Name_____ Date_____

Using Code to Represent Linear Patterns in Real-Life Contexts

Let's represent patterns in real-life contexts through coding lists in Scratch.
We'll begin with the code we used in Line Master 2.

https://scratch.mit.edu/projects/795444171/editor/

```
when [flag] clicked
set termNumber ▼ to 0
delete all of termValueList ▼
delete all of termNumberList ▼
repeat until termNumber > 5
    add termNumber to termNumberList ▼
    set termValue ▼ to 3 * termNumber + 0
    add termValue to termValueList ▼
    say termValue for .25 seconds
    change termNumber ▼ by 1
```
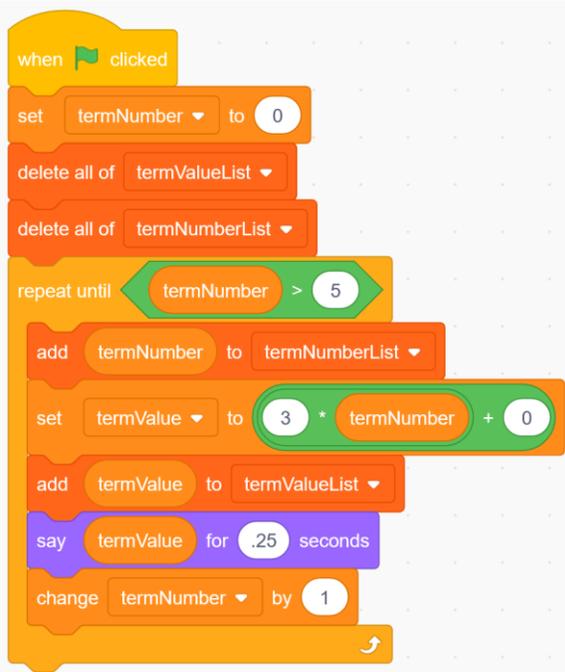
If you have a Scratch login,
save the project in your Scratch
account by selecting **Remix**
at the top of the screen.
A login is not required to work with
the code, but you will not be able to
save your changes without it.

Two real-life scenarios are presented on the following pages.
Represent each of these real-life patterns by altering the code
in this Scratch application.

The real-life scenario in **Part 1** includes guided materials.
Work through **Part 1** before trying to represent the real-life
pattern using code in **Part 2**.

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Using Code to Represent Linear Patterns in Real-Life Contexts (cont'd)

Part 1: Buying Vinyl Records

Ty has decided to purchase used vinyl records from an online store for their DJ business.

The store charges a flat rate of $25 for shipping and each record costs $5.25.

Ty would like to determine the cost of purchasing 1 through 50 records.

Altering the Code for the Vinyl Records Scenario

1. Since Ty would like to determine the cost of purchasing 1 through 50 records, let's set the starting value in **termNumber** to **1** at the beginning of the code.

2. To ensure the cost of up to and including 50 records is displayed in the list, alter the code in the defined count part of the **Repeat** to **termNumber > 50**.

3. The shipping cost is a flat rate, so alter the initial value in your expression to 25.

   The cost per record is $5.25, so alter the constant rate in your expression to 5.25.

Mathology 7, *Coding*
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Algebra
Unit 3 Line Master 3c

Using Code to Represent Linear Patterns in Real-Life Contexts (cont'd)

4. Finally, although this code will display the information Ty is looking for when it is executed, rename the variables and lists to have more meaningful names.

- Under **Variables**, right-click on **termNumber** and rename this variable **numRecords**.
- Rename the **termValue** variable **cost.**
- Rename the **termNumberList** to **numRecordsList.**
- Rename the **termValueList** to **costList.**

Your code should look like this:

5. Execute the code by clicking on the **green flag**. After scrolling down, the numbers at the bottom of the lists should look like those on the right.
If they do not, debug your code by checking if it matches the code above.

**Algebra
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Using Code to Represent Linear Patterns in Real-Life Contexts (cont'd)

6. a) From your lists, determine the cost to buy 1, 10, 20, 30, 40, and 50 records.

   b) For each number of records in part a, calculate the cost per record including shipping. Round your answers to the nearest cent, where necessary.

   c) If you were Ty, how many records would you buy to make the cost of shipping worthwhile? Explain your reasoning.

Part 2: Family Reunion Hall Rental

> Grace has a part-time job helping out an event planner.
> Grace has been asked to look into renting a hall for a client
> who is hosting a family reunion.
> Grace is to determine the cost for between 50 and 150 guests
> and display this information for every 10 people.
> The first venue Grace contacts will charge a flat rate of $750 plus
> an additional fee of $5.50 per person. This includes tables, chairs,
> and all other supplies, including the use of a kitchen for warming up food,
> but not the food itself.

1. Alter the code to represent this real-life scenario.
   Use the following variable and list names:
   numPeople
   numPeopleList
   cost
   costList

Using Code to Represent Linear Patterns in Real-Life Contexts (cont'd)

2. a) What will you use as the starting value for **numPeople**?

   b) How will you alter the defined count part of the code?

   c) What values will you use for the initial value and constant rate?

   d) How will you change the code so the number of guests increases by 10 at a time?

3. How much will the hall rental cost for 50 guests? 100 guests? 150 guests?

4. Suppose Grace finds a different hall that charges a flat rate of $1500 for up to 150 guests and provides the same services. Which hall would you recommend to the client? What factors might affect your answer?