

# M104: Modeling with Functions of Exponential Type

## Pre-Badge Task

Name: \_\_\_\_\_

Teacher: \_\_\_\_\_

### New Badge Alert!

This task will provide a preview of what we will be learning during the M104 - Modeling with Functions of Exponential Type Badge. You already know so much math, so use this task to share any understanding that you have before we start our learning. You will have a chance to do the same task at the end of the badge to see how your thinking has evolved.

### The Task

You decide to purchase your first car. You decide on a Subaru Crosstrek, which is valued at \$21,500 at the time of purchase. The table below indicates the value of the car, in dollars, over the first 4 years that you own it.

Year	0	1	2	3
Value (dollars)	21,500	18,920	16,650	14,652

**QUESTION 1** What do you notice about the data provided in the table above?



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**QUESTION 2** What is the approximate percentage that the value of the car is depreciating each year?



**QUESTION 3** Write an equation that represents the value,  $y$ , (in dollars) of the car after  $x$  years.



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**QUESTION 4** Graph the curve represented by your equation. You can use graph paper or technology to create your graph.



[Attach a file with your work or describe how to find it if it is stored online.]

**QUESTION 5** Why is the graph shaped this way? Explain your answer.



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**QUESTION 6** How many years will it take for your car to be worth less than \$6000? Explain how you determined this.



**QUESTION 7** Does the car lose the same dollar amount each year? Explain your answer.

