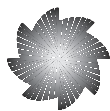


hands-on **mathematics**

**GRADE
THREE**

SAMPLE



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Introduction to *Hands-On Mathematics*

Program Implementation

Program Resources

Hands-On Mathematics is arranged in a format that makes it easy for teachers to plan and implement.

Units are the selected topics of study for the grade level. The units relate directly to the learning outcomes identified herein, which complement those established in the *Western Canadian Protocol for Mathematics*.

The introduction to each unit summarizes the general goals for the unit and provides background information for teachers. Each unit begins with a list of books for students that relate to the unit; a list of related websites (for all units combined) can also be found on page 114.

Each unit is organized into lessons, based on the learning outcomes. The lessons are arranged in the following format:

Background Information for Teachers:

Some topics provide teachers with the basic mathematical knowledge they will need to present the activities. This information is offered in a clear, concise format and focuses specifically on the topic of study.

Materials: A complete list of materials required to conduct the main activity is given. The quantity of materials required will depend on how you conduct activities. If students are working individually, you will need enough materials for each student. If students are working in groups, the materials required will be significantly reduced.

Mental Math: Mental math strategies, to be used in all lessons, are provided (see page 26).

Activity: This section details a step-by-step procedure, including higher-level questioning techniques and suggestions for encouraging active inquiry and discussion.

Activity Sheets: Reproducible activity sheets have been designed to correlate with the specific learning outcomes of the activity. Many of these are used during the activity to record results of investigations. Others are used as a follow-up to the activities. Students may work independently on these sheets, in small groups, or you may choose to read through the sheets together and complete them in a large group setting. Activity sheets can also be made into overheads or large experience charts. Since it is also important for students to learn to construct their own charts and recording formats, these activity sheets can be used by the teacher as examples of ways to record and communicate ideas about an activity.

Problem Solving: Many lessons include suggestions for problem-solving activities that are directly related to the lessons learning outcomes. These problems may be presented orally, acted out with concrete objectives, presented pictorially, or written out on chart paper.

Extensions: Included are optional activities to extend, enrich, and reinforce the learning outcomes.

Activity Centre: Included are independent student activities that focus on the learning outcomes.

Assessment Suggestions: Throughout each unit, several suggestions are made for assessing student learning. Again, these assessment strategies focus specifically on the learning outcomes of a particular activity topic. Keep in mind that the suggestions made within activities are merely ideas to consider.

10 Doubling

Material

- calculators
- Digiblocks or base-ten blocks
- paper
- pencils

Activity: Part One

Present students with the following problem:

Janessa and José are going to work for their parents over the holidays, and their parents will pay them in jellybeans. Both kids will work for 10 days, but each one has asked for a different rate of pay. Janessa asked to receive 100 jellybeans on the first day and 50 jellybeans on each of the following nine days. José asked to receive only 1 jellybean on the first day. For each remaining day, he will receive double the number of jellybeans he received the day before. Who made the better deal, Janessa or José? Why?

Ask students to record their predictions in their math journals, challenging them also to explain their reasoning. Next, have students take turns sharing their predictions and their reasoning. Finally, distribute Activity Sheet A (5.10.1), and have students use the chart to work through the computations and determine the answer. Distribute calculators to students who need help with the addition.

Activity Sheet A

Directions to students:

Determine how many jellybeans Janessa and José will each receive on each day, and how many jellybeans each will receive after 10 days (5.10.1).

Activity: Part Two

Divide the class into groups of five to ten students, and have students in each group sit in a circle. Give each group a block of 1000 Digiblocks (or base-ten blocks) as well as a piece of paper and a pencil. Have the first student in each group take one Digiblock. Then, moving in a clockwise direction, tell each student in the group to take a new set of blocks that is double the number of blocks the previous student took. Have one student in each group record the number of blocks each student takes.

Once students in all groups no longer have enough blocks to continue with the activity, gather students together again, and ask:

- Were the numbers in the sets of blocks that you built odd or even?
- How do you know?
- Could you divide all of the numbers of blocks by 2?
- How do you know?
- How would you know if a number could be divided by 5? Ten?

Distribute copies of Activity Sheet B (5.10.2), and have students double each consecutive number on the grid and then answer each question that follows the grid.

Note: The number at the beginning of a new row on the grid should be double the number at the end of the previous row.

Activity Sheet B

Directions to students:

Double each consecutive number on the grid. Use your calculations to answer each question that follows the grid (5.10.2).

10

Problem Solving

Begin with the number 880. Cut the number in half three times. What number do you end up with? How many times can you cut the number in half again before you have to use fractions (or decimals) to continue halving?

Note: A reproducible master for this problem can be found on page 635.

Activity Centre

At an activity centre, place the following books: *Sea Squares*, by Joy Hulme; *The Rajah's Rice: A Mathematical Folktale from India*, by David Barry; *Anno's Magic Seeds*, by Mitsumasa Anno; and *One Grain of Rice: A Mathematical Folktale*, by Demi. Also, have ready-made, blank booklets (fold together several pieces of white paper, and staple) at the centre. Ask students to read each of the books, all of which deal with doubling and multiplication patterns. Then, have students use blank booklets to create their own doubling books.

Extension

Distribute the extension activity sheet called "Tripling Numbers." Have students triple each consecutive number on the grid and then answer the questions that follow the grid.

Date: _____

Name: _____

How Many Jellybeans?

Day	Janessa	José
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
Total Jellybeans Earned		

After 10 days, Janessa earned _____ jellybeans while José earned _____ jellybeans.

Janessa/José made the better deal.
(circle one)

Doubling Numbers

1		

Can you divide the numbers in the grid evenly by 2? How do you know?

Tripling Numbers

1		

Are the numbers in the grid odd or even? _____

Can you divide the numbers in the grid evenly by 2? How do you know?
