



Hands On

Estimate and Measure Metric Mass

Lesson 4

ESSENTIAL QUESTION ?

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

The **mass** of an object is the amount of matter it has.
A **gram** is a metric unit of measurement of mass.



Measure It



Estimate the mass of each object in grams. Record your results in the table.

Sample answers given.

Object	Mass (g)	
	Estimate	Actual
Scissors	50	45
Pencil	15	20
Stapler	200	250
Calculator	100	120



Measure the mass of each object.

Place the scissors on one side of a balance. Set gram weights on the other side until the sides are level. Record the actual mass. Repeat this step for the other objects.





Try It

A **kilogram** is also a metric unit of measurement of mass. One kilogram is equal to 1,000 g. Use this to complete the table below.

Kilograms	Grams
1	1,000
2	2,000
3	3,000
4	4,000
5	5,000

Look for a pattern in the table.

How many grams are in 6 kg? 6,000

How many grams are in 9 kg? 9,000



Talk About It



1. Order the four objects you weighed in the first activity from greatest to least mass.

See students' work.

2. **Mathematical Practices**  **Explain to a Friend** Use the mass of the objects you found to estimate the mass of two other objects in your classroom. Then find the mass of the objects. Were your estimates close?

See students' work.

3. Could a larger object have less mass than a smaller object? Explain.

The larger object could have less mass than the smaller object because of the material used to make the object.

4. Explain how you can use mental math in order to convert kilograms to grams.

Since there are 1,000 g in 1 kg, I know that I will have to move the decimal three places to the right.



Practice It

5. Identify three objects in your classroom that you can use the balance to find their masses. Estimate each object's mass. Then find the mass of each object and record the exact mass in the table.

See students' work.

Object	Mass (g)	
	Estimate	Actual



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

6. 1,500 g $>$ 1 kg

1.5 kg $>$ 1 kg

7. 3,000 g $=$ 3 kg

3 kg $=$ 3 kg

8. 4,000 g $>$ 3 kg

4 kg $>$ 3 kg

9. 3,700 g $<$ 4 kg

3.7 kg $<$ 4 kg



10. 5 kg $<$ 6,000 g

5 kg $<$ 6 kg

11. 3.5 kg $>$ 3,000 g

3.5 kg $>$ 3 kg

12. 2.5 kg $=$ 2,500 g

2.5 kg $=$ 2.5 kg

13. 3.25 kg $<$ 3,300 g

3.25 kg $<$ 3.3 kg



Apply It

14. Ahmed and Ali measured the mass of the same chinchilla. Ahmed measured the chinchilla as 1 kg. Ali measured the chinchilla as 945 g. Circle the more precise measurement.

945 g

1 kg

15. Hessa measured the mass of her books. She measured the mass as 2 kg. Her second measurement was 2,050 g. Use $>$, $<$, or $=$ to make a true statement.

2 kg $<$ 2,050 g

16. **Mathematical Practices** **Be Precise** If you are measuring the mass of a container of salt, would grams or kilograms give you a more precise measurement? Explain.

grams; Since grams are

lighter than kilograms, you would get

closer to the exact mass using grams.

Mathematical Practices



17. **Practices** **Draw a Conclusion** Compare and contrast grams and kilograms.

A gram is a smaller unit of

measure than one kilogram. Grams are used to

measure objects of smaller mass.



Write About It

18. How can I convert grams to kilograms without measuring?

To convert grams to kilograms, divide by 1,000.



MY Homework

Lesson 4

Hands On-Estimate
and Measure
Metric Mass

Homework Helper

One kilogram is equal to 1,000 g. Use this information to complete the table. How many grams are in 6 kg?

For every increase of one kilogram,
increase the number of grams
by 1,000.

Kilograms	Grams	
1	1,000	1 = 1,000
2	2,000	2 = 2,000
3	3,000	3 = 3,000
4	4,000	4 = 4,000
5	5,000	5 = 5,000
6	6,000	6 = 6,000

So, 6 kg are equal to 6,000 g.



Practice

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

1. 2,300 g $>$ 2 kg

2. 4,840 g $<$ 5 kg

3. 4 kg $<$ 4,150 g

4. 1.75 kg $=$ 1,750 g

Vocabulary Check

5. Fill in the blank with the correct word to complete the sentence below.

The mass of an object is the amount of matter it has.



Problem Solving

6. Tarek and Ali measured the masses of their cell phones. Tarek measured his cell phone using kilograms. Ali measured his cell phone using grams. Which measure would be more appropriate to measure a cell phone?

grams

Mathematical



7. **Practices** **Be Precise** Fahd has a ten-year-old cat, Shadow. Is Shadow's mass more likely to be 6 kg or 6 g? Explain.

6 kg; 6 g would be too little for

the mass of a cat.



8. Nasser measured the mass of his luggage. His luggage's mass was 21,530 g. The airline will only allow luggage that has a mass under 23 kg. Will Nasser be allowed to fly with his luggage? Explain.

yes; $21,530 \text{ g} < 23 \text{ kg}$

9. Hala measured the mass of her new kitten. Her first measurement was 2,350 g. Her second measurement was 2.3 kg. Circle the measurement that is more precise.

2,350 g

2.3 kg

10. Yousif measured the mass of his iguana. His first measurement was 4,100 g. His second measurement was 4 kg. Compare the two measurements. Use $>$, $<$, or $=$ to make a true statement.

$4,100 \text{ g} > 4 \text{ kg}$