

Lesson Summary: Grade 2

Overall Objectives

This lesson will help students to:

- Develop an understanding of halves, thirds, and quarters as parts of a set;
- Estimate quantities using fractions.

Learning Expectations

Students will:

- Compare and order whole numbers using concrete materials, drawings, numerals, and number words to develop an understanding of place value; 2m2
- Compare proper fractions using concrete materials; 2m3
- Use and describe an estimation strategy (e.g., grouping, comparing, rounding to the nearest ten), and check an answer for reasonableness using a defined procedure; 2m7
- Count by 1's, 2's, 5's, 10's, and 25's beyond 100 using multiples of 1, 2, and 5 as starting points; 2m10
- Compare, order, and represent whole numbers to 100 using concrete materials and drawings; 2m14
- Represent and explain halves, thirds, and quarters as part of a whole and part of a set using concrete materials and drawings (e.g., colour 2 out of 4 circles); 2m19
- Compare two proper fractions using concrete materials (e.g., use pattern blocks to show that the relationship of 3 triangles to 6 triangles is the same as that of 1 trapezoid to 2 trapezoids because both represent half of a hexagon); 2m20
- Select and use appropriate strategies (e.g., pencil and paper, calculator, estimation, concrete materials) to solve number problems involving addition and subtraction. 2m33

The code that follows each learning expectation comes from the Ontario Curriculum Unit Planner. See www.ocup.org for further details.

Materials

- Transparent container holding 30 cubes
- Marker
- Plastic bag holding 30 tiles
- Plastic bag holding 50 to 100 tiles (or other small objects) for each pair of students
- Ruler for each pair of students
- “What’s in the Bag?” Recording Sheet (one per student)
- “Comparing Fractions” Recording Sheet (one per student)
- Home Connections – “Estimating in the Kitchen” (one sheet per student)

Approach

Get Started

In a guided learning session:

- Show students a transparent container holding 30 cubes. Ask them to estimate the number of cubes in the container and to explain the strategies they used when estimating.
- Ask students the following questions:
 - How could we make an estimate if we counted only some of the cubes in the container?
 - If we counted approximately half the cubes, how could we estimate the total number of cubes?
- Ask a student to show the halfway point on the container and to draw a line with a marker to indicate $\frac{1}{2}$. Remove and count the cubes from the top half of the container and then ask students to estimate the total number of cubes.
- Reinforce the concept that *half* means that there are two equal parts. If we know approximately half of any quantity, we can double the amount to estimate the whole amount.

Work on It – Model the Activity

In a guided learning session:

- Show students a bag holding 30 tiles. Explain to the students that they will be asked to divide the tiles into 2 roughly equal groups, count the tiles in one of the groups, and then estimate the total number of tiles. Demonstrate how to use a ruler to make roughly equal groups.
- Explain, as well, that the students will repeat the procedure by dividing the tiles into 3 and then 4 roughly equal groups.
- Show students how to complete the “What’s in the Bag?” Recording Sheet.

Work on It – Observe Students

In a shared learning session:

- Provide each pair of students with a bag holding 50 to 100 tiles (or some other small object). Observe how well the students are able to divide the tiles into 2, 3, and 4 roughly equal groups, and how they use $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$ to estimate the total number of cubes. Assist students as needed.
- Probe students’ thinking by asking questions such as:
 - How are you dividing the tiles into roughly equal groups? How do you know that the groups are approximately equal?
 - How can you estimate the total number of tiles by using $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$?

Reflect and Connect

In a guided learning session:

- Help students reflect on the activity and their learning by asking questions such as:
 - Which group had the greatest number of tiles – $\frac{1}{2}$, $\frac{1}{3}$, or $\frac{1}{4}$? Why?
 - Which division gave you the best estimate – $\frac{1}{2}$, $\frac{1}{3}$, or $\frac{1}{4}$? Why?
 - What did you learn about fractions from this activity?
 - What did you learn about estimating from this activity?

Build on Learning

Introduce the following activity in a guided learning session. Students may complete the activity with a partner, as a shared experience, or independently.

- Pose the following problem: There are 12 cubes in this bag. Which is more – $\frac{1}{2}$ of the cubes, or $\frac{2}{3}$ of the cubes?
- Tell the students that they will be working with a partner to find a solution to the problem. Provide each pair of students with the “Comparing Fractions” Recording Sheet, and explain that they will need to draw a picture on the sheet that clearly shows their thinking.
- As students work on the problem, and during a Reflect and Connect session, ask probing questions such as:
 - How do you find $\frac{1}{2}$ of the cubes? How do you find $\frac{2}{3}$?
 - Which is more – $\frac{1}{2}$ of the cubes or $\frac{2}{3}$ of the cubes? How do you know?
 - How does your picture clearly show your thinking?

Assessment

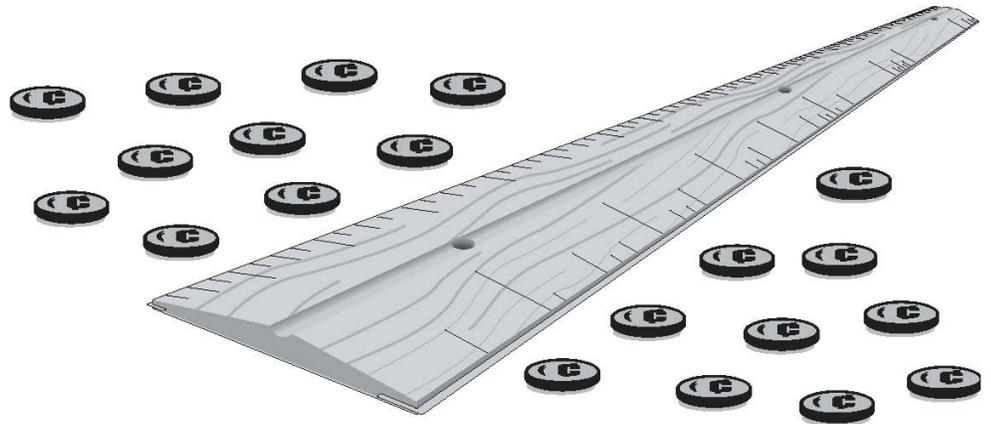
Observe students to assess how well they:

- Use manipulatives to show and explain a half, a third, and a quarter of a set;
- Estimate the quantity of objects in a set by using a half, a third, and a quarter of the set;
- Explain how they used fractions to estimate the quantity of objects in a set.

Home Connections

Provide students with a copy of the “Estimating in the Kitchen” Home Connections sheet. Explain the estimation activities to the students and encourage them to do the activities with someone at home.

"What's in the Bag?" Recording Sheet



Use your ruler to separate out a half, a quarter, and a third of the objects.
Count to find out how many objects are in a half, a quarter, and a third.
Use what you find to predict how many objects are in the bag altogether.

Half of the group is _____
I think there are _____ altogether.

A quarter of the group is _____
I think there are _____ altogether.

A third of the group is _____
I think there are _____ altogether.

Now count to find out how many objects there are altogether. _____
Which of your estimates was closest? Explain why you think it was closest.

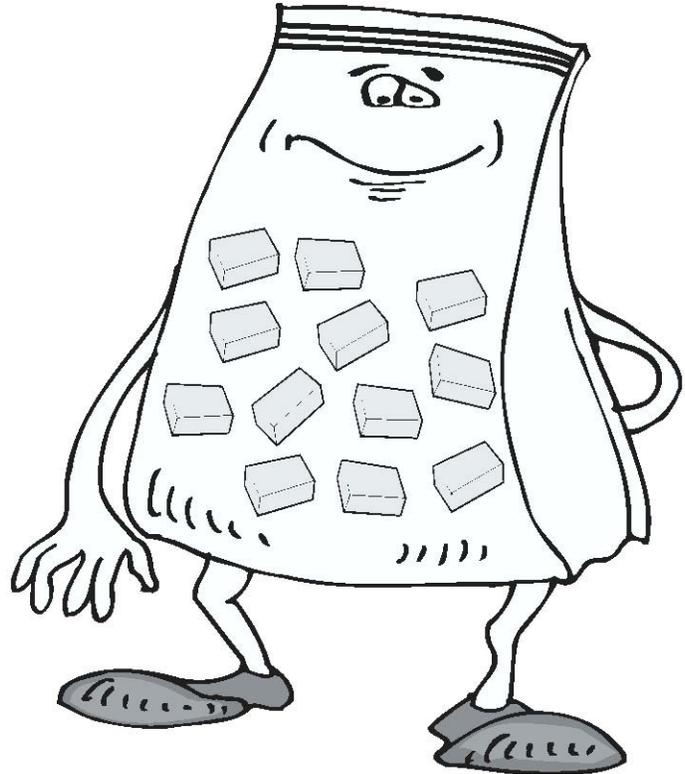
“Comparing with Fractions” Recording Sheet

There are 12 blocks in the baggie.

