Using Code to Represent Linear  
 Patterns in Real-Life Contexts

**Algebra**

**Unit 3 Line Master 3a**

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.

Graphical user interface

Description automatically generated<https://scratch.mit.edu/projects/795444171/editor/>

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**.

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

**Algebra**

**Unit 3 Line Master 3b**

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**

Graphical user interface

Description automatically generated 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**.

Graphical user interface, application

Description automatically generated3. 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.

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

**Algebra**

**Unit 3 Line Master 3c**

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 termNumberand 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:

Graphical user interface

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**Chart, bar chart

Description automatically generated**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.

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

**Algebra**

**Unit 3 Line Master 3d**

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)

**Algebra**

**Unit 3 Line Master 3e**

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?