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| **Grade 4 Module 2: Unit Conversions and Problem Solving with Metric Measurement** | | | | |
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Grade 4 Module 2

**Lesson 1**

Fluency Practice (10 minutes)

⬛ Convert Units 4.8A, 4.8B (2 minutes)

⬛ Meter and Centimeter Number Bonds 4.8A, 4.8B (8 minutes)

**Convert Units (2 minutes)**

Note: Isolated review builds fluency with conversion so that students can use this skill as a tool for solving

word problems.

T: (Write 100 cm = \_\_\_\_ m.) 100 centimeters is the same as how many meters?

S: 1 meter.

Repeat the process with the following possible sequence:

200 cm, 300 cm, 800 cm, and 500 cm.

T: (Write 1 m = \_\_\_\_ cm.) How many centimeters are in 1 meter?

S: 100 centimeters.

Repeat the process with the following possible sequence: 2 m, 3 m, 7 m, 4 m, and 9 m.

**Meter and Centimeter Number Bonds (8 minutes)**

Materials: (S) Personal white board

Note: This fluency activity prepares students to add and subtract meters and centimeters later in the lesson.

T: (Project a number bond with 150 cm written as the whole and 1 m as one of the parts.) How many

centimeters are in 1 meter?

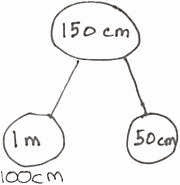
S: 100 centimeters.

T: (Beneath 1 m, write 100 cm.) On your personal white boards, write a

number bond filling in the unknown part.

S: (Write a number bond with a whole of 150 cm and parts of 1 m and 50 cm.)

Repeat the process with wholes of 180 cm, 120 cm, 125 cm, 105 cm, and 107 cm.

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T: (Project a number bond with 2 m written as the whole, 1 m as one of

the parts, and \_\_\_\_ cm as the other part.) Fill in the unknown part.

S: (Write a number bond with 2 m as the whole, 1 m as one of the

parts, and 100 cm as the other part.)

T: Show a number bond with a whole of 3 meters and pull out 100

centimeters. Name the other part in meters.

S: (Draw a number bond with 3 m as the whole, 100 cm as one of the

parts, and 2 m as the other part.)

Repeat the process with the following possible sequence: 5 meters, 8 meters, 9 meters, and 10 meters.

**Lesson 2**

Fluency Practice (12 minutes)

⬛ Convert Units 4.8A (4 minutes)

⬛ Unit Counting 4.8B (4 minutes)

⬛ Add and Subtract Meters and Centimeters 4.8C (4 minutes)

**Convert Units (4 minutes)**

Materials: (S) Personal white board

Note: Isolated review builds fluency with conversion so that

students can use this skill as a tool for solving word problems.

T: (Write 1 m = \_\_\_ cm.) 1 meter is how many

centimeters?

S: 100 centimeters.

Repeat the process with the following possible sequence: 2 m,

3 m, 9 m, and 6 m.

T: (Write 1,000 g = \_\_\_\_ kg.) 1,000 grams is the same as

how many kilograms?

S: 1 kilogram.

Repeat the process with the following possible sequence:

2,000 g; 3,000 g; 7,000 g; and 5,000 g.

T: (Project a number bond with 2 kg written as the whole, 1 kg as one of the parts, and \_\_\_\_ g as the

other part.) Fill in the unknown part.

S: (Write a number bond with 2 kg as the whole, 1 kg as one of the parts, and 1,000 g as the other

part.)

T: Write the whole as an addition sentence with mixed units.

S: (Write 1 kg + 1,000 g = 1 kg + 1 kg = 2 kg.)

Repeat the process with the following possible sequence: 3 kg = 2 kg + 1,000 g and 5 kg = 4 kg + 1,000 g.

**Unit Counting (4 minutes)**

Note: This fluency activity deepens student understanding of the composition and decomposition of unit

conversions, laying a foundation for adding and subtracting meters and centimeters. The numbers in bold

type indicate the point at which the direction of the counting changes.

