MEASUREMENT
GRADE 3
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hands-on mathematics

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Contents

Introduction

In grade three, students continue to investigate measurement concepts and learn measuring skills that are directly applicable to the world in which they live. In this module, students use whole numbers and, for the most part, standard units of measure to estimate, measure, and compare. Through active, hands-on lessons, students develop their spatial sense and understanding of measurement and become more familiar with standard units of measurement including centimetres, metres, and kilometres.

Because units of measurement in the metric system (System Internationale, or SI) are based on the place-value concept of tens (millimetre, centimetre, decimetre, and so on), students who struggle with this idea may have difficulties grasping some of the measurement concepts. Keep this in mind when planning lessons for students.

Measurement concepts can be challenging for students to master and should be developed over time in meaningful contexts. Consider spreading out the instruction of this module throughout the full school year, rather than teaching it in one block of time. Choose specific concepts and teach these lessons over one-week or one-cycle periods, then continue to build on students' skills in different areas. This way, students will have the opportunity to work with measurement tools throughout the school year and will be able to incorporate these tools and concepts into other activities.

Mathematics Vocabulary

Continue to use your classroom mathematics word wall for displaying new vocabulary as it is introduced. Throughout this module, teachers should use, and encourage students to use, vocabulary such as: *estimate, measure, compare, length, height, distance, perimeter*, *centimetre, metre, kilometre, mass, area, volume, capacity, litre, second, minute, hour, day, week, month, year*, *degrees Celsius (°C), freezing point,* and *boiling point*.

10 Estimating and Measuring the Passage of Time

Materials

- everyday items that relate to time or to the passage of time (for example, a newspaper, a television program guide, a recipe, a birthday card, a calendar, a watch
- passage-of-time labels (included. Photocopy, and cut out each label.) (3.10.1)
- length-of-time cards (included. Photocopy, and cut out each card. Consider mounting cards onto tagboard and laminating. You will need one card for each student.) (3.10.2)
- chart paper
- markers

Activity

Have students sit in a circle. In the centre of the circle, place the everyday items that relate to time or to the passage of time (newspaper, television program guide, and so on). Ask:

- What do all these items have in common?

Record students' suggestions on chart paper, and then remove the items from the circle, explaining that you will come back to them in a little while.

Next, hold up the passage-of-time labels (3.10.1) one at a time. Read the labels aloud as a class. Ask:

- What do all these labels have in common?

Explain that these labels describe different ways of measuring time. Ask students:

- Which is longer, a second or a minute?
- Which is longer, a minute or an hour?
- Which is shorter, a day or a week?
- Which is shorter, a week or a month?
- How many days are there in a week?
- How many months are there in a year?

Spread out the labels in the centre of the circle. Distribute one length-of-time card to each student. Ask students to take a moment to read their card and think about which passage-of-time label is the best fit. Select one student, and ask him/her to read his/her length-of-time card aloud and place it under the appropriate label.

Note: Some cards may fit with more than one label. Ask the student to select the best one.

Continue with this procedure until all students' cards have been sorted.

Return the everyday items that relate to time or to the passage of time (newspaper, television program guide, and so on) to the centre of the circle. Again, ask students:

- What do all these items have in common? (they all contain standard units of measurement that measure the passage of time, or the passage of time is implied)

Discuss the standard unit(s) of time contained in (or implied with) each item. For example:

- newspaper – days, months, years
- television program guide – minutes, hours, days
- recipe – seconds, minutes, hours
- birthday card – years
- calendar – days, weeks, months, years
- watch – seconds, minutes, hours

Distribute Activity Sheet A (3.10.3), and have students record which unit of time is most appropriate to measure the passage of time for each item.

Activity Sheet A

Directions to students:

For each item, record which unit of time (seconds, minutes, hours, days, weeks, months, or years) is most appropriate to measure the passage of time (3.10.3).

10

Problem Solving

Pose a series of questions involving standard units of time for students to solve. For example:

- How many minutes have we been in school today?
- About how many hours have passed since you woke up this morning?
- How old will you be when you begin grade six?
- How many days until your birthday?
- How many minutes until recess?
- How many days until we visit the library?
- About how many months until summer holidays?
- About how many hours until the end of the school day today?

Extensions

- Discuss the importance of using standard units of time in everyday life to measure the passage of time. For example, we need to know how long to bake a cake, to measure the length of various classes during the school day, to know when to attend an appointment.
- Have students make timelines out of long strips of paper (for example, strips of adding-machine paper) and record their activities over a twenty-four hour period.
- Have pairs of students estimate, and time, how long it takes each other to perform various actions/activities (do twenty-five jumping jacks, count to 100, and so on).
- On index cards, have students record, and draw pictures of, daily classroom activities. Use the cards to create a class timeline for each hour of the school day. Use clothespins to attach the cards to a piece of thick string or cord.
- Have students create posters or scrapbook pages that record the passage of time. For example: A Day in the Life of _____ (student's name) or A Year in the Life of _____.
- Create a monthly class newsletter. Have students include items that relate to the passage of time. For example:
  - birthdays for the month and ages of students celebrating the birthdays
  - countdown to upcoming special events
  - weekly or monthly highlights
  - favourite class recipe

Passage-of-Time Labels

minutes
hours
days
weeks
months
years

Length-of-Time Cards

how long you sleep at night	how long it takes you to eat your dinner
how old you are	how long have you known your closest friend
the length of your favourite TV show	how long until the summer holidays

Length-of-Time Cards

how long you have been in grade three	how long until the weekend
how long it takes you to get to school	how long you have been at this school
the length of time it takes to play your favourite sports game	the length of the school day

Length-of-Time Cards

the length of a movie	how old your parents are
how long it would take you to drive to Florida	how long until you get your next haircut
how long until your next birthday	how long until you can drive a car

Length-of-Time Cards

how long until you go to high school	the length of the school year

Date: _____ **Name:** _____

Which Unit of Time?

Item	Unit of Time
the length of your favourite movie	
your age	
how long it takes you to get to school	
how long it takes you to count to 20	
how long you sleep at night	
how much time you spend watching TV each day	
how long it takes you to eat your lunch	
how long until the weekend	
how long until you can drive a car	
the length of your favourite school subject (class)	