

Mathematical Context

Mathematical Goals for the Lesson (from T-1 of Lesson Plan):

The *Representing Linear and Exponential Growth* lesson is designed to assess how well students are able to:

- Translate between descriptive, algebraic, tabular, and graphical representation of the functions.
- Recognize how and why a quantity changes per unit interval.

Discussion Questions to Develop the Big Mathematical Picture¹

1. What big mathematical relationships, patterns, or principles do we want students to understand in this lesson?
2. What is one or more key mathematical understanding(s) that this lesson builds upon? What is one or more key mathematical understanding(s) that this lesson builds towards? What connects those understandings?
1. How might different representations or solution strategies within the lesson connect to each other in order to deepen our students' mathematical understandings?

Directions for the Mathematical Activity:

Work in groups of two or three. You will receive cut-up copies of *Card Set: Investment Plans and Formulas*, *Card Set: Graphs*, *Card Set: Tables*, and *Card Set: Statements*.

When working together, take turns to:

1. Select a formula card to match with a corresponding investment plan card.
2. Continue to match the *Graphs* and *Tables* cards with the sets already matched and calculate the missing value on each table.
3. Check work with neighboring groups and discuss any differences between the matches.
4. Each group will match a *Statements* card to the previously matched card set.
5. Glue all the matched cards on the poster paper and write an explanation for the matches next to the cards.

For the version of these instructions for students, see T-6

Discussion Questions Focusing on the Mathematical Activity

1. What are some different mathematical approaches for completing the task?
2. What is a big mathematical idea present in this lesson?
3. How do the tasks in the lesson provide opportunities for all students to engage in meaningful participation towards important mathematical ideas?

¹ From: TRU Math Conversation Guide

Mathematical Context Materials

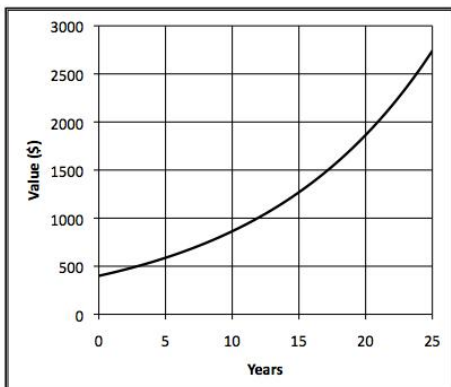
Directions: Cut out the Card Sets on the next four pages to form the cards for the matching activity. Give one set to each group of two or three.

Card Set: Investment Plans and Formulas

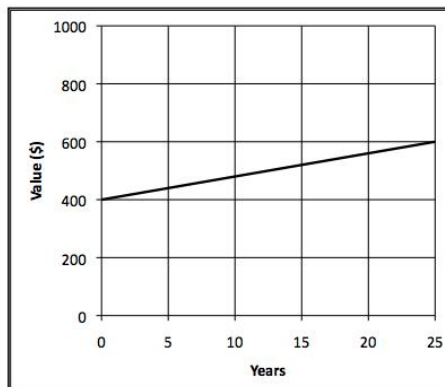
P1 Investment: \$400 Simple Interest Rate: 16%	P2 Investment: \$400 Compound Interest Rate: 2%
P3 Investment: \$400 Simple Interest Rate: 8%	P4 Investment: \$200 Compound Interest Rate: 2%
P5 Investment: \$400 Compound Interest Rate: 8%	P6 Investment: \$400 Simple Interest Rate: 2%
F1 $A = 400 \times 1.08^n$	F2 $A = 400 + 32n$
F3 $A = 400 \times 1.02^n$	F4 $A = 400 + 8n$
F5	F6

Card Set: Graphs

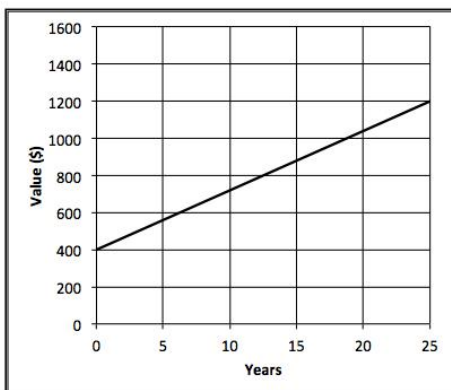
G1



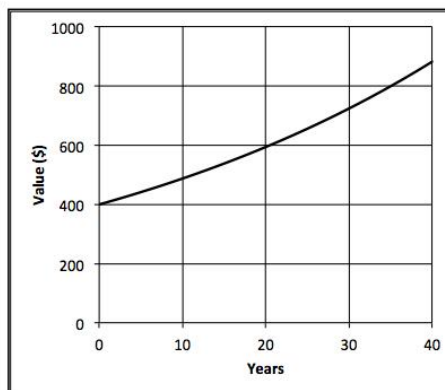
G2



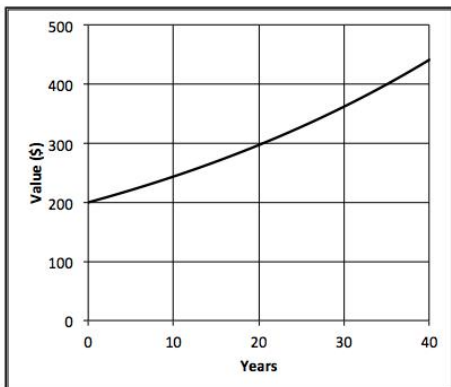
G3



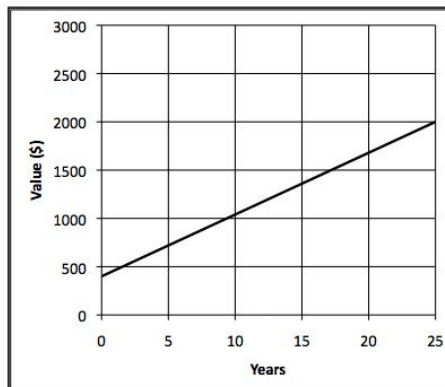
G4



G5



G6



Card Set: Tables

T1

Years	Value (\$)
0	400.00
1	432.00
2	466.56
3	
4	544.20
5	587.73

T2

Years	Value (\$)
0	200.00
1	204.00
2	
3	212.24
4	216.49
5	220.82

T3

Years	Value (\$)
0	400.00
1	408.00
2	
3	424.00
4	432.00
5	440.00

T4

Years	Value (\$)
0	400.00
1	408.00
2	
3	424.48
4	432.97
5	441.63

T5

Years	Value (\$)
0	400.00
1	432.00
2	464.00
3	
4	528.00
5	560.00

T6

Years	Value (\$)
0	400.00
1	464.00
2	
3	592.00
4	656.00
5	720.00

Card Set: Statements

S1 These two investments will take the same time to double your money.	S2 This investment will double your money in 12 years 6 months.
S3 This investment gives the worst return for your money over two years or more.	S4 This investment is the best one over 10 years.
S5 This investment is the best one over 20 years.	