

**DATA MANAGEMENT AND PROBABILITY**

**GRADE 2**

**ONTARIO EDITION**

*hands-on*  
**mathematics**

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# Introduction

In this module, students collect and organize information/data using various strategies. Students also interpret this data, draw conclusions from it, and then extend the information.

There are three primary goals for this module. The first goal is to strengthen and enhance students' abilities to collect, record, and interpret data, using a variety of data management tools. The second goal is to develop students' understanding of probability and chance. The third goal is to enhance students' mathematical vocabulary and language skills in the areas of data management, statistics, and probability, through both verbal and written communication.

Ultimately, this module gives students the opportunity to apply the concepts of probability and statistics to their everyday lives.

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**Note:** Many of the lessons in this module have multiple steps that should be completed over several class periods.

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## Mathematics Vocabulary

Throughout this module, teachers should use, and encourage students to use, vocabulary such as: *data, information, survey, tally, chart, Venn diagram, pictograph, bar graph, line plot, probability, likely, unlikely, probably, expect, always, never, and chance*. Also, consider adding these terms to your classroom Math Word Wall as they are introduced in each lesson.

# 2 Sorting and Graphing Apples

## Materials

- a variety of apples (You will need at least three varieties/colours of apples: one red, one green, and one gold apple. Have enough apples for each student to taste a piece of each variety.)
- knife
- paper plates
- pencils
- apple templates (included. Photocopy, and cut apart along dotted lines. You will need two paper apples per student.) (2.2.1)
- crayons, pencil crayons, or markers
- scissors
- chart paper
- markers
- overhead transparencies of Activity Sheet A (2.2.2) and Activity Sheet B (2.2.3)
- overhead projector
- non-permanent overhead markers
- two Hula-Hoops (or two long pieces of string, formed into loops)
- large sheet of Bristol board
- index cards
- round dot stickers

## Activity: Part One: Sorting Apples

Display the collection of apples, and have students examine them. Ask:

- How are these apples the same?
- How are they different?

Discuss the colour and size of the various apples. Ask:

- Can you put the apples in order from smallest to largest? Lightest to heaviest?

As a class, put the apples in order by these criteria. Ask:

- How can we sort the apples?

Brainstorm sorting rules, and have students sort the apples in a variety of ways. Discuss sorting rules and attributes (colour, shape, stem/no stem, texture, and so on).

## Activity: Part Two: Graphing Apples on a Pictograph

**Safety Note:** In this activity, students taste apples. Be aware of any student allergies before doing the activity.

Select three varieties/colours of apples to use for this graphing activity. Display the apples, and discuss their names and features. Explain to students that they will each taste the three varieties of apples and pick their favourite. Ask:

- Which apple do you think you will like the best?

Provide each student with a paper plate. Ask:

- How could we divide each plate into three equal parts?

Discuss students' ideas, using the opportunity to talk about fractions. Then, have students draw pencil lines on their plates to divide them into three sections, one for each type of apple. Have students label the sections with the names of the three varieties of apples.

Now, cut up the apples so that there is one piece of each variety for each student. Leave one apple of each variety intact to serve as an example.

**Safety Note:** Be sure students wash their hands before and after handling the apples.

Distribute the apple pieces, and have students place them on the appropriately labelled sections on their paper plates. Then, have students sample each variety of apple and decide which kind they like best.

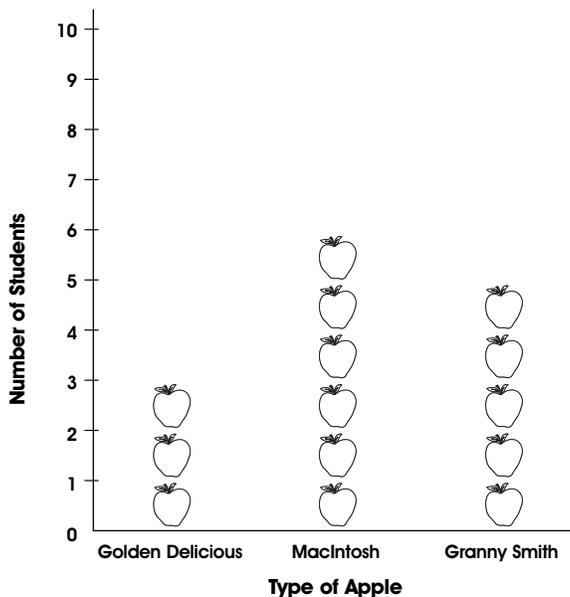
# 2

When students have decided on their favourites, give each student a blank apple template (2.2.1), and have students colour their apples the same colours as their favourite types of apples. Also, have students write their own names on their paper apples, and cut the apples out.

