

LESSON PLAN

Compound Interest Mind Bend

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INCLUDED IN THIS PACKAGE

- **LESSON PLAN** (2 pages)
- **ACTIVITY** (7 pages)
- **QUIZ** (1 page)
- **ACTIVITY ANSWER KEY** (2 pages)
- **QUIZ ANSWER KEY** (1 page)

COLLECT FROM YOUR LIBRARY

- **VIDEO 06** (*Compound Interest Mind Bend*)
- **PRESENTATION 06** (*Compound Interest Mind Bend*)
- **HANDOUT 06** (*Compound Interest Mind Bend*)

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LESSON PLAN

Compound Interest Mind Bend

GRADES

10 to 12

TIME

45 minutes



OVERVIEW

In this lesson, students will explore the importance of compound interest as it applies to long-term savings. Students will examine factors that influence compound interest and learn how even small regular contributions can lead to substantial financial growth over time.

GOALS

- Understand the relationship between compound interest and its influencing factors
- Recognize the effects of compound interest in savings and in debt
- Develop long-term savings strategies

OBJECTIVES

- Define principal, interest, simple interest and compound interest
- Isolate the factors that influence compound interest (compounding period, interest rate, investment duration) and use those factors to generate practical savings strategies
- Recognize effects of compound interest in savings and in debt

ASSESSMENT

Use the activity in this lesson plan to assess students' grasp of the topic. An optional quiz is also provided (the quiz is not factored into the lesson's 45-minute runtime).

Did you know? This lesson plan explores concepts from Standard 4 (Investing) from the Council for Economic Education's National Standards for Personal Financial Education.

MATERIALS

- ☐ **VIDEO 06**—Compound Interest Mind Bend
- ☐ **PRESENTATION 06**—Compound Interest Mind Bend
- ☐ **ACTIVITY**—Compound Interest Graph Analysis and Answer Key
- ☐ **HANDOUT 06**—Compound Interest Mind Bend
- ☐ **QUIZ**—Compound Interest Mind Bend and Answer Key

PREPARATION

- Gather digital materials (video and presentation)
- Print **HANDOUT 06** for each student
- Prepare the **ACTIVITY**: Print at least one copy of each graph (pages 1–6). Print a copy of the worksheet (page 7) for each student. (Optional: have a copy of each graph ready to display.)
- (Optional) Print **QUIZ** (Compound Interest Mind Bend) for each student



LESSON PLAN

Compound Interest Mind Bend

TIMELINE

- 5 minutes** Introduce topic and distribute **HANDOUT 06**
- 5 minutes** Go over the first section (slides 1–9) of **PRESENTATION 06**
- 30 minutes** Facilitate **ACTIVITY**
- 5 minutes** Show **VIDEO 06** (*Compound Interest Mind Bend*)
- (Optional)** Assessment: **QUIZ** (*Compound Interest Mind Bend*)

INSTRUCTIONS

1. Ask your class the following questions:
 - What do you think your largest purchase will be in your lifetime?
 - How do you think people are able to save up enough money for those purchases?

Explain that long-term savings goals are essential in order to afford large purchases such as higher education, vehicles, homes and retirement savings; compound interest is what accelerates the value of those long-term savings
2. Distribute **HANDOUT 06**
3. Review slides 1–9 of **PRESENTATION 06** to briefly explain the concepts of principal and interest, and to clarify the basic difference between simple and compound interest
 - Mention that students may already be familiar with compound interest as a formula in math class, but today's focus will be on saving and investing
4. Facilitate the **ACTIVITY**:
 - Provide each student with a worksheet (page 7 of the **ACTIVITY**)
 - Divide students into six groups and give each group a different graph to analyze

- Allow groups 5–10 minutes to interpret their graph
- Have each group present their findings to the class (Optional: display pages 1–6 of the **ACTIVITY** as groups present so that the entire class can follow along)
- Use the answer key to ensure each group shares relevant information
- Students may use the bottom half of their worksheet to take notes

5. Show **VIDEO 06**
 - Tell students to be on the lookout for factors they analyzed within the video
6. Wrap up by sharing the following:
 - Compound interest makes long-term saving effective
 - Starting early and contributing often are good strategies for taking advantage of compound interest
 - Compound interest isn't always a good thing—the same principles work against you in debt
7. (Optional) Distribute **QUIZ** for individual assessment, or answer the questions together as a class; decide whether or not students can reference their notes/handouts during the quiz

