

Convert Metric Units of Mass

Lesson 5

ESSENTIAL QUESTION ?

How can I use measurement conversions to solve real-world problems?

Mass is a measure of the amount of matter an object has.



Math in My World

Example 1

A white-tailed deer has a mass of 62 kg.
 What is the mass of the deer in grams?

Convert 62 kg to grams.

Since $1 \text{ kg} = 1,000 \text{ g}$, multiply 62 by 1,000.

So, $62 \text{ kg} = \underline{62,000} \text{ g}$.

The mass of the white-tailed deer is 62,000 g.

Check Use division to check your answer.

$$\underline{62,000} \div 1,000 = 62$$



$$\begin{array}{r} 1,000 \\ \times \quad 62 \\ \hline 62,000 \end{array}$$

Example 2

Convert 1,500 g to kilograms.

Since you are converting a smaller unit to a larger unit, divide.

$$\begin{array}{r}
 \overline{) 1,500} \\
 \underline{1,000} \\
 500 \\
 \hline
 \overline{) 1,500} \quad \text{1 R } \boxed{5} \boxed{0} \boxed{0} \\
 \underline{1,000} \\
 500
 \end{array}$$

The remainder 500 means there are 500 g left over.

The decimal part of a kilogram is 0.5.

So, 1,500 g = 1 kg 500 g or 1.5 kg.

Guided Practice

Complete.

1. $5,000 \text{ mg} = \square \text{ g}$

$$5,000 \div 1,000 = \underline{5}$$

So, 5,000 mg equals

$$\underline{5} \text{ g.}$$

2. $5 \text{ kg} = \square \text{ g}$

$$5 \times 1,000 = \underline{5,000}$$

So, 5 kg equals

$$\underline{5,000} \text{ g.}$$

3. $4,000 \text{ g} = \square \text{ kg}$

$$4,000 \div 1,000 = \underline{4}$$

So, 4,000 g equals

$$\underline{4} \text{ kg.}$$

4. $9 \text{ g} = \square \text{ mg}$

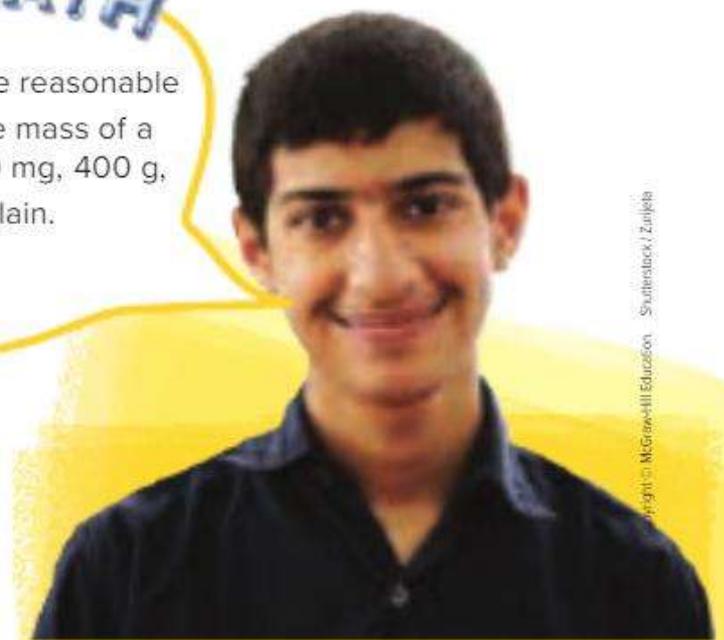
$$9 \times 1,000 = \underline{9,000}$$

So, 9 g equals

$$\underline{9,000} \text{ mg.}$$

Talk MATH

Which is a more reasonable estimate for the mass of a basketball: 400 mg, 400 g, or 400 kg? Explain.



Independent Practice

Complete.

$$5. 2,000 \text{ mg} = \underline{2} \text{ g}$$

$$2\,000 \div 1\,000$$

$$6. 80 \text{ g} = \underline{80,000} \text{ mg}$$

$$80 \times 1\,000$$

$$7. 0.75 \text{ kg} = \underline{750,000} \text{ mg}$$

$$0.75 \times 1\,000\,000$$

$$8. 6 \text{ kg} = \underline{6,000} \text{ g}$$

$$6 \times 1\,000$$

$$9. 3,100 \text{ g} = \underline{3.1} \text{ kg}$$

$$3\,100 \div 1\,000$$

$$10. 0.05 \text{ kg} = \underline{50,000} \text{ mg}$$

$$0.05 \times 1\,000\,000$$

$$11. 4.07 \text{ g} = \underline{4,070} \text{ mg}$$

$$4.07 \times 1\,000$$

$$12. 9 \text{ kg} = \underline{9,000} \text{ g}$$

$$9 \times 1\,000$$

Independent Practice

Compare. Use $<$, $>$, or $=$ to make a true statement.

13. 2,300 mg $>$ 2 g

2 300 mg $>$ 2 000 mg

14. 3 kg $=$ 3,000 g

3 kg = 3 kg

15. 4.5 kg $>$ 4,050 g

4.5 kg $>$ 4.05 kg

16. 4,120 mg $=$ 4.12 g

4 120mg = 4 120mg

17. 75 g $>$ 800 mg

75 g $>$ 0.8 g

18. 814 g $<$ 8.14 kg

0.814 kg $<$ 8.14 kg



Sample answers: 20, 23

Problem Solving

Use the table shown for Exercises 19–21.

Macaws	
Species	Mass (grams)
Blue and Gold	800
Green-winged	900
Red-footed	525
Yellow-collared	250

19. How many yellow-collared macaws would have a combined mass of 1 kg?

4 yellow-collared macaws

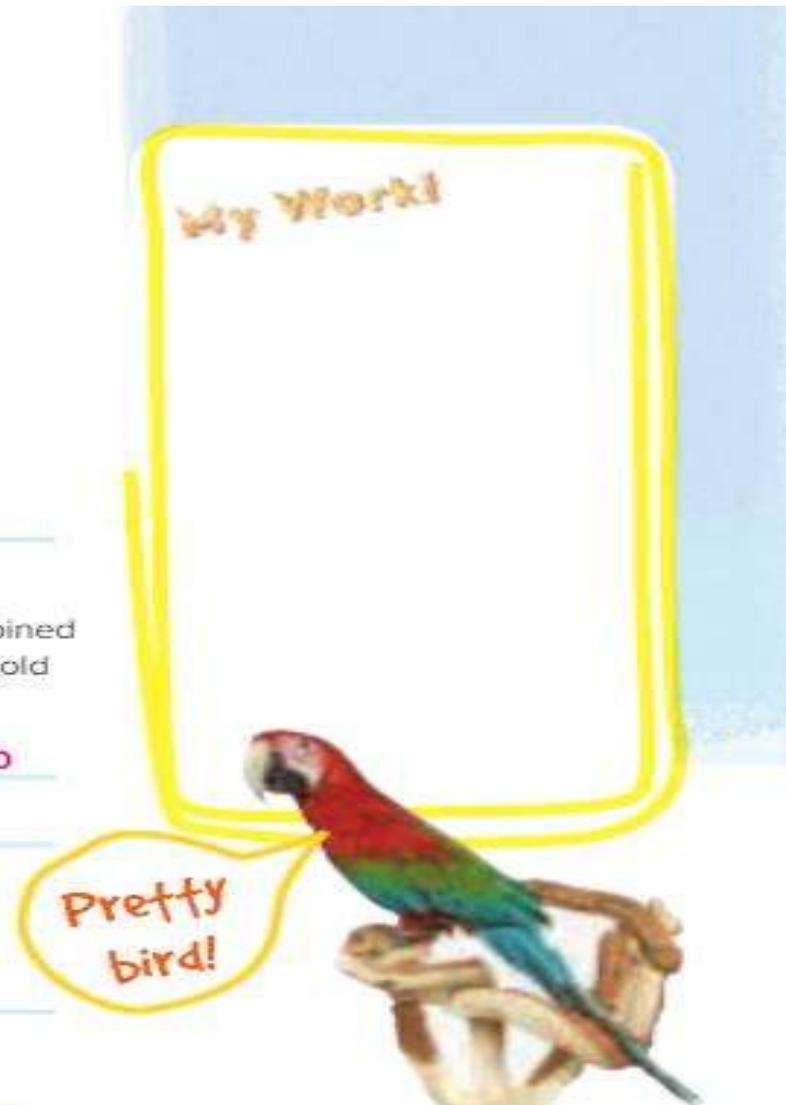
20. **Mathematical Practices 6** **Explain to a Friend** Is the combined mass of two red-footed macaws and three blue and gold macaws closer to 3 kg or 4 kg? Explain.

3 kg; the total mass is 3,450 g which rounds to

3,000 g or 3 kg

21. Which macaw has a mass closest to 1 kg?

Green-winged





Problem Solving

NOT Problems**Mathematical**

22. **Practices** Use Number Sense One pound is approximately equal to 0.5 kg. About how many kilograms is 3 pounds?

about 1.5 kg

23. **?** **Building on the Essential Question** How is converting metric units of mass different from converting customary units of weight?

With metric units, converting is easier since I am multiplying and dividing by powers of 10.

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Units of Mass

Homework Helper

Mr. Mansour bakes muffins that have a mass of about 50,000 mg. What is the mass in grams?

Convert 50,000 mg to grams.

Since 1,000 mg = 1 g, divide 50,000 by 1,000.

So, 50,000 mg = 50 g.

The muffins have a mass of about 50 g.

Practice

Complete.

1. 7,000 mg = 7 g

2. 4.7 kg = 4,700 g

3. 18,500 g = 18.5 kg

4. 8.3 kg = 8,300 g

5. 22 g = 22,000 mg

6. 135,000 mg = 0.135 kg

**Problem Solving**

7. One highlighter has a mass of 11 g. Another highlighter has a mass of 10,800 mg. Which highlighter has the greater mass?

11 g highlighter

8. **Mathematical Practices**  **Be Precise** One computer has a mass of 0.8 kg and another has a mass of 800 g. Compare the masses of the computers. Use $>$, $<$, or $=$ to make a true statement.

$0.8 \text{ kg} = 800 \text{ g}$

**Problem Solving****Vocabulary Check**

Fill in the correct circle that corresponds to the best answer.

9. Which of the following is not a common unit of measurement for the metric system?
- (A) milligram (C) gram
 (B) kilogram (D) ounce
10. Which operation is necessary to convert a larger unit to a smaller unit?
- (A) addition (C) multiplication
 (B) subtraction (D) division

Test Practice

11. For a science experiment, Huda measured a piece of metal that has a mass of 3,500 g. What is the mass of the metal in kilograms?
- (A) 0.35 kg (C) 35 kg
 (B) 3.5 kg (D) 350 kg