**Note:** Encourage students to colour their paper apples as accurately as possible, looking closely at the colours on the real apples and trying to replicate them. This may mean having two shades or colours on one paper apple, since many apples are not one solid colour.

Explain to students that they will now graph the results of this activity to show what type of apple each student in the class likes best. With student input, draw a large pictograph on chart paper. Have students place their coloured paper apples in the correct locations on the graph, as in the example below:

**Our Favourite Apples**



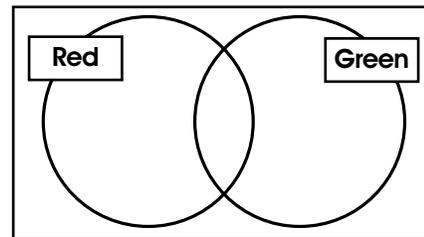
When the pictograph is complete, discuss the data by asking students:

- Which is the favourite variety of apple?

- Which is the least favorite variety of apple?
- How many more students like MacIntosh apples than Golden Delicious apples?

### Activity: Part Three: Sorting Apples on a Venn Diagram

Place two Hula-Hoops or string circles on a large sheet of Bristol board to create an intersecting Venn diagram. Use two index cards to label the circles “Red” and “Green,” as in the following example:



Provide each student with another apple template and again have each student colour his/her paper apple the colours of the apple variety he/she likes best. Have students cut out their paper apples and print their own names on them.

Now, have students look carefully at the Venn diagram. Ask:

- If your apple is completely green, where on the Venn diagram should you put your apple? What if your apple is completely red?
- Where should you put an apple that is both red and green?
- Where should you put a yellow apple?

Have students put their paper apples in the correct location on the Venn diagram.

### Activity: Part Four: A Survey About Apples

Explain to students that they will now complete surveys to find out the different ways students like to eat apples. Brainstorm with students

# 2

for ideas of how apples can be prepared. For example: apple pie, apple crisp, apple sauce, caramel apple, baked apple, dried apple, apple chips.

Display the overhead copy of Activity Sheet A (2.2.2). Explain to students that they must first choose three “ways” of eating apples for their surveys and print these at the tops of their charts. Then, they will survey their classmates to find out which of those three ways of eating apples each student prefers.

Remind students that they need to record the names of students they question, to ensure that they survey the entire class. When they complete their surveys, students will also need to calculate the total number of names they have recorded in each column of their charts.

Allow students time to circulate and collect data. During this time, complete the survey process yourself, and record results on your transparency copy of Activity Sheet A (2.2.2), to use later for demonstration.

## Activity Sheet A

### Directions to students:

Choose three “ways” of eating apples, and record these on your chart. Survey your classmates to find out which of these ways of eating apples is each student’s favourite (2.2.2).

When students have finished collecting their information, explain that they will now transfer the information onto a bar graph. Display the overhead transparency of Activity Sheet B (2.2.3). Remind students that the bars on a bar graph should have spaces between them.

Discuss the data you collected on your copy of Activity Sheet A (2.2.2) by showing students your apple foods survey and asking:

- Which “way” of eating apples is the favourite?

- Which “way” of eating apples is the least favourite?

Distribute Activity Sheet B (2.2.3), and have students use the data they collected from their apple foods surveys (2.2.2) to complete their own bar graphs.

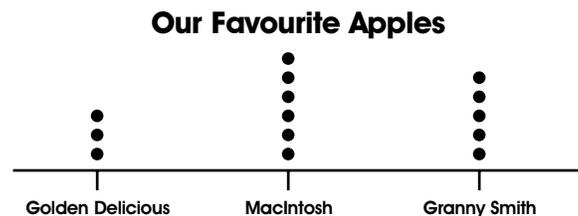
## Activity Sheet B

### Directions to students:

Use the data from your survey to construct a bar graph that shows your classmates’ favourite ways of eating apples (2.2.3).

## Activity: Part Five: Line Plots

As a class, use line plots to graph the results from Activity: Part Two and Activity: Part Four. Create large line plots on graph paper. Use coloured dot stickers as plotting dots, as in the example below:



## Problem Solving

An average person eats 3 apples per week. How many apples would an average person eat in a month? How many apples would 10 average people eat in a week? How many apples would a class of students the size of yours eat in a week?

