

WEIGHT (OPERATIONS INVOLVING WEIGHTS)

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Subject

Mathematics

Prepared By

[Instructor Name]

Grade Level

3

Overview

This lesson plan covers teaching content for;

1. Changing weights from Kilogram to gram
2. Converting weights from gram to kilogram
3. Adding and subtracting weights in grams and kilograms
4. Multiplying and dividing weights in grams and kilograms.
5. Solving word problem questions on weights.

Objectives

Students should be able to;

1. Change from one unit of weight to another
2. Add and subtract weight in kilograms and Grams
3. Solve problems on addition and subtraction of weights.
4. Multiply and divide weight by whole numbers
5. Solve problems on multiplication and division of weight

Activity Starter