NOTES



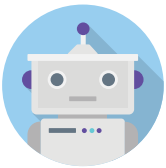
ACTIVITY

Compound Interest Mind Bend

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GRAPH 1: SIMPLE INTEREST VS. COMPOUND INTEREST



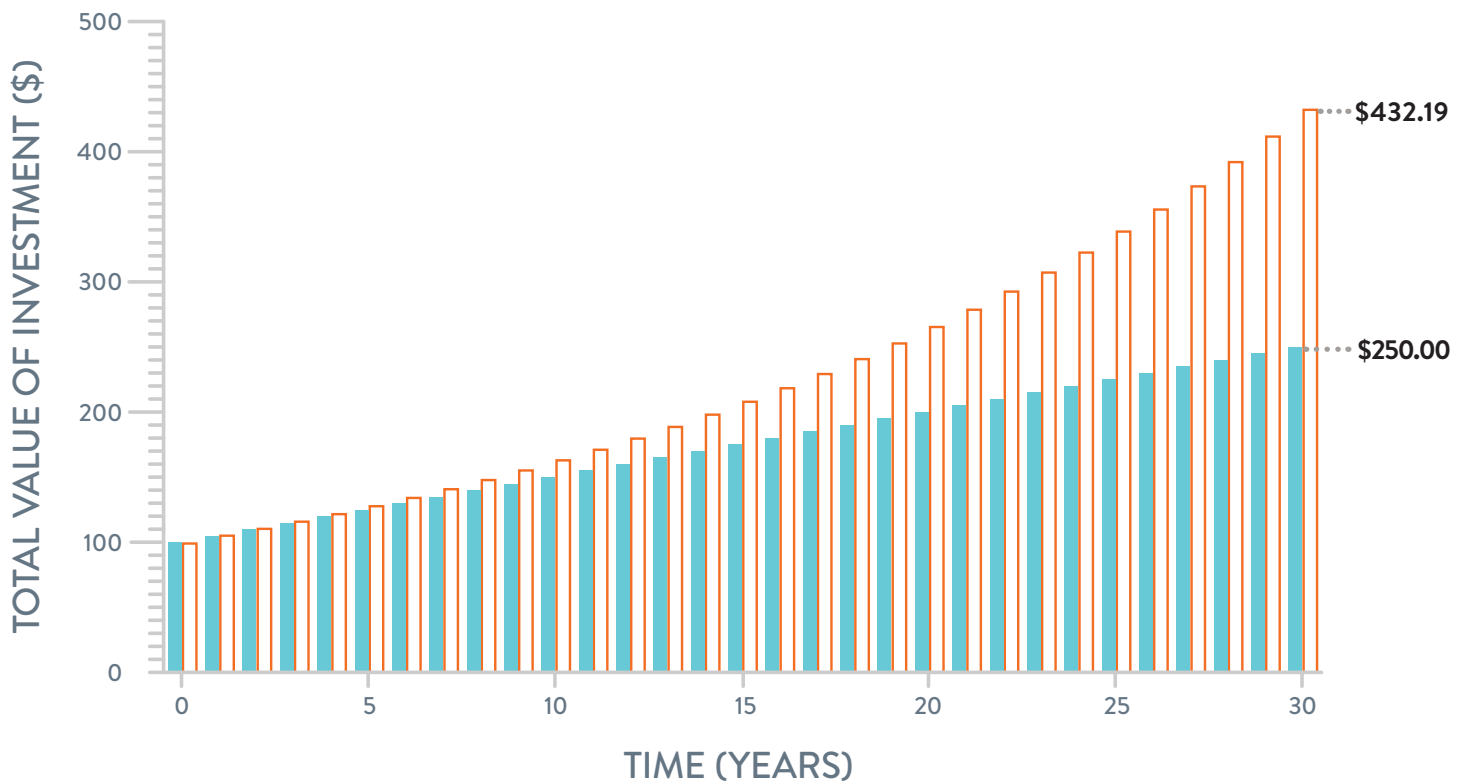
BLIPPY

Initial deposit: **\$100**
Additional annual contribution: **\$0**
Interest rate: **5% simple interest**
(compounding period not applicable)
Years to grow: **30**



EINSTEIN

Initial deposit: **\$100**
Additional annual contribution: **\$0**
Interest rate: **5% compound interest**
Interest compounds **annually**
Years to grow: **30**



GUIDING QUESTIONS

- What's the difference between Blippy's investment and Einstein's investment?
- Whose investment earned more interest after 30 years?
- How does the **shape** of Einstein's graph differ from Blippy's graph? Why do you think that is?