Which is more?

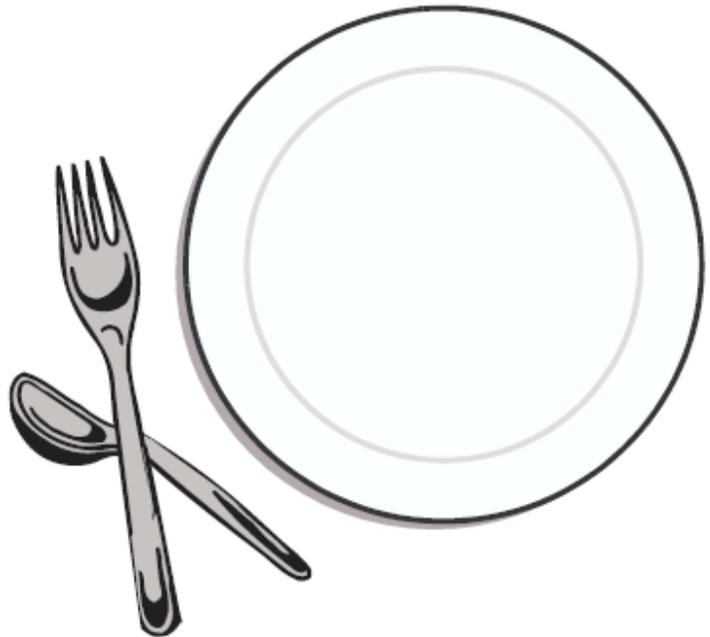
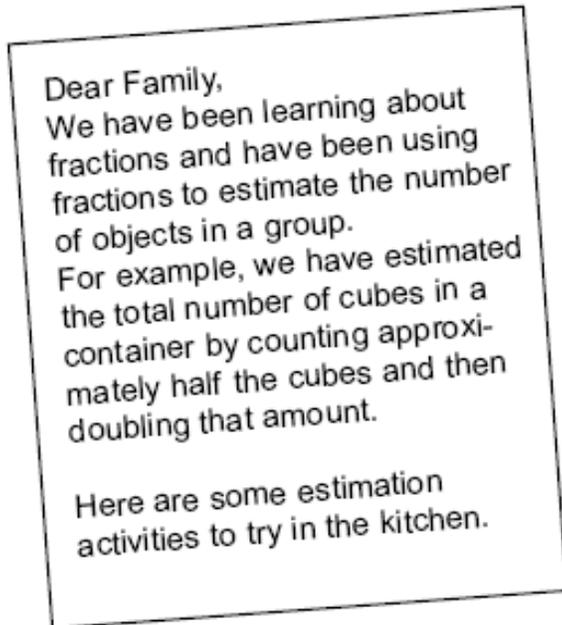
**One half of the blocks or
two thirds of the blocks?**

Show your thinking using pictures,
numbers, and/or words.



Home Connections – Grades 2 and 3 Activity Sheet

Estimating in the Kitchen



Estimate the number of forks in your kitchen.

Collect all the forks in one pile and then, without doing any counting, divide the forks into roughly two equal groups.

Count the forks in just one of the groups. Now complete the following sentences:

In one group of approximately half the forks, we counted _____ forks.

We estimate that there are _____ forks altogether.

Now count all the forks. How close was your estimate?

Estimate the number of spoons in your kitchen.

Collect all the spoons in one pile and then, without doing any counting, divide the spoons into roughly three equal groups.

Count the spoons in just one of the groups. Now complete the following sentences:

In a group containing approximately a third of the spoons, we counted _____ spoons.

We estimate that there are _____ spoons altogether.

Now count all the spoons. How close was your estimate?

Estimate the number of other items in your kitchen (mugs, bowls, saucers) by counting approximately a half, a third, or a quarter of these items.