Direct students to count by 50 cm in the following sequence, letting them know with gestures when to

change direction in counting:

⬛ 50 cm, 100 cm, 150 cm, 200 cm, 250 cm, 300 cm, 250 cm, 200 cm, 150 cm, 100 cm, 50 cm.

⬛ 50 cm, 1 m, 150 cm, 2 m, 250 cm, 3 m, 250 cm, 2 m, 150 cm, 1 m, 50 cm.

⬛ 50 cm, 1 m, 1 m 50 cm, 2 m, 2 m 50 cm, 3 m, 2 m 50 cm, 2 m, 1 m 50 cm, 1 m, 50 cm.

**Add and Subtract Meters and Centimeters (4 minutes)**

Materials: (S) Personal white board

Note: Reviewing this concept from Lesson 1 helps students work towards mastery of adding and subtracting

meters and centimeters.

T: (Write 540 cm + 320 cm = \_\_\_\_.) Say 540 centimeters in meters and centimeters.

S: 5 meters 40 centimeters.

T: (Write 5 m 40 cm below 540 cm.) Say 320 centimeters in meters and centimeters.

S: 3 meters 20 centimeters.

T: (Write 3 m 20 cm below 320 cm.) Add the meters.

S: 5 meters + 3 meters = 8 meters.

T: (Write 5 m 40 cm + 3 m 20 cm = \_\_\_\_.) Add the centimeters.

S: 40 centimeters + 20 centimeters = 60 centimeters.

T: (Write 8 m 60 cm as the sum on the line.) Say the addition sentence in centimeters.

S: 540 centimeters + 320 centimeters = 860 centimeters.

T: (Write 420 cm + 350 cm = \_\_\_\_.) On your personal white board, write 420 cm + 350 cm by

representing each number of centimeters as meters and centimeters, and then combining meters

and centimeters.

S: (Write 4 m 20 cm + 3 m 50 cm = 7 m 70 cm.)

Repeat the process with the following possible sequence: 650 cm − 140 cm and 780 cm − 210 cm.

**Lesson 3**

Fluency Practice (12 minutes)

⬛ Convert Units 4.8A (3 minutes)

⬛ Unit Counting 4.8B (5 minutes)

⬛ Add and Subtract Meters and Centimeters 4.8C (4 minutes)

**Convert Units (3 minutes)**

Materials: (S) Personal white board

Note: Isolated review builds fluency with conversion so that students can use this skill as a tool for solving word problems.

T: (Write 1 m = \_\_\_ cm.) 1 meter is how many centimeters?

S: 100 centimeters.

Repeat the process with the following possible sequence: 2 m, 4 m, 4 m 50 cm, 8 m 50 cm, 8 m 5 cm, and6 m 35 cm.

T: (Write 1,000 m = \_\_\_ km.) 1,000 meters is the same as how many kilometers?

S: 1 kilometer.

Repeat the process with the following possible sequence: 2,000 m, 3,000 m, 6,000 m, and 9,000 m.

T: (Project a number bond with 2 kilometers written as the whole, 1 kilometer as one of the parts, and

\_\_\_\_ m as the other part.) Fill in the unknown part.

S: (Write a number bond with 2 kilometers as the whole, 1 kilometer as one of the parts, and 1,000 m

as the other part.)

T: Write the whole as an addition sentence with mixed units.

S: (Write 1 km + 1,000 m = 2 km.)

Repeat the process with the following possible sequence: 2 km + 1,000 m = 3 km and 1,000 m + 7 km = 8 km.

**Unit Counting (5 minutes)**

Note: This fluency activity deepens student understanding of the composition and decomposition of units, laying a foundation for adding and subtracting grams and kilograms. The numbers in bold type indicate the point at which the direction of the counting changes.

Direct students to count by grams in the following sequence, letting them know with gestures when to

change direction in counting:

⬛ 500 g, 1,000 g, 1,500 g, 2,000 g, 2,500 g, 3,000 g, 2,500 g, 2,000 g, 1,500 g, 1,000 g, 500 g

⬛ 500 g, 1 kg, 1,500 g, 2 kg, 2,500 g, 3 kg, 2,500 g, 2 kg, 1,500 g, 1 kg, 500 g

⬛ 500 g, 1 kg, 1 kg 500 g, 2 kg, 2 kg 500 g, 3 kg, 2 kg 500 g, 2 kg, 1 kg 500 g, 1 kg, 500 g

⬛ 200 g, 400 g, 600 g, 800 g, 1 kg, 1 kg 200 g, 1 kg 400 g, 1 kg 600 g, 1 kg 800 g, 2 kg

⬛ 600 g, 1,200 g, 1,800 g, 2,400 g, 3 kg, 2,400 g, 1,800 g, 1,200 g, 600 g

⬛ 600 g, 1 kg 200 g, 1 kg 800 g, 2 kg 400 g, 3 kg, 2 kg 400 g, 1 kg 800 g, 1 kg 200 g, 600 g

**Add and Subtract Meters and Centimeters (4 minutes)**

Materials: (S) Personal white board

Note: Reviewing this concept from Lesson 1 helps students work towards mastery of adding and subtracting meters and centimeters.

T: Write 560 cm + 230 cm = \_\_\_. Below it, write \_\_\_\_ m \_\_\_\_ cm + \_\_\_ m \_\_\_\_ cm = \_\_\_\_ m \_\_\_\_

cm on your personal white boards. Now, complete the two addition sentences.

S: (Write 560 cm + 230 cm = 790 cm. Below it, write 5 m 60 cm + 2 m 30 cm = 7 m 90 cm.)

Repeat the process with the following possible sequence: 650 cm − 230 cm and 470 cm + 520 cm.

**Lesson 4**

Fluency Practice (12 minutes)

⬛ Perimeter and Area 4.5D (4 minutes)

⬛ Add Meters and Centimeters 4.8C (2 minutes)

⬛ Convert Units 4.8B (2 minutes)

⬛ Unit Counting 4.8B (4 minutes)

**Perimeter and Area (4 minutes)**

Note: This fluency activity prepares students for G4–M3–Lesson 1’s Concept Development.

T: (Project grid paper with a rectangle of 5 units by 3 units shaded.) What’s the length of the longest

side?

S: 5 units.

T: (Write 5 units. Point to the opposite side.) What’s the length of the opposite side?

S: 5 units.

T: (Write 5 units. ) What’s the sum of the rectangle’s two longest sides?

S: 10 units.

T: What’s the length of the shortest side?

S: 3 units.

T: (Write 3 units. Point to the unknown side.) What’s the length of the unknown side?

S: 3 units.

T: (Write 3 units. ) What’s the sum of the rectangle’s two shortest sides?

S: 6 units.

T: What is the sum of the four sides of the rectangle?

S: 16 units.

T: How many square units are in one row?

S: 5 square units.

T: How many rows of 5 square units are there?

S: 3 rows.

T: Let’s find how many square units there are in the rectangle, counting by fives.

S: 5, 10, 15.

T: How many square units in all?

S: 15 square units.

Repeat the process for 4 x 3 and 6 x 4 rectangles.

**Add Meters and Centimeters (2 minutes)**

Materials: (S) Add Meters and Centimeters Pattern Sheet

Note: This work with mixed units of meters and centimeters supports students in understanding mixed units of all kinds: liters and milliliters, kilometers and meters, kilograms and grams, and whole numbers and fractional units.

T: (Distribute Add Meters and Centimeters Pattern Sheet.) Do as many problems as you can in two

minutes. If you finish early, skip-count by 400 milliliters on the back. Stop when you get to

4,000 milliliters. Then, go back through each multiple, and convert multiples of 1,000 milliliters to

whole liters.

**Convert Units (2 minutes)**

Materials: (S) Personal white board

Note: Isolated review builds fluency with conversion so that students can use this skill as a tool for solving word problems.

T: (Write 1 m 20 cm = \_\_\_\_ cm.) 1 m 20 cm is how many centimeters?

S: 120 centimeters.

Repeat the process for the following possible sequence: 1 m 80 cm, 1 m 8 cm, and 2m 4 cm.

T: (Write 1,500 g = \_\_\_ kg \_\_\_ g.) On your personal white boards, fill in the equation.

S: (Write 1,500 g = 1 kg 500 g.)

Repeat the process for the following possible sequence: 1,300 g; 1,030 g; and 1,005 g.

T: (Write 1 liter 700 mL = \_\_\_ mL.) On your boards, fill in the equation.

S: (Write 1 liter 700 mL = 1,700 mL.)

Repeat the process for the following possible sequence: 1 liter 70 mL; 1 liter 7 mL; and 1 liter 80 mL.

**Unit Counting (4 minutes)**

Note: This fluency activity deepens student understanding of the composition and decomposition of unit

conversions, laying a foundation for adding and subtracting liters and milliliters. The numbers in bold type indicate the point at which the direction of the counting changes.

Direct students to count by liters in the following sequence:

⬛ 500 mL, 1,000 mL, 1,500 mL, 2,000 mL, 2,500 mL, 3,000 mL, 2,500 mL, 2,000 mL, 1,500 mL, 1,000 mL,

500 mL

⬛ 500 mL, 1 liter, 1,500 mL, 2 liters, 2,500 mL, 3 liters, 2,500 mL, 2 liters, 1,500 mL, 1 liter, 500 mL

⬛ 500 mL, 1 liter, 1 liter 500 mL, 2 liters, 2 liters 500 mL, 3 liters, 2 liters 500 mL, 2 liters, 1 liter 500 mL,

1 liter, 500 mL

⬛ 200 mL, 400 mL, 600 mL, 800 mL, 1 liter, 1 liter 200 mL, 1 Iiter 400 mL, 1 liter 600 mL, 1 liter 800 mL,

2 liters

⬛ 400 mL, 800 mL, 1,200 mL, 1,600 mL, 2,000 mL, 1,600 mL, 1,200 mL, 800 mL,400 mL

⬛ 400 mL, 800 mL, 1 liter 200 mL, 1 liter 600 mL, 2 liters, 1 liter 600 mL, 1 liter 200 mL, 800 mL, 400 mL

**Lesson 5**

Fluency Practice (12 minutes)

⬛ Sprint: Convert to Kilograms and Grams 4.8A, 4.8B (8 minutes)

⬛ Convert Units 4.8A, 4.8B (2 minutes)

⬛ Unit Counting 4.8A, 4.8B (2 minutes)

**Sprint: Convert to Kilograms and Grams (8 minutes)**

Materials: (S) Convert to Kilograms and Grams Sprint

Note: This Sprint helps students automatize their gram and

kilogram conversions when applying them in word problems.

**Convert Units (2 minutes)**

Materials: (S) Personal white board

Note: Isolated review builds fluency with conversion so that

students can use this skill as a tool for solving word problems.

T: (Write 1 L 400 mL = \_\_\_ mL.) Fill in the equation.

S: (Write 1 L 400 mL = 1,400 mL.)

Repeat the process for 1 L 40 mL, 1 L 4 mL, and 1 L 90 mL.

**Unit Counting (2 minutes)**

Note: This fluency activity deepens student understanding of the composition and decomposition of unit

conversions and works toward their mastery of adding and subtracting meters and centimeters. The

numbers in bold type indicate the point at which the direction of the counting changes.

Direct students to count by centimeters using the following sequence:

⬛ 800 cm, 1,600 cm, 2,400 cm, 3,200 cm, 4,000 cm, 3,200 cm, 2,400 cm, 1,600 cm, 800 cm

⬛ 800 cm, 1,600 cm, 2,400 cm, 3,200 cm, 40 m, 3,200 cm, 2,400 cm, 1,600 cm, 800 cm