the same value over time. For example, food costs more today than it did forty, twenty, or even ten years ago. Over time, the costs go up. Money is worth less. This is an important consideration when considering the value of something over time. If your savings are invested at 5%, but there is 3% inflation, your spending power really is only growing by 2%.

**Activity 3:** Determine the length of time it takes to double spending power if the annual rate of inflation is 2.5%. Subtract the inflation rate from the interest rate.

a) \( i = 6\% \)  
   b) \( i = 1\% \)  
   (a negative interest rate means it takes that much time to decrease its value by half)
Homework:
1. Determine the length of time it takes to double the investment of the following rates:
   a) 2%  
   b) 3%  
   c) 4%  
   d) 6% 
   e) 8% 
   f) 9%  
   g) 12% 
   h) 18% 
   i) 5%  How many months is that?  
   j) 3.5% How many months is that? 

2. A length of time is given. Convert to years if necessary. What must the interest rate be for an investment to double its value?
   a) 6 years  
   b) 9 years 
   c) 12 years 
   d) 48 months 
   e) 96 months 
   f) 288 months 
   g) 18 months 
   h) 3 months 

3. In order for savings to grow, it is best if you can leave a large principle in savings at a high interest rate for a long period of time. A starting investment is given along with an interest rate and a length of time. Determine the final value of the investment at the end of that time period using the rule of 72. If you are not sure, refer to activity 3 on the front of this sheet.
   a) $6000 at 6% for 24 years. 
   b) $3000 at 9% for 24 years 
   c) $10,000 at 3% for 24 years 
   d) $1000 at 18% for 24 years 

4. a) What was the length of time involved for all the questions in #3 above? ______  
   b) Which of the four questions produced the largest amount of money over that time? _____  
   c) Which of the four examples is probably the most unrealistic? _____  
   d) If there was an inflation rate of 2.5%, which of the four examples is probably the best? ___

5. **The inflation rate is 2.25%**. Determine how long it will take to double the actual value and the buying power of the following interest rates:

   Example: The interest rate is 5% 
   - at 5% the length of time to double the value is: 72 ÷ 5 = 14.4 years 
   - at 5% the length of time for it to double its buying power with an annual inflation rate of 2.25% is: 5% - 2.25% = 2.75% 72 ÷ 2.75% = 26.2 years 

   a) Interest rate at 7%  
   b) Interest rate at 3% 

Time to double money: 

Time to double buying power: