TIME VALUE OF MONEY MAGIC!

TAKE CHARGE TODAY
Financial Education for a Better Future

Active Learning Tool
www.takechargetoday.arizona.edu

THE UNIVERSITY OF ARIZONA
Center for the Philosophy of Freedom

RECOMMENDED GRADE LEVELS	AVERAGE TIME TO COMPLETE	EACH LESSON PLAN IS DESIGNED AND CONTINUALLY EVALUATED "*BY EDUCATORS, FOR EDUCATORS*." THANK YOU TO THE FOLLOWING EDUCATORS FOR DEVELOPING COMPONENTS OF THIS LESSON PLAN.
All	**Facilitation**: 10 minutes	▪ Kathie Beck, Family and Consumer Sciences Educator, Holland, Michigan ▪ Shelly Stanton, Business Educator, Billings, Montana ▪ Margie Chinadle, Family and Consumer Sciences Educator, Rudyard, Montana

NATIONAL STANDARDS	LESSON PLAN OBJECTIVES
See the lesson plan from which you are integrating concepts for an applicable list of standards.	Upon completion of this lesson, participants will be able to: ▪ Understand compounding interest

MATERIALS

MATERIALS PROVIDED IN THIS LESSON PLAN	MATERIALS SPECIFIC TO THIS LESSON PLAN BUT AVAILABLE IN A SEPARATE DOWNLOAD	MATERIALS TO ACQUIRE SEPARATELY DEPENDING ON OPTIONS TAUGHT
▪ How Do You Save Your Beans? 3.0.25.A1	▪ Time Value of Money Magic PowerPoint presentation 3.0.25.G1 ▪ Video tutorial	▪ Jelly Beans (or other candies or markers) ▪ 2 clear containers (Ziploc sacks, clear bowl, graduated cylinder, clear piggy bank, etc.) ▪ Containers to hold jelly beans (Ziploc sacks, Dixie cups, etc.)

RESOURCES

EXTERNAL RESOURCES

External resources referenced in this lesson plan:

▪ None available

TAKE CHARGE TODAY RESOURCES

Similar lesson plan at a different level:	Optional lesson plan resources:
▪ None available	▪ Pay Yourself First 1.4.1 ▪ Choose to Save 2.4.1

CONTENT

The time value of money is one of the most important concepts in personal finance. Use the visual demonstration provided in this lesson to illustrate the power of compounding interest and the time value of money. The demonstration uses colored jelly beans and an interactive graph to show how money can "magically" grow with interest.

LESSON FACILITATION

PREPARE *Visual indicators to help prepare the lesson*	INSTRUCT *Instructions to conduct the lesson facilitation*	CUSTOMIZE *Potential modifications to lesson facilitation*

RECOMMENDED FACILITATION

Approximate time: 30 minutes

Materials to prepare:

- *Time Value of Money Magic PowerPoint presentation* 3.0.25.G1

For Student Hands on Participation:

- 1 bag of skittles or other small tokens per participant
- 2 clear cups or Ziplocs per pair of students

For Demonstration:

- Large bag of jelly beans with at least 6 different colors
- 2 clear objects to hold jelly beans (Ziploc bag, clear bowl or tall, clear cylindrical container).
- Ziploc bags or Dixie cups labeled as follows:
  - Color 1, Principal= 20 jelly beans
  - Color 2, Year 1= 1 jelly beans
  - Color 3, Year 5= 3 jelly beans
  - Color 4, Year 10= 6 jelly beans
  - Color 5, Year 15= 8 jelly beans
  - Color 6, Year 20= 11 jelly beans
- **Optional:** 1 *How Do You Save Your Beans?* 3.0.25.A1 per person

Rather than candies, use green noodles to represent principal and white noodles to represent interest.

1. **Prepare for the Time Value of Money Magic! Demonstration:**
   a. Purchase a large bag of Jelly Beans.
      i. The graph on the *Time Value of Money Magic PowerPoint presentation* 3.0.25.G1 corresponds to the eight standard colors of jelly beans: orange, purple, yellow, green, red, pink, black, and white.
   b. Obtain two clear objects to hold the candies during the demonstration.
      i. This could include a Ziploc bag or clear bowl. A clear, tall, cylindrical container (such as a graduated cylinder used in science labs) would work really well to show the gradual increase of jelly beans and change of colors.
   c. Color code and divide the jelly beans into the following numbers. To help organization, place the beans in a Ziploc sack or Dixie cup with a label on the outside that includes: number of beans, color, year, interest, and amount savings is worth.
      i. Color 1, Principal= 20 jelly beans
      ii. Color 2, Year 1= 1 jelly beans
      iii. Color 3, Year 5= 3 jelly beans
      iv. Color 4, Year 10= 6 jelly beans
      v. Color 5, Year 15= 8 jelly beans
      vi. Color 6, Year 20= 11 jelly beans
         1. The graph on the *Time Value of Money Magic PowerPoint presentation* 3.0.25.G1 corresponds with the use of the following colors:
            a. White- 10

b. Orange-1
c. Purple-3
d. Yellow-6
e. Green-8
f. Red-11

d. Give each pair of students a bag of Skittles or tokens and a container

2. **Complete the Time Value of Money Magic! demonstration with student participation:**
   a. Have students pair up to combine their Skittles and to work together**.**
   b. Ask participants, "Can money magically grow?"
   c. Explain to participants that although it is not magic, money can grow on its own if the time value of money is utilized. Interest allows money to grow on its own.
   d. Ask students to complete the time value of money experiment at their seats with their supplies while you demonstrate
   e. Place 10 tokens in <u>each</u> clear container. One container will represent money saved at a depository institution. The other container will represent money saved somewhere else that does not pay interest (piggy bank, home, etc.)
      i. Explain to participants that each token represents $10.00. Therefore, this represents a $100.00 initial savings amount.
      ii. Explain what each container represents (depository institution versus "other"). Set the "other" container aside, because it is not earning interest. It will be referred to at the end of the demonstration.
   f. Add 1 token of a different color to the "depository institution" container.
      i. Start the graph on the *Time Value of Money Magic PowerPoint presentation* 3.0.25.G1. The first animation explains that $7.00 in interest was earned over the first year, so the savings is now worth $107.00. The jelly bean added to the initial savings represents this $7.00 (rounded up).
      ii. Explain to participants that the owner of this savings has earned $7.00 and he/she didn't do anything! It's magic!
   g. Add 3 tokens of a different color to the clear container.
      i. Continue with the graph on the PowerPoint. Explain the second animation for year 5 of the savings.
   h. Add 6 tokens of a different color to the clear container.
      i. Continue with the graph on the PowerPoint. Explain the third animation for year 10 of the savings.
   i. Add 8 tokens of a different color to the clear container.
      i. Continue with the graph on the PowerPoint. Explain the fourth animation for year 15 of the savings.
   j. Add 11 tokens of a different color to the clear container.
      i. Continue with the graph on the PowerPoint. Explain the fifth animation for year 20 of the savings.
   k. *Note to educator:* If time allows, the demonstration can be continue to year 50. This would require an additional 257 tokens. The number of tokens needed for each year would be:

The demonstration may not be needed if the students are completing the activity at their seats.

Token refers to the Skittles, Jelly Beans, Stones or other marker used.

i. Year 25= 16 jelly beans or tokens
ii. Year 30= 22 jelly beans or tokens
iii. Year 35= 31 jelly beans or tokens
iv. Year 40= 43 jelly beans or tokens
v. Year 45= 60 jelly beans or tokens
vi. Year 50= 85 jelly beans or tokens

l. Continue with the graph on the PowerPoint. Explain to participants that at year 50 the savings would be worth $2945.70 and would earn $845.46 in interest alone.

m. Bring out "other" container that did not earn interest. Show participants the difference that interest makes. Remind them that they didn't have to do a thing!

n. Ask participants to look for the token that represent the initial savings (our example uses white jelly beans).
    i. Explain to participants that these represent the only money that was actually provided by the saver. All of the other colored jelly beans represent free money in the form of interest earned.

3. **Discuss the demonstration.**
    a. Ask participants the following discussion questions:
        i. What would have happened if you had added to the investment every year?
        ii. What would you have done with $100 instead of save it? Is that purchase worth more than $2,945.70?
    b. Go to slide 3 of the *Time Value of Money Magic PowerPoint presentation* 3.0.25.G1. Ask participants to contemplate the following, "Which is worse - Spilling the beans or never having them?"
        i. Discuss how it is better to have savings and spend it then to never have savings.
    c. **Optional**: Have participants complete *How Do You Save Your Beans?* 3.0.25.A1.

The following table summarizes the time value of money calculations and beans used in this demonstration. This table may be used as a "cheat sheet" during the demonstration.

Year	Jelly Bean Color	Number of Jelly Beans	Amount Savings is Worth	Interest Earned in that Year
Initial Savings	White	10	$100.00	0
1	Orange	1	$107.00	$7.00
5	Purple	3	$140.26	$33.26
10	Yellow	6	$196.72	$56.46
15	Green	8	$275.90	$79.19
20	Red	11	$386.97	$111.07
25		16	$542.74	$155.77
30		22	$761.23	$218.48
35		31	$1,067.66	$306.43
40		43	$1497.45	$429.79
45		60	$2,100.25	$602.80
50		85	$2,945.70	$845.46

How Do You Save Your Beans?

	Total Points Earned
8	Total Points Possible
	Percentage

Name _____

Date _____

Class _____

1. How old are you in years?

2. How could you obtain $100?

3. What would you spend $100 on today?

4. How old will you be in 20 years?

5. What would you spend approximately $380 dollars on at that time?

6. How old will you be in 50 years?

7. What would you spend approximately $2800.00 on at that time?

8. What is one thing you will do after learning about the “Time Value of Money?”