Statistics and Probability
Grade 2
Manitoba Edition

hands-on mathematics

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Contents

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.

The primary goal for this module is to strengthen and enhance students' abilities to collect, record, and interpret data, using a variety of data management tools. A second goal is to enhance students' mathematical vocabulary and language skills, in the area of data management, through both verbal and written communication.

Throughout the module, students will be provided with opportunities to construct and interpret concrete graphs, pictographs, charts, tallies, and glyphs.

Mathematics Vocabulary

Throughout this module, teachers should use, and encourage students to use, vocabulary such as: *data, information, survey, tally, chart, Venn diagram, concrete graph, pictograph*. Also, consider adding these terms to your classroom Math Word Wall as they are introduced in each lesson.

7 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.) (2.7.1)
- crayons, pencil crayons, or markers
- scissors
- chart paper
- markers
- overhead transparency of Activity Sheet A (2.7.2)
- 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

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.

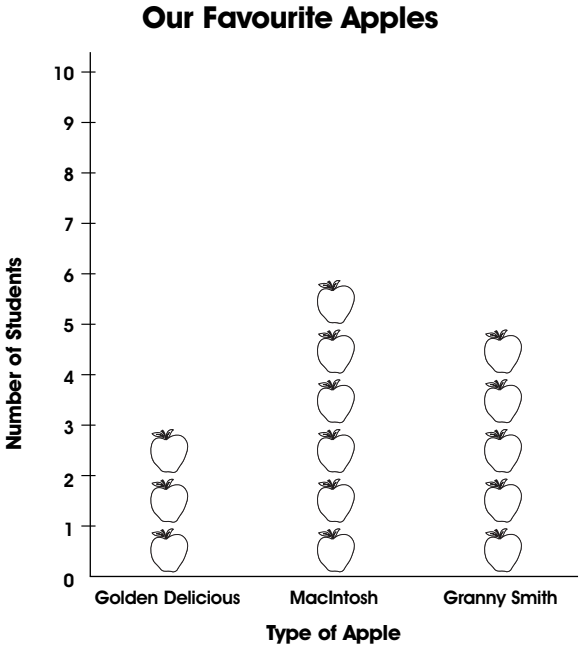
Distribute the apple pieces, and have students place them on the appropriately labelled sections on their paper plates. Then, have students sample each variety of apple and decide which kind they like best.

When students have decided on their favourites, give each student a blank apple template (2.7.1), 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:

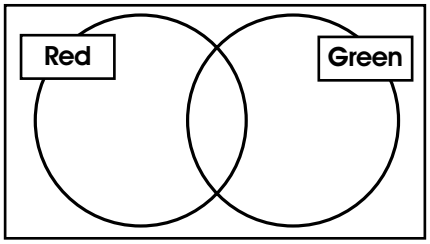


When the pictograph is complete, discuss the data by asking students:

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

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Display the overhead copy of Activity Sheet A (2.7.2). 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.

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 (2.7.2).

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.

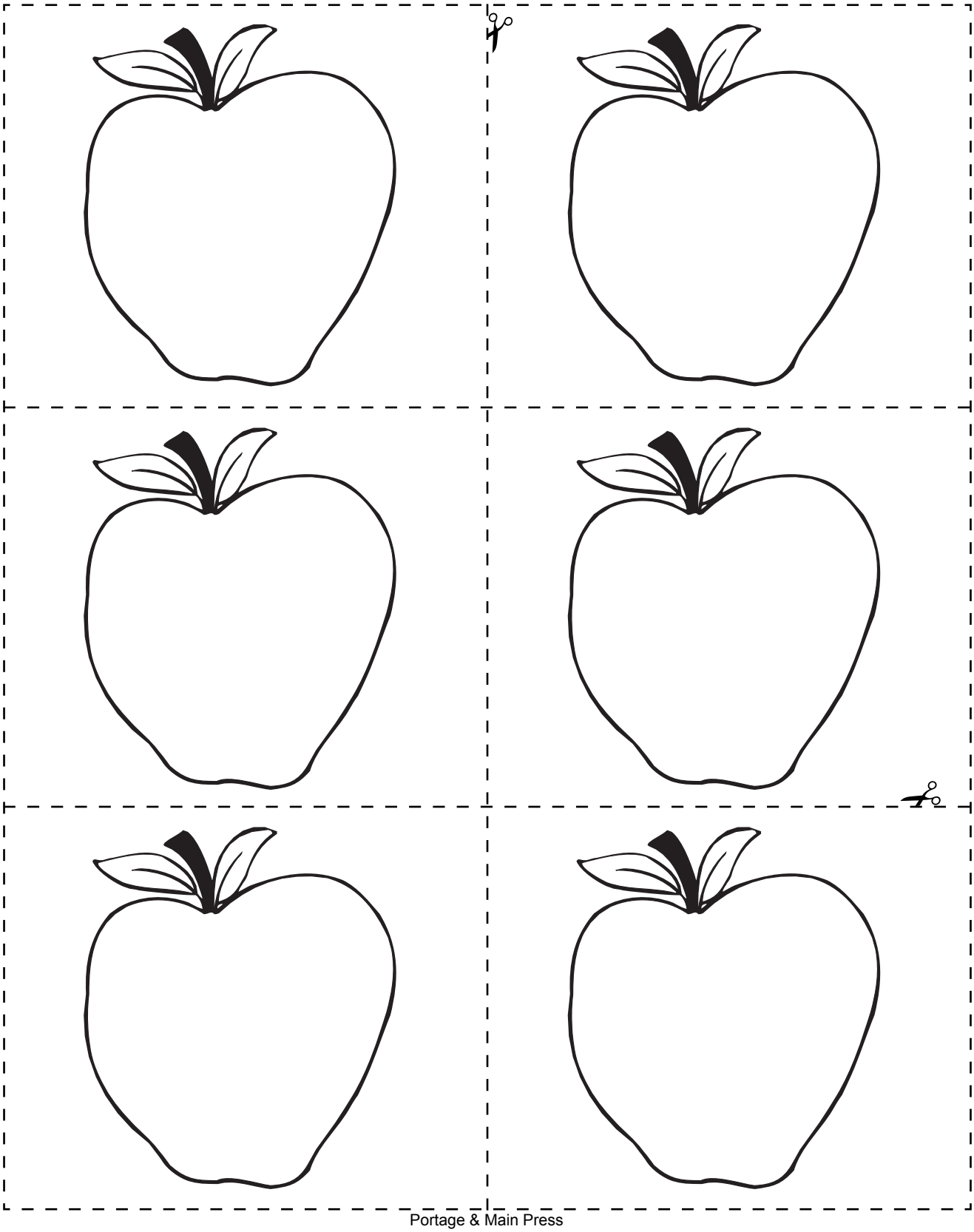
Extensions

- 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

Have students record in their math journals what they learned during the sorting and survey processes. Use copies of the Math Journal sheet, found on page 22.

Apple Templates



Date: _____ **Name:** _____

Ways of Eating Apples Survey

Name	Ways of Eating Apples		
Total			