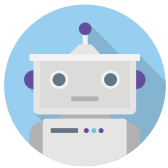
ACTIVITY

Compound Interest Mind Bend

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GRAPH 2: COMPOUNDING PERIOD



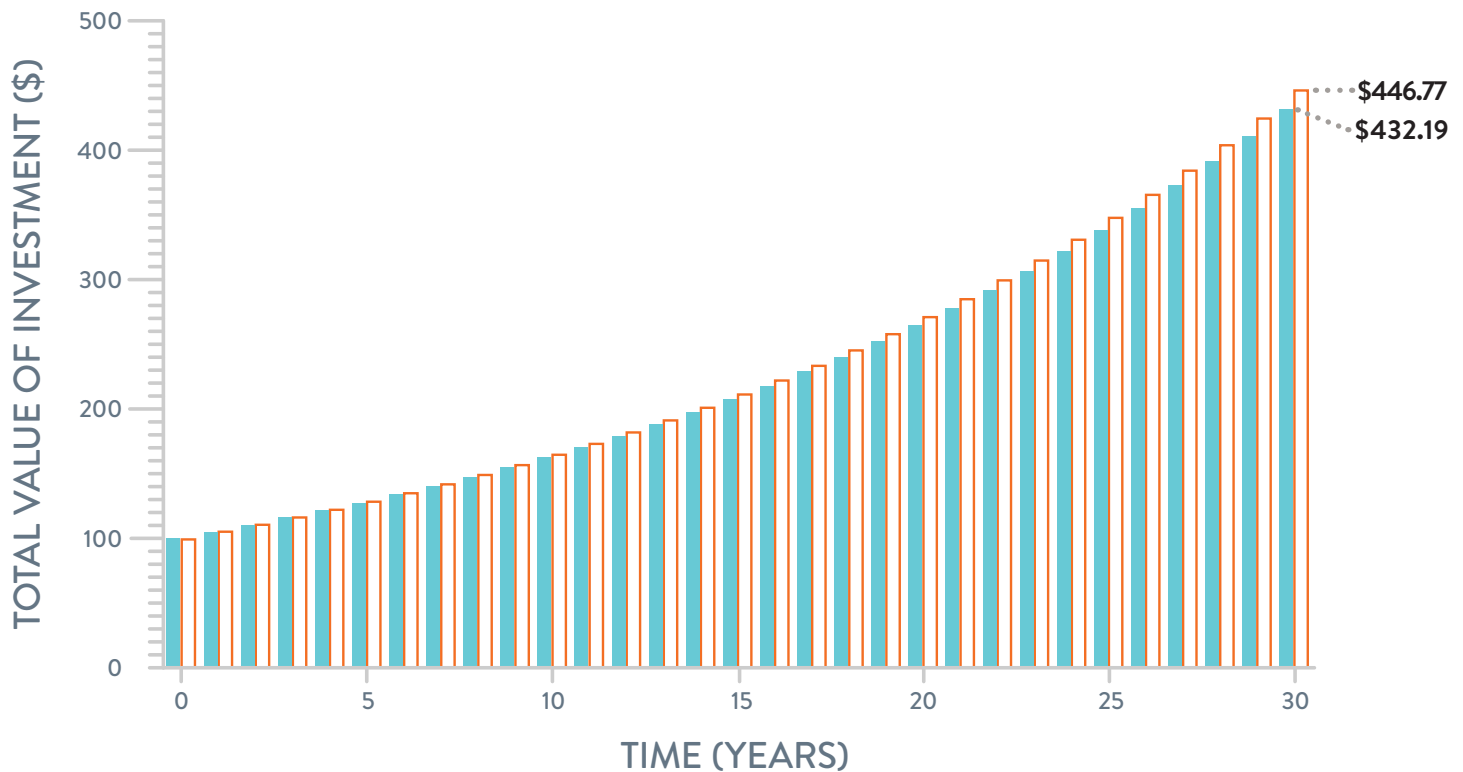
BLIPPY

Initial deposit: **\$100**
Additional annual contribution: **\$0**
Interest rate: **5%**
Interest compounds **annually**
Years to grow: **30**



EINSTEIN

Initial deposit: **\$100**
Additional annual contribution: **\$0**
Interest rate: **5%**
Interest compounds **monthly**
Years to grow: **30**



GUIDING QUESTIONS

- What's the difference between Blippy's investment and Einstein's investment?
- Whose investment earned more interest?
- What do you think would happen if Blippy's investment compounded weekly instead of annually?



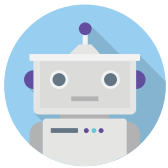
ACTIVITY

Compound Interest Mind Bend

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GRAPH 3: WITHDRAWING THE INTEREST



BLIPPY

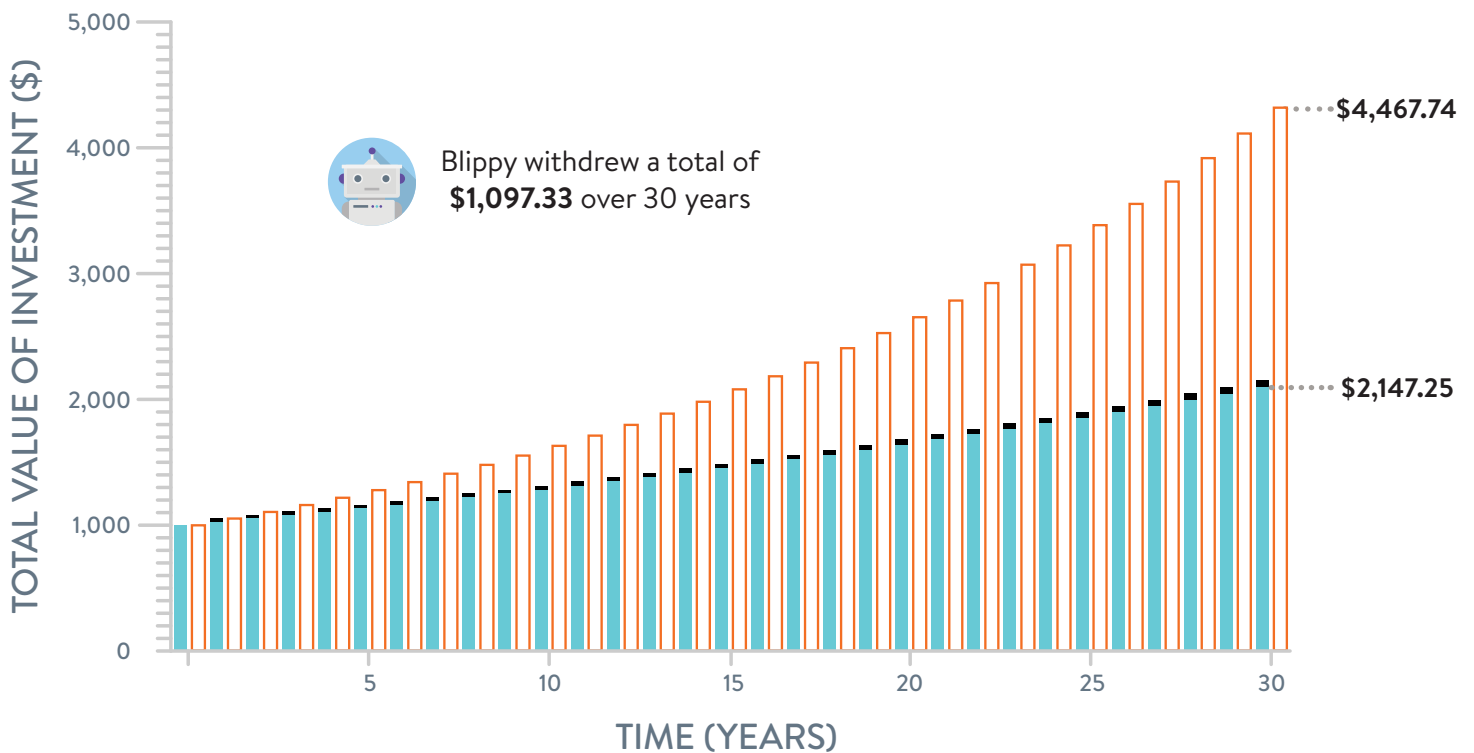
Initial deposit: **\$1,000**
Additional annual contribution: **\$0**
Interest rate: **5%**
Interest compounds **annually**
Years to grow: **30**
Blippy withdraws half of his interest each year



EINSTEIN

Initial deposit: **\$1,000**
Additional annual contribution: **\$0**
Interest rate: **5%**
Interest compounds **annually**
Years to grow: **30**
Einstein leaves his investment alone

■ Represents how much Blippy withdraws each year



GUIDING QUESTIONS

- What did Blippy do differently than Einstein?
- If you add the amount of money Blippy withdrew to the total value of his investment after 30 years, is it equal to the total value of Einstein's investment? Why or why not?



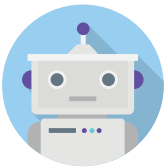
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GRAPH 4: INTEREST RATE



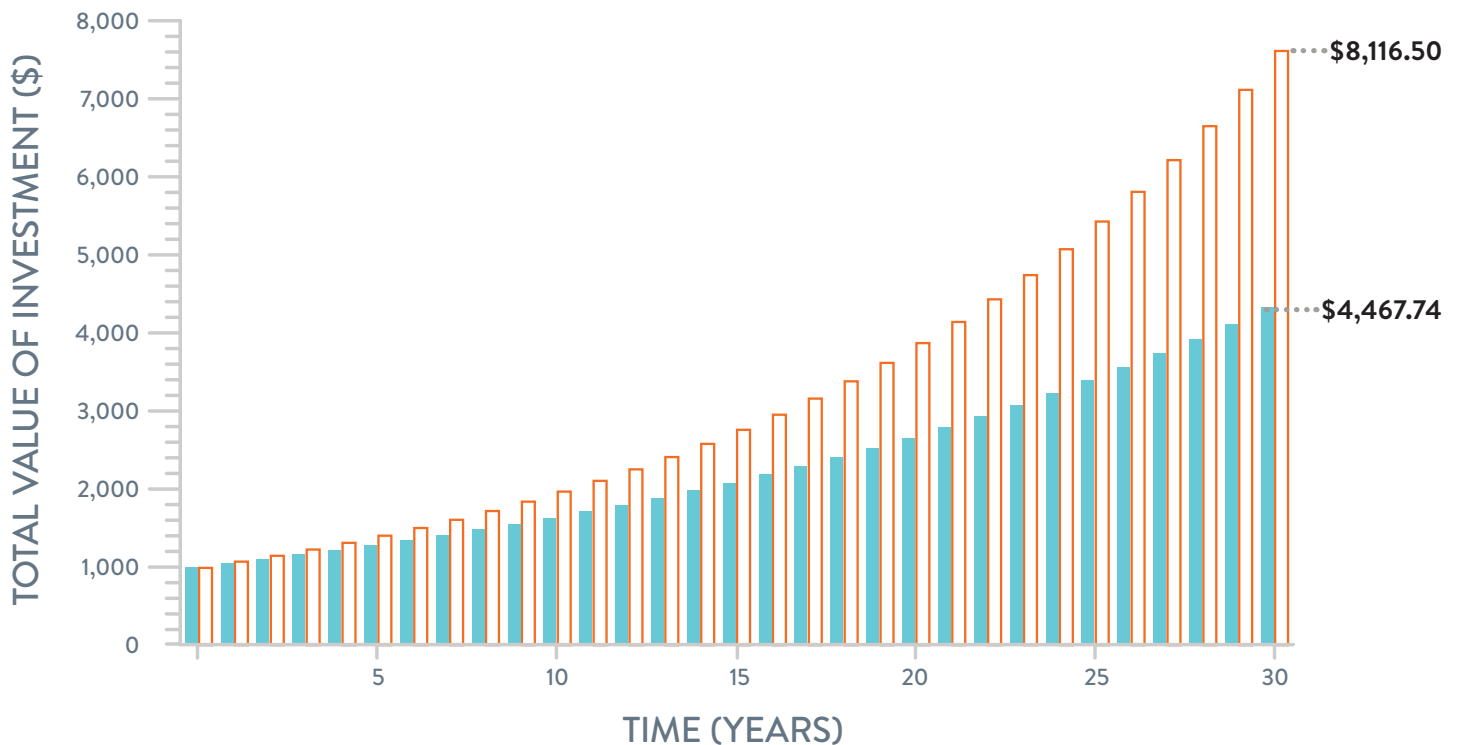
BLIPPY

Initial deposit: **\$1,000**
Additional annual contribution: **\$0**
Interest rate: **5%**
Interest compounds **annually**
Years to grow: **30**



EINSTEIN

Initial deposit: **\$1,000**
Additional annual contribution: **\$0**
Interest rate: **7%**
Interest compounds **annually**
Years to grow: **30**



GUIDING QUESTIONS

- What's the difference between Blippy's investment and Einstein's investment?
- Whose investment earned more interest after 30 years?
- What effect does the interest rate have on compound interest?



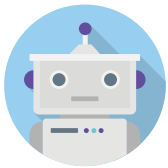
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GRAPH 5: STARTING EARLY



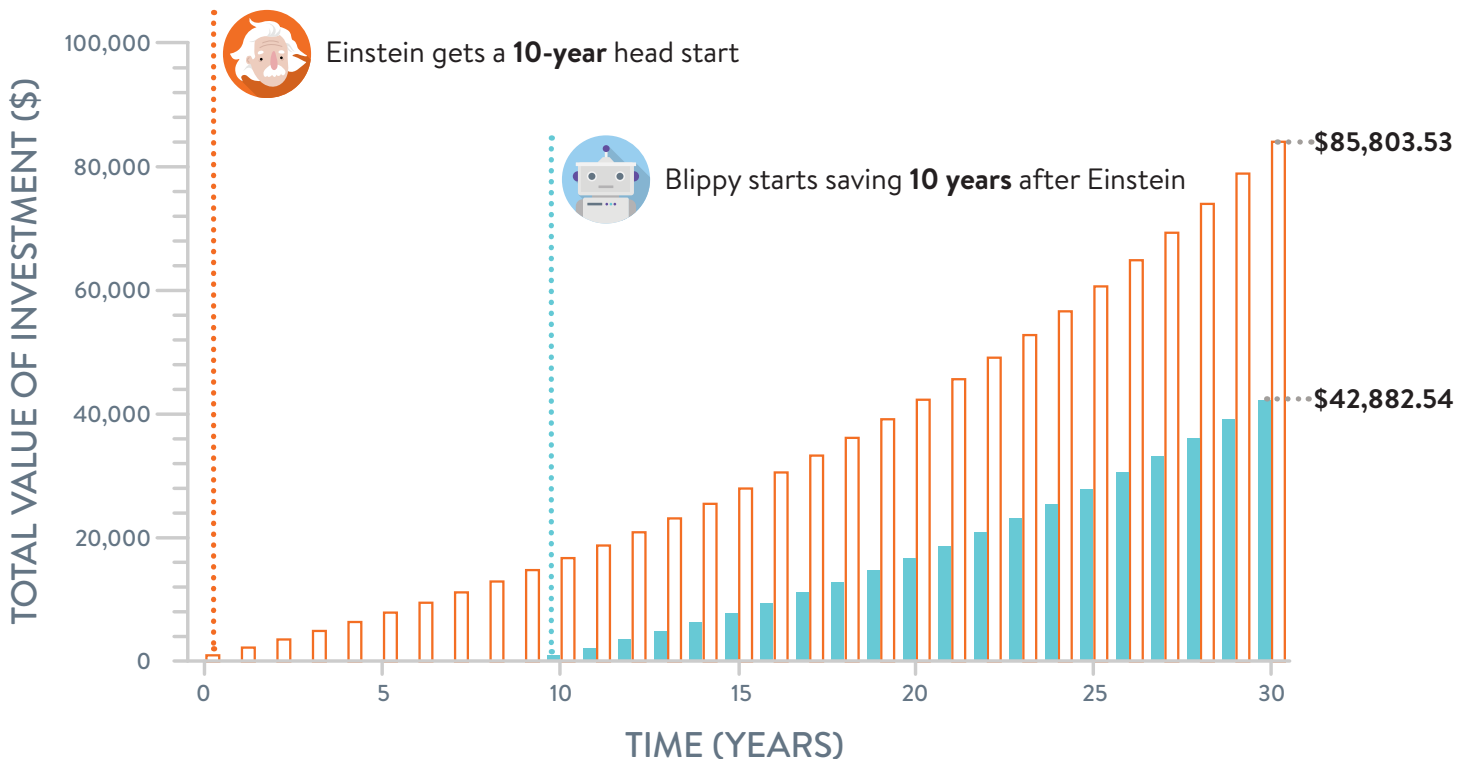
BLIPPY

Initial deposit: **\$1,000**
Additional annual contribution: **\$1,200**
Contributes **\$25,000 total**
Interest rate: **5%**
Interest compounds **annually**
Years to grow: **20**



EINSTEIN

Initial deposit: **\$1,000**
Additional annual contribution: **\$1,200**
Contributes **\$37,000 total**
Interest rate: **5%**
Interest compounds **annually**
Years to grow: **30**



Blippy earned a total of \$17,882 in interest and Einstein earned a total of \$48,803 in interest

GUIDING QUESTIONS

- What did Einstein do differently than Blippy?
- Whose investment earned more interest at the 30-year mark?
- Who contributed the most money toward their investment?



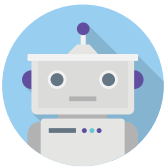
ACTIVITY

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GRAPH 6: STARTING EARLY BUT CONTRIBUTING LESS



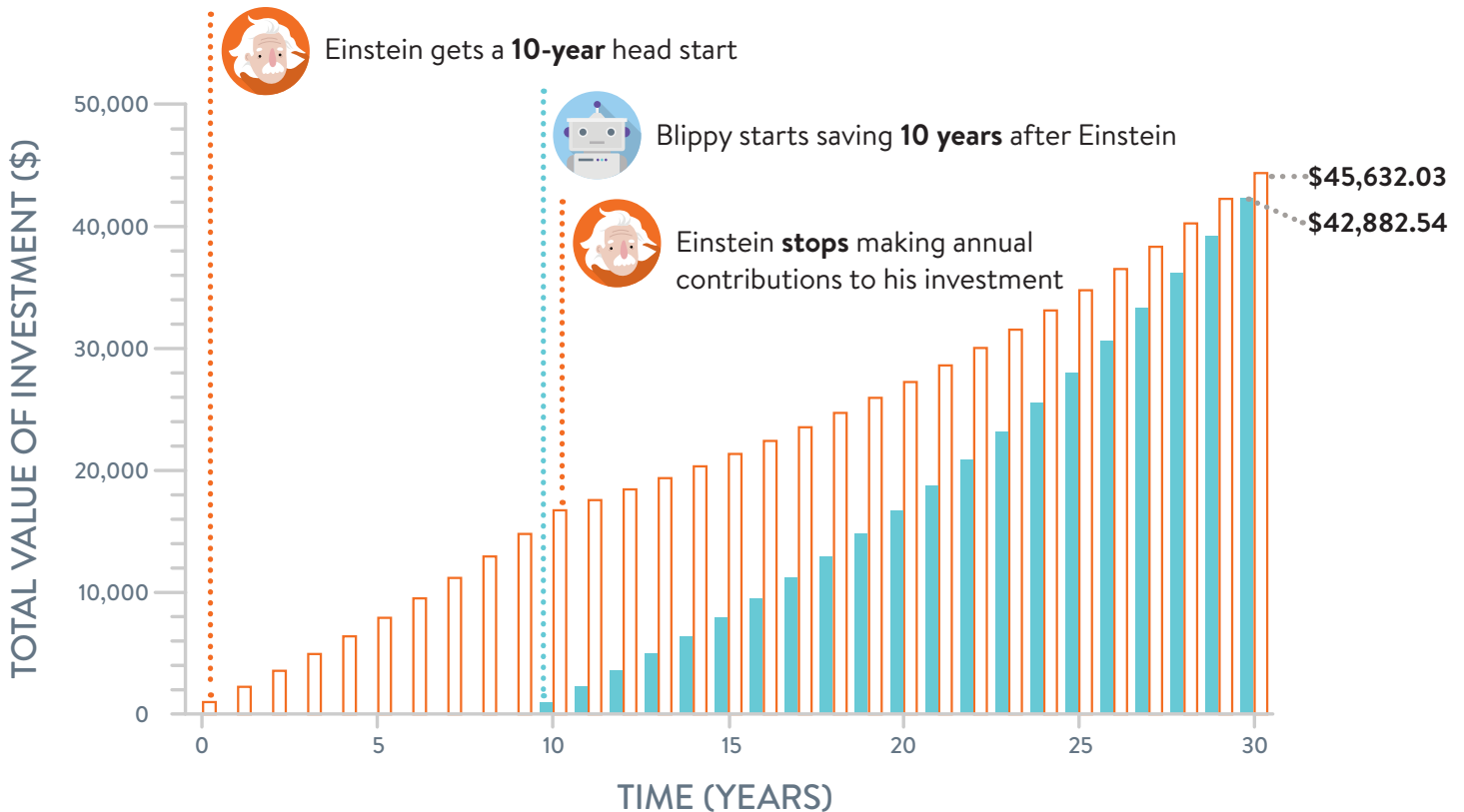
BLIPPY

Initial deposit: **\$1,000**
Additional annual contribution: **\$1,200**
Contributes for **20 years**
Contributes **\$25,000 total**
Interest rate: **5%**
Interest compounds **annually**
Years to grow: **20**



EINSTEIN

Initial deposit: **\$1,000**
Additional annual contribution: **\$1,200**
Contributes for **the first 10 years only**
Contributes **\$13,000 total**
Interest rate: **5%**
Interest compounds **annually**
Years to grow: **30**



GUIDING QUESTIONS

- What did Einstein do differently than Blippy?
- Whose investment was worth more at the 30-year mark? Who paid more money into their investment?
- Why is it important to start saving as early as possible?



ACTIVITY

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WORKSHEET – GRAPH ANALYSIS

Directions: Interpret the provided graph in order to answer the questions below.
Be prepared to present your findings to the class.

GRAPH #:

FACTOR:

What conclusion did you reach?

Is this factor under your control?

What can you do to influence this factor in a positive way (i.e., to increase interest earnings)?

What can you do to influence this factor in a negative way (i.e., to decrease interest earnings)?

NOTES



QUIZ

Compound Interest Mind Bend

NAME: _____

TOTAL
/8 pts

MULTIPLE CHOICE

Directions: CIRCLE the best possible answer for each question.

/4 pts

1. Compound interest is:
 - a. The amount of money upon which interest is paid
 - b. Earned on the principal amount only
 - c. Earned on the principal amount plus the interest already earned
 - d. The Rule of 72
2. Which of the following actions will **limit** your long-term savings?
 - a. Getting a head start
 - b. Making regular contributions to your investment
 - c. Spending only 10% of the interest earned each year
 - d. All of the above
3. Which of the following factors is the **least under your control** when it comes to compound interest?
 - a. The interest rate
 - b. The principal
 - c. The annual contribution amount
 - d. The duration of the investment
4. What does it mean when an investment is compounded annually?
 - a. Interest is added to the principal once a year
 - b. Interest is added only during the first year of investment
 - c. Interest is compounded based on the investor's age
 - d. Interest is calculated monthly

TRUE OR FALSE

Directions: CIRCLE either true or false.

/4 pts

5. TRUE or FALSE All other factors being equal, an investment that compounds monthly will earn more interest than an investment that compounds annually.
6. TRUE or FALSE All other factors being equal, an investment with simple interest will perform better than an investment with compound interest.
7. TRUE or FALSE Compound interest can work against you.
8. TRUE or FALSE Simple interest is calculated only on the initial principal.

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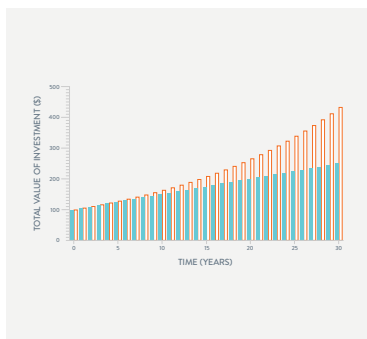


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ACTIVITY ANSWER KEY

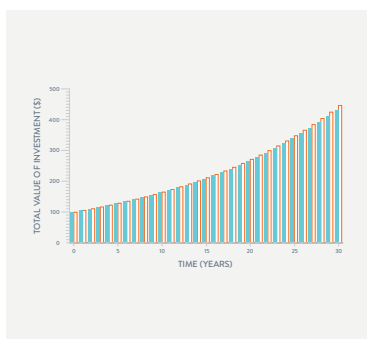
Compound Interest Mind Bend

INTERPRETING GRAPHS



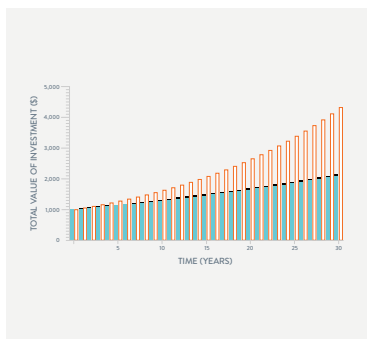
Graph 1: Simple Interest vs. Compound Interest

- The main factor is compound interest (Einstein has it, Blippy does not)
- Einstein earns interest on his interest; Blippy does not
- Einstein's graph is **exponential**; Blippy's graph is **linear**
- Blippy earns the same amount of interest each year; Einstein earns an increasing amount of interest each year
- Whether an investment compounds or not is set by the financial institution
- To increase interest earnings, look for investments with compound interest



Graph 2: Compounding Period

- The main factor is the compounding period (Einstein's interest compounds once a month and Blippy's interest compounds once a year)
- Einstein's investment earns more interest than Blippy's
- Investments that compound more frequently (shorter compounding period) earn more money
- The compounding period of an investment is set by the financial institution
- To increase interest earnings, look for investments with monthly or even weekly compounding



Graph 3: Spending the Interest

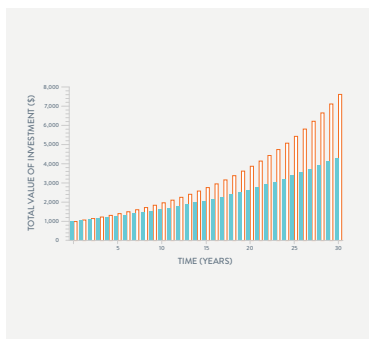
- The main factor is withdrawing the interest vs. saving it
- Einstein's investment was worth \$1,077.36 more than Blippy's, even when you include the money Blippy withdrew
- Whether you withdrew your interest or not is under your control
- To increase interest earnings, allow your savings to grow uninterrupted
- Withdrawals from your long-term savings investments severely limit the effects of compound interest

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ACTIVITY ANSWER KEY

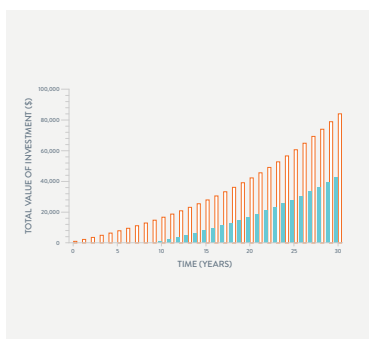
Compound Interest Mind Bend

INTERPRETING GRAPHS



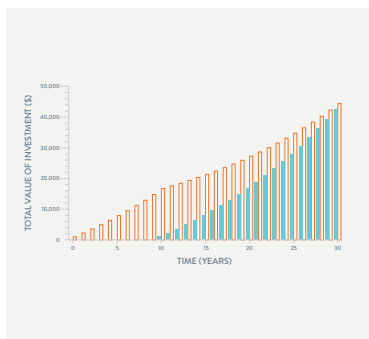
Graph 4: Interest Rate

- The main factor is the interest rate (Einstein's interest rate of 7% is higher than Blippy's interest rate of 5%)
- Both Blippy and Einstein earn an increasing amount of interest each year, but Einstein earns more than Blippy
- The interest rate of an investment is set by the financial institution
- To increase interest earnings, look for investments with high interest rates



Graph 5: Starting Early

- The main factor is starting to save early
- Einstein earned more than double the amount of interest that Blippy did, simply by starting to save early
- Einstein did contribute more to his investment than Blippy did, since he was saving for a longer period of time
- Starting early is under your control
- To increase interest earnings, start saving as soon as possible
- Delaying your savings will limit the amount of interest you can earn



Graph 6: Starting Early but Contributing Less

- The main factor is starting to save early (even if you're contributing less)
- Einstein made more money even though he contributed only half the amount that Blippy did
- Both starting early and contributing often are under your control
- To increase interest earnings, start saving as soon as possible and contribute regularly to your savings
- Putting your savings off and choosing not to make regular contributions will limit the amount of interest you can earn



QUIZ ANSWER KEY

Compound Interest Mind Bend

MULTIPLE CHOICE

Directions: CIRCLE the best possible answer for each question.

/4 pts

1. Compound interest is:
 - a. The amount of money upon which interest is paid
 - b. Earned on the principal amount only
 - ☒ c. Earned on the principal amount plus the interest already earned
 - d. The Rule of 72
2. Which of the following actions will **limit** your long-term savings?
 - a. Getting a head start
 - b. Making regular contributions to your investment
 - ☒ c. Spending only 10% of the interest earned each year
 - d. All of the above
3. Which of the following factors is the **least under your control** when it comes to compound interest?
 - ☒ a. The interest rate
 - b. The principal
 - c. The annual contribution amount
 - d. The duration of the investment
4. What does it mean when an investment is compounded annually?
 - ☒ a. Interest is added to the principal once a year
 - b. Interest is added only during the first year of investment
 - c. Interest is compounded based on the investor's age
 - d. Interest is calculated monthly

TRUE OR FALSE

Directions: CIRCLE either true or false.

/4 pts

5. ☒ TRUE or FALSE All other factors being equal, an investment that compounds monthly will earn more interest than an investment that compounds annually.
6. TRUE or ☒ FALSE All other factors being equal, an investment with simple interest will perform better than an investment with compound interest.
7. ☒ TRUE or FALSE Compound interest can work against you.
8. ☒ TRUE or FALSE Simple interest is calculated only on the initial principal.