

The Magic of compounding

TEACHER'S NOTES



Lesson overview

Pupils will learn about the power of compounding by doubling a penny every day for 30 days to discover the answer to the question, "What's worth more – a penny doubled daily or £1,000,000 all at one time?"

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Instructions: Tell pupils that they have a choice. Would they prefer to be given £1,000,000 all at one time or to start with a penny and double their money every day? Give students approximately 15 minutes to do the calculations, or more time if they are doing them without a calculator.

Day	Calculation	Value
1		£0.01
2	0.01×2	£0.02
3	0.02×2	£0.04
4	0.04×2	£0.08
5	0.08×2	£0.16
6	0.16×2	£0.32
7	0.32×2	£0.64
8	0.64×2	£1.28
9	1.28×2	£2.56
10	2.56×2	£5.12
11	5.12×2	£10.24
12	10.24×2	£20.48
13	20.48×2	£40.96
14	40.96×2	£81.92
15	81.92×2	£163.84
16	163.84×2	£327.68
17	327.68×2	£655.36
18	655.36×2	£1,310.72

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19	$1,310.72 \times 2$	£2,621.44
20	$2,621.44 \times 2$	£5,242.88
21	$5,242.88 \times 2$	£10,485.76
22	$10,485.76 \times 2$	£20,971.52
23	$20,971.52 \times 2$	£41,943.04
24	$41,943.04 \times 2$	£83,886.08
25	$83,886.08 \times 2$	£167,772.16
26	$167,772.16 \times 2$	£335,544.32
27	$335,544.32 \times 2$	£671,088.64
28	$671,088.64 \times 2$	£1,342,177.28
29	$1,342,177.28 \times 2$	£2,684,354.56
30	$2,684,354.56 \times 2$	£5,368,709.12

To conclude the activity, have a discussion with pupils about *compounding*.

- Ask pupils, on what day did you become a millionaire? (*Day 28*)
- Ask for a show of hands to indicate who found these results surprising.
- Ask: Does anyone know why this penny grew so big? (*Accept all reasonable answers*)
- Introduce the term *compounding*.
 - Explain that when we save or invest money, our earnings can compound. That means that the earnings reinvest or grow bigger over time.
 - In a savings account, our money can earn compound interest. That means we earn interest on the original amount (the principal) and we earn interest on the interest, so it compounds or grows bigger and bigger over time. That's why it's great to save in a savings account rather than keeping all of your money in your current account.
 - Tell students that with compound interest, the money you have earned makes more money. But let students know that money doesn't double every day!
- To conclude, you can share with pupils that Nobel prize winning theoretical physicist Albert Einstein supposedly said, "*Compound interest is the eighth wonder of the world. He who understands it, earns it. He who doesn't, pays it.*"
 - Ask students what this means, (*Answers will vary. Students should understand that compound interest is magical because of the way your money grows. People who understand compound interest can earn it. But if you don't understand how compound interest works, you might wind up paying it by having a lot of debt that just keeps growing.*)