

## Compound Interest Lesson Outline

Grades: 7-12

Oregon State Standard: HS.PFE.B.3

### Objectives:

- Students will understand the relationship between time and compound interest.
- Students will know how to use compound interest calculators to find simple and compound interest.

### Procedure:

1. Begin class with the PowerPoint on the screen as students walk in. Point out Einstein's quote on the cover slide. Ask students what they think Einstein meant when he said, "**Compound interest** is the eighth wonder of the world. He who understands it earns it; he who doesn't pays it." - Albert Einstein. Allow for a brief class discussion.
2. Explain the penny problem. If offered \$750,000 or 1 penny that doubled daily for a month, what option would students choose? Having the students silently write down their choice is helpful because then students can't influence other students' decisions.
3. After students make their choice, play the video that reveals which was the better choice. <https://youtu.be/mdUUtBi3Uw0>
4. Discuss the choices the students made and emphasize that the lesson learned is in any financial decision, DO THE MATH because the math never lies. After the video click on slide 4 which shows the day-by-day progression of each choice. Either discuss as a whole class or pair share what this example has to do with compound interest. Slide 5 explains the connection to compound interest.
5. Compound Interest Calculator Slide: When you reach this slide decide which of the options to use below depending on the classroom resources available to you:
  - a. Students individually (or in pairs) work through each of the equations on a computer.
  - b. Use the corresponding handout (Compound Interest Scenarios) below to send the compound interest problems home with students as homework.
  - c. Work through each problem with your students on the projector rather than having them fill it in individually if technology resources are not available.
6. Slide 17 asks about the kind of interest you'd like to earn:
  - a. **As a Borrower:** As a borrower, you'd typically prefer **simple interest** because it results in lower overall payments. With simple interest, interest is calculated only on the initial amount you borrowed (the principal), so you avoid the extra costs that come with compound interest, where interest is added to the principal and accumulates over time. This makes simple interest easier to manage and more cost-effective in the long run.

- b. **As an Investor:** As an investor, you'd generally prefer **compound interest** because it allows your investment to grow exponentially over time. With compound interest, interest is calculated not only on your initial investment (the principal) but also on the accumulated interest. This "interest on interest" effect can significantly increase the total returns you earn, especially if the interest is compounded frequently (e.g., annually, quarterly, or monthly).
- c. In short:
  - Borrower:** Simple interest is preferable for lower costs.
  - Investor:** Compound interest is preferable for maximizing returns.
- 7. Slide 18 asks students to get creative with the knowledge they've gained by writing a letter to a fictitious niece or nephew about investing. This could be a quick in class assignment or a more formal writing assignment that students complete outside of class time.
- 8. **Optional:** additional work is available with the Compound Interest Scenarios worksheet and the Compound and Simple Interest Maze.

## Compound Interest Scenarios

Use the compound interest calculator found at <https://www.investor.gov/financial-tools-calculators/calculators/compound-interest-calculator> to complete the compound interest practice problems.

1. 2 parents decide they want to invest for college for their children.

**Investor Number 1:** Faye starts investing when her child is born. She puts \$10,000 in as an initial investment and never contributes again. She gifts the investment to her child on her 18<sup>th</sup> birthday.

**Investor Number 2:** Dierdre puts off opening the account until her child is 7. She initially puts in \$10,000 and also contributes \$50 a month until her child is 18. Both parents earn 8% interest.

- 1a. Will Dierdre's investment catch up to Faye's investment by the time their children are 18?

- 1b. How long would it take for Dierdre's investment to grow larger than Faye's with the additional \$50 a month?

- 1c. How much more will Dierdre have invested over the life of the investment when her investment surpasses Faye's?

2. 2 people invest \$5,000 into 2 different funds. The first investor makes 8% on his investment. The second investor makes 6% on his investment. After 30 years, if neither of them contributes any more to the fund, how much more money will the first investor have made?

3. Name 2 important factors when investing. Tell why each factor is important.