**Note:** A reproducible master for this problem can be found on page 86.

# 2

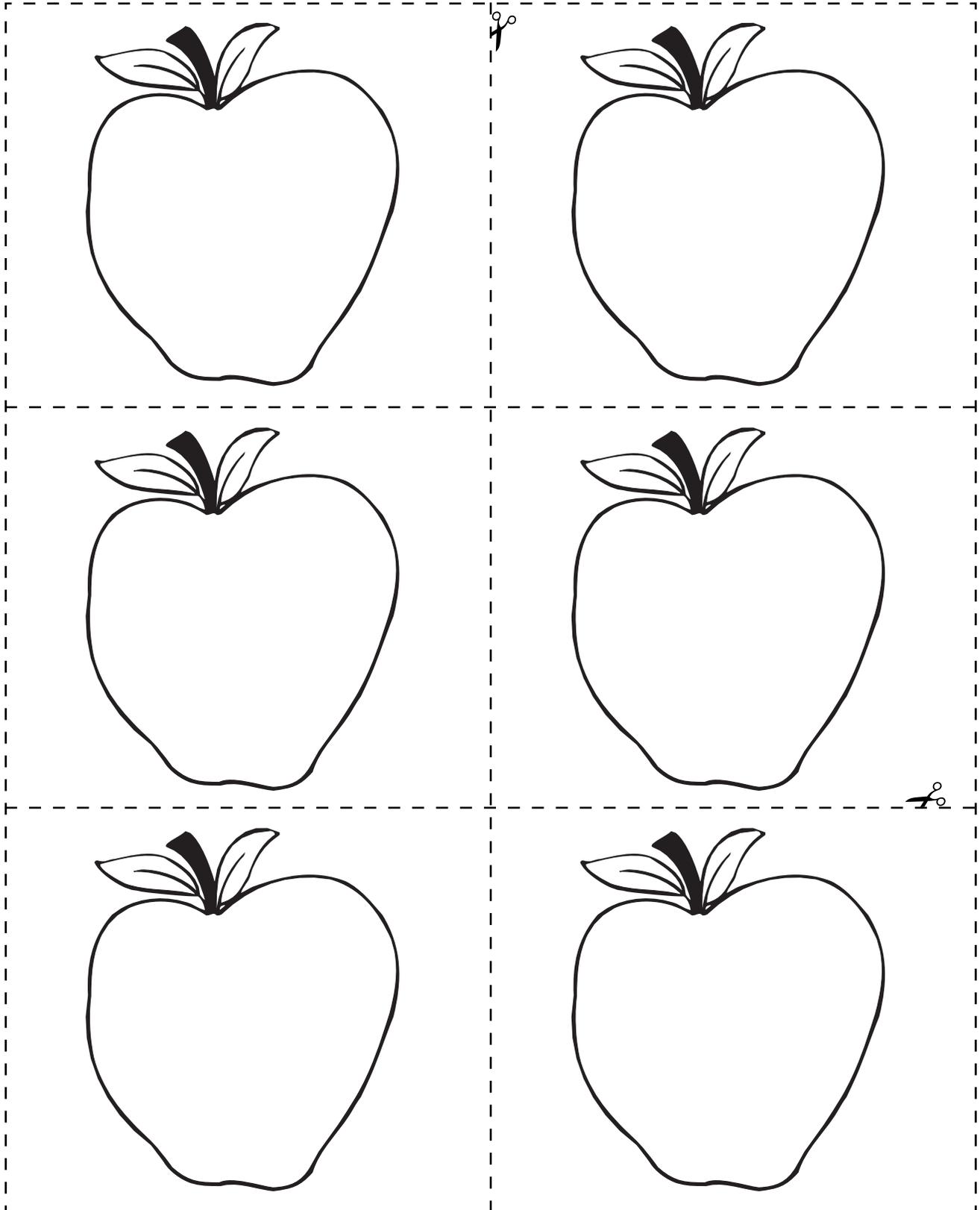
## Extensions

- Add the terms *Venn diagram*, *data*, and *information* to your classroom Math Word Wall.
- Plan a field trip to a grocery store. Visit the produce department to do further research on apple varieties. Prepare a list of questions to ask the produce manager.
- Collect apple recipes, and create a class cookbook. Test each recipe by making it in class.

## Assessment Suggestion

Distribute math journal sheets (page 25), and have students record what they learned during the survey process and by preparing their bar graphs (Activity: Part Three).

# Apple Templates





# Our Favourite Ways of Eating Apples

