LESSON PLAN

Compound Interest

- IT'S A -
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INCLUDED IN THIS PACKAGE

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

COLLECT FROM YOUR LIBRARY

- **VIDEO 06** *(Compound Interest Mind Bend)*
- **VIDEO 22** *(The Rule of 72)*
- **HANDOUT 06** *(Compound Interest Mind Bend)*
- **HANDOUT 22** *(The Rule of 72)*

LESSON PLAN

Compound Interest

GRADES
8 to 10

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 use them to formulate their own savings strategies. They will also learn how to use the Rule of 72 to quickly estimate how long it takes for an investment to double in value.

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
- Estimate investment earnings with the Rule of 72

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
- Estimate how long takes for an investment to double using the Rule of 72

ASSESSMENT

An optional quiz has been provided with this lesson plan (the quiz is not factored into the lesson's 45-minute runtime).

Did you know? *This lesson plan explores concepts from Standard 3 (Saving) from the* ***Council for Economic Education's National Standards for Financial Literacy.***

MATERIALS

- ☐ **VIDEO 06**—*Compound Interest Mind Bend*
- ☐ **VIDEO 22**—The *Rule of 72*
- ☐ **ACTIVITY A**—*Compound Interest*
- ☐ **ACTIVITY B**—*Compound Interest and Answer Key*
- ☐ **HANDOUT 06**—*Compound Interest Mind Bend*
- ☐ **HANDOUT 22**—*The Rule of 72*
- ☐ **QUIZ**—*Compound Interest and Answer Key*

PREPARATION

- *Gather digital materials (videos)*
- *Print* **HANDOUT 06** *and* **HANDOUT 22** *for each student*
- *Prepare* **ACTIVITY A** *by having it ready to display*
- *Prepare* **ACTIVITY B***: 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) for each student*

LESSON PLAN

Compound Interest

TIME LINE

5 minutes	Topic intro
5 minutes	**ACTIVITY A** notes
20 minutes	Facilitate **ACTIVITY B**
5 minutes	Show **VIDEO 06** *(Compound Interest Mind Bend)*
5 minutes	Topic intro and show **VIDEO 22** *(The Rule of 72)*
5 minutes	Wrap up and distribute **HANDOUT 06** and **HANDOUT 22**
(Optional)	Assessment: **QUIZ** *(Compound Interest)*

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. Display **ACTIVITY A** and briefly review the definitions. Students may take notes.
   - 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
3. Facilitate **ACTIVITY B**:
   - Provide each student with a worksheet (page 7 of **ACTIVITY B**)
   - 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 **ACTIVITY B** 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
4. Show **VIDEO 06**
   - Tell students to be on the lookout for factors they analyzed within the video
5. Intro and show **VIDEO 22**
   - Explain that the Rule of 72 is used to calculate how long it takes your investment to double
   - The Rule of 72 works only with investments with compound interest
6. Wrap up by sharing the following:
   - Compound interest makes long-term savings effective
   - Starting early and contributing often are good strategies for taking advantage of compound interest
   - The Rule of 72 is used to estimate how long it will take for a compounding investment to double
   - Compound interest isn't always a good thing—the same principles work against you in debt
7. (Optional) Distribute **QUIZ** for individual assessment

NOTES

ACTIVITY A

Compound Interest

NOTES

Directions: Write down the following definitions.

Principal:
The amount of money upon which interest is paid.

Interest Rate:
In savings, an interest rate is the price a financial institution pays for using a saver's money and is normally expressed as an annual percentage of the amount saved.

Simple Interest:
Simple interest is earned on the principal amount only.

Compound Interest:
Compound interest is earned on the principal amount plus the interest already earned.

Source: Council for Economic Education

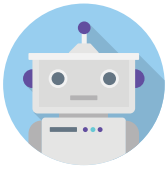
EXAMPLE

	Simple Interest		Compound Interest	
Initial deposit	**$100**	+$5.00	**$100.00**	+$5.00
after 1 year	**$105**	+$5.00	**$105.00**	+$5.25
after 2 years	**$110**	+$5.00	**$110.25**	+$5.51
after 3 years	**$115**	+$5.00	**$115.76**	+$5.79
after 4 years	**$120**	+$5.00	**$121.55**	+$6.08
after 5 years	**$125**		**$127.63**	
	same amount of interest every year		*increasing amount of interest every year*	

ACTIVITY B

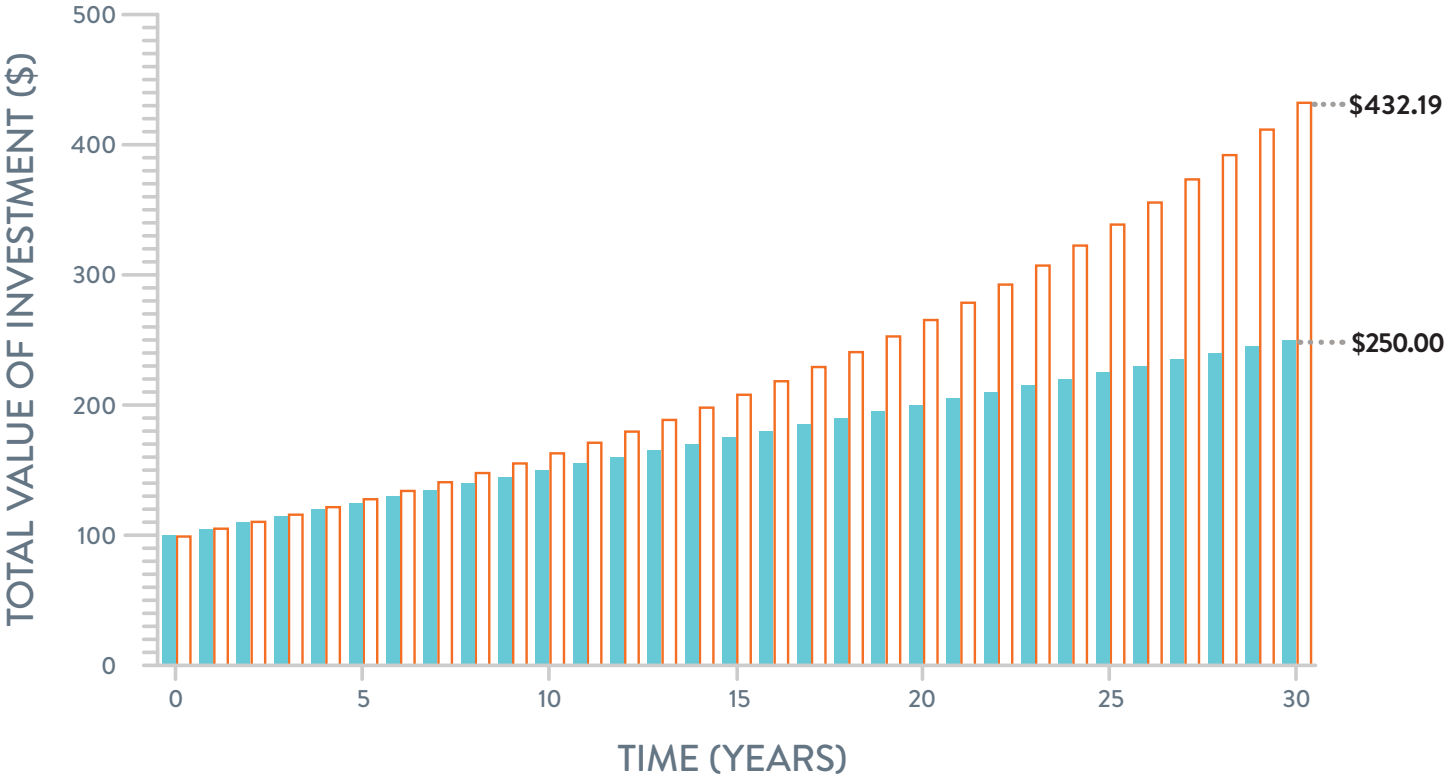
Compound Interest

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**



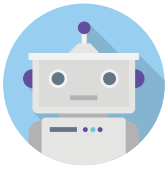
GUIDING QUESTIONS

- 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 B

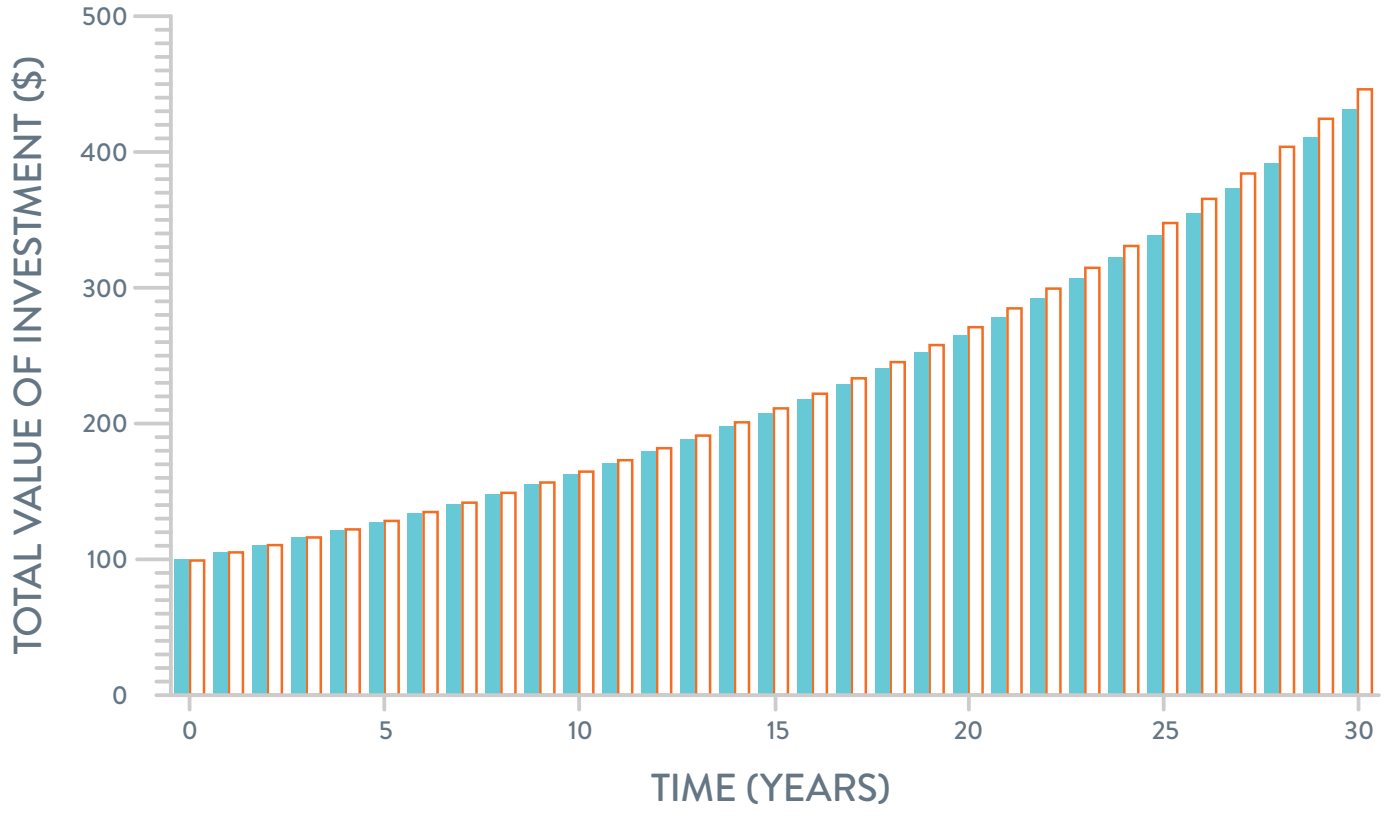
Compound Interest

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**



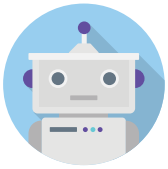
GUIDING QUESTIONS

- 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 B

Compound Interest

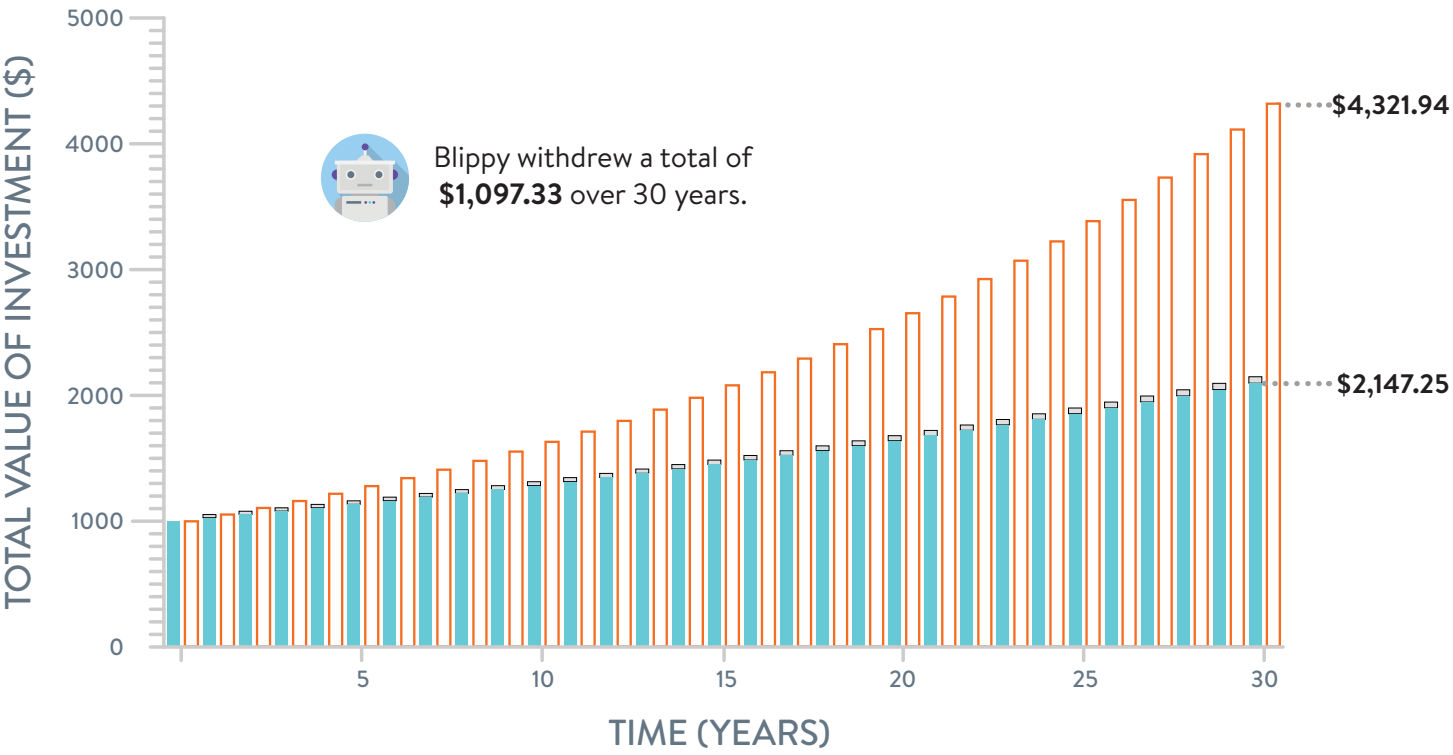
GRAPH 3: SPENDING THE INTEREST



BLIPPY
Initial deposit: **$1,000**
Additional annual contribution: **$0**
Interest rate: **5%**
Interest compounds **annually**
Years to grow: **30**
Blippy spends 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 spends each year



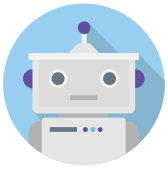
GUIDING QUESTIONS

- What did Blippy do differently than Einstein?
- If you add the amount of money Blippy spent 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?

ACTIVITY B

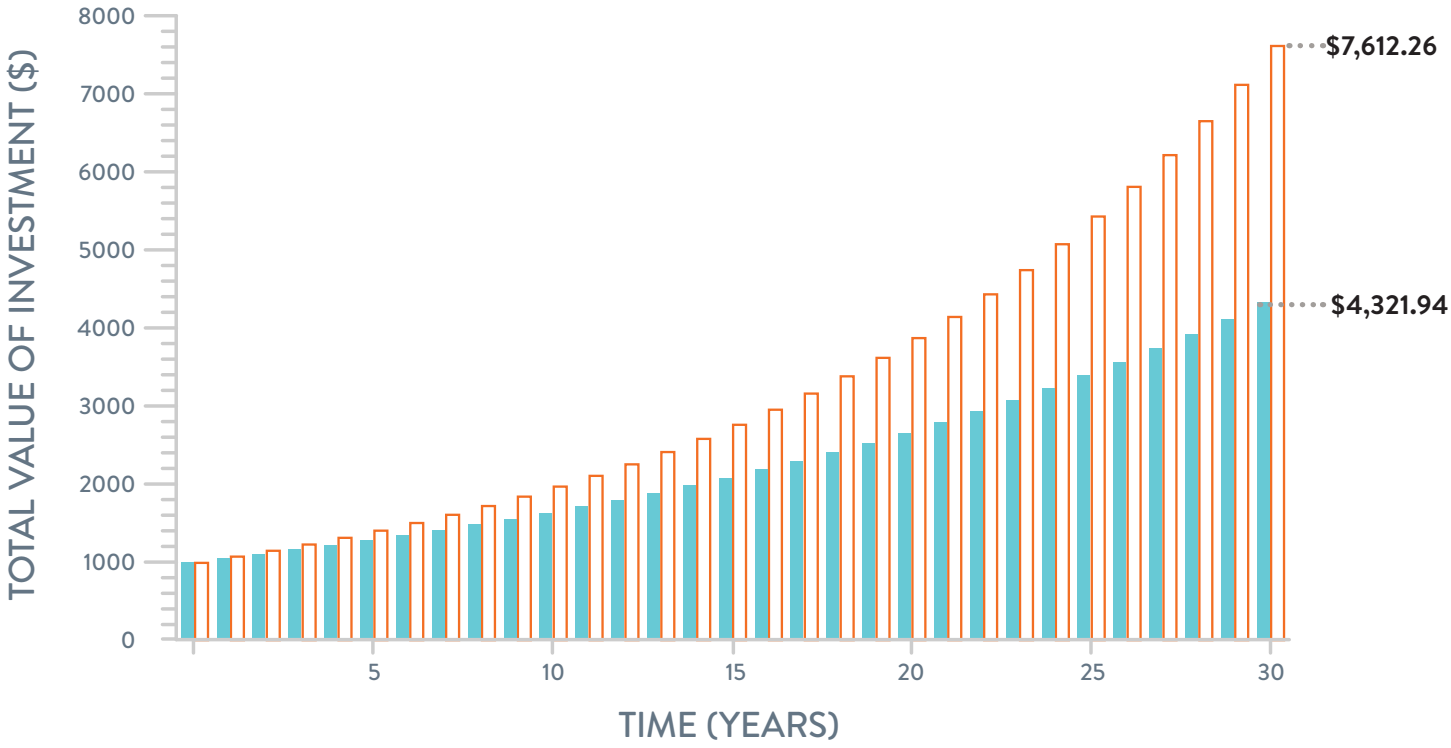
Compound Interest

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?

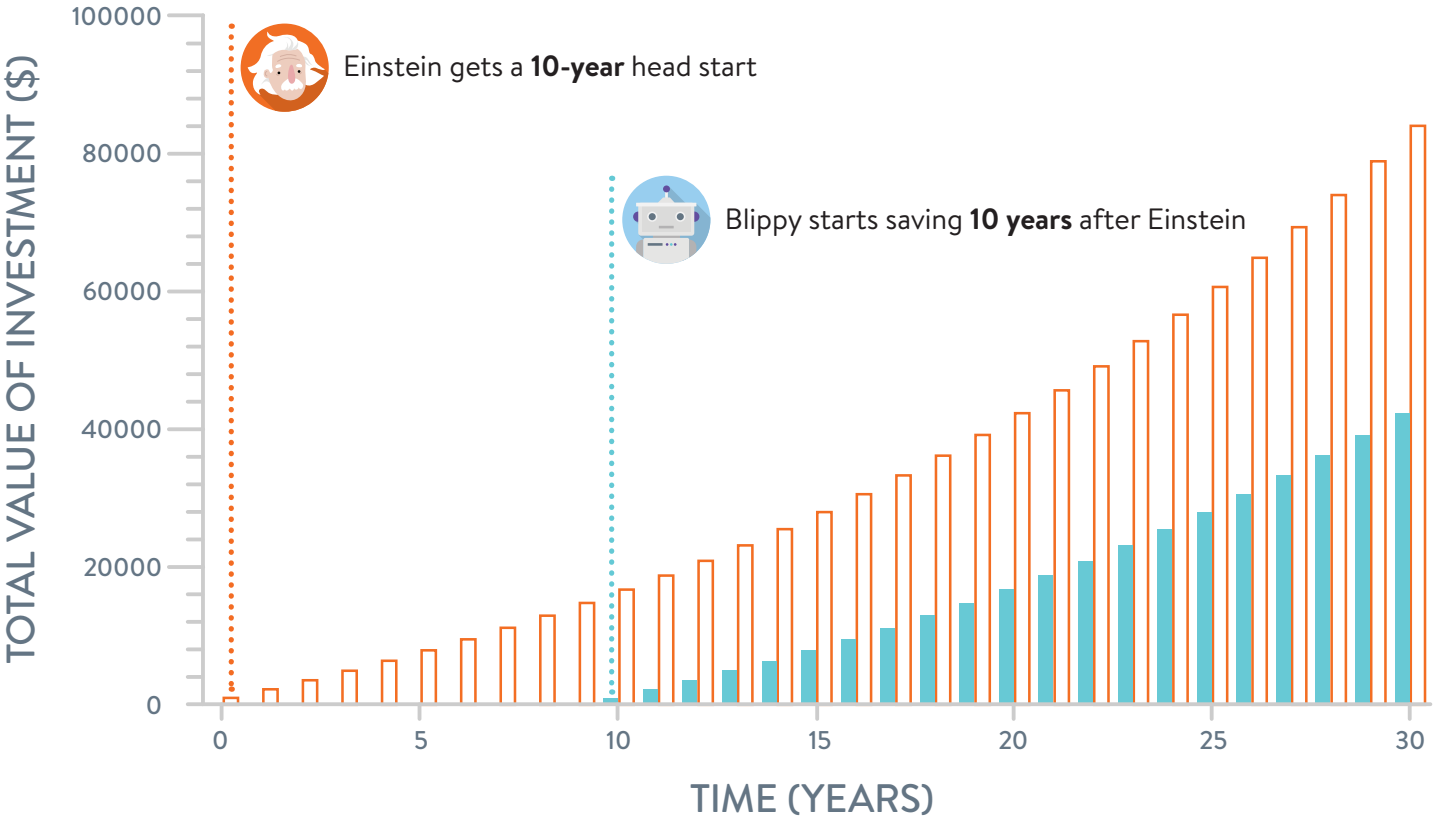
ACTIVITY B

Compound Interest

GRAPH 5: STARTING EARLY

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

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



Blippy earned a total of $17,332 in interest and Einstein earned a total of $47,048 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?

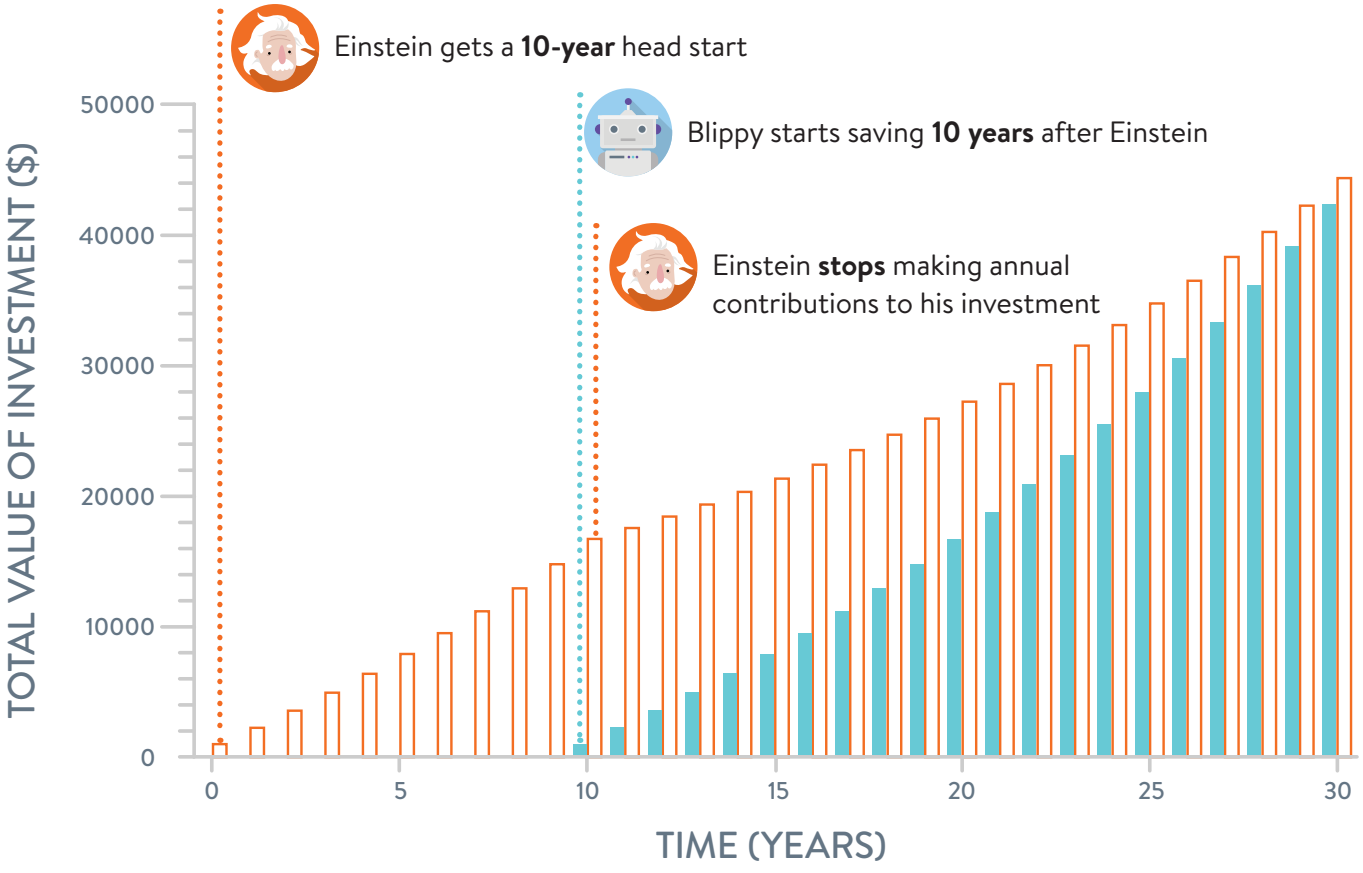
ACTIVITY B

Compound Interest

GRAPH 6: STARTING EARLY AND CONTRIBUTING LESS

BLIPPY
Initial deposit: **$1,000**
Additional annual contribution: **$1,200**
Contributes for **20 years**
Contributes **$24,000 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 **$12,000 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 B

Compound Interest

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 (increase interest earnings)?

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

NOTES

QUIZ

Compound Interest

NAME: _____

TOTAL
/8 pts

MULTIPLE CHOICE

Directions: CIRCLE the best possible answer for each question.

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. The Rule of 72 is used to estimate:
    a. How much your investment will be worth when you retire
    b. How long it will take for your investment to double in value
    c. How long it will take for your investment to earn $72 of interest
    d. How much money you should put into an investment

/4 pts

TRUE OR FALSE

Directions: CIRCLE either true or false.

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 — The Rule of 72 only works for investments with compound interest.

/4 pts

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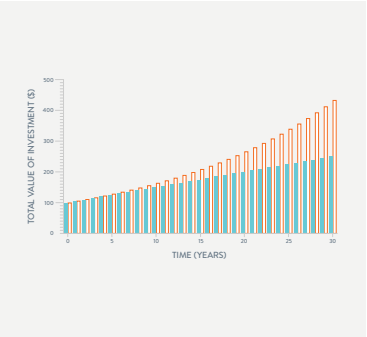
ACTIVITY B ANSWER KEY

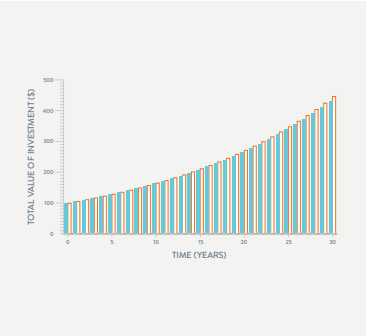
Compound Interest

INTERPRETING GRAPHS



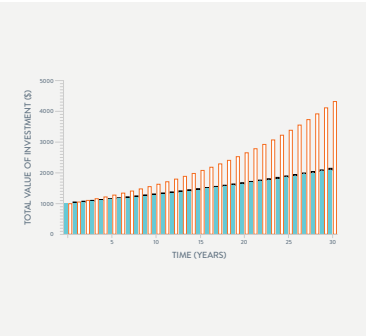
Graph 1: Simple Interest vs. Compound Interest

- *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 spending or 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 spent*
- *Whether you spend your interest or not is under your control*
- *To increase interest earnings, allow your savings to grow uninterrupted*
- *Withdrawing from your long-term savings investments severely limits the effects of compound interest*

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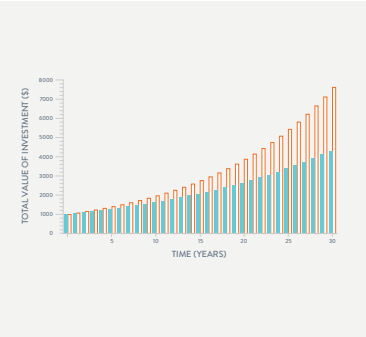
ACTIVITY B ANSWER KEY

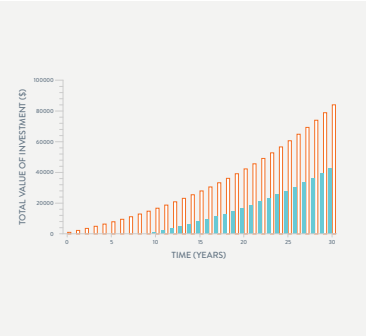
Compound Interest

INTERPRETING GRAPHS



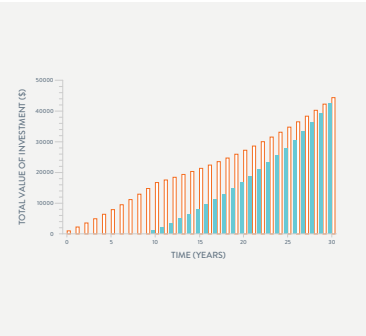
Graph 4: Interest Rate

- *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 on your savings goals limits the amount of interest you can earn*



Graph 6: Starting Early and 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*

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QUIZ ANSWER KEY

Compound Interest

MULTIPLE CHOICE

Directions: CIRCLE the best possible answer for each question.

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. The Rule of 72 is used to estimate:
   a. How much your investment will be worth when you retire
   (b.) How long it will take for your investment to double in value
   c. How long it will take for your investment to earn $72 of interest
   d. How much money you should put into an investment

/4 pts

TRUE OR FALSE

Directions: CIRCLE either true or false.

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 — The Rule of 72 only works for investments with compound interest.

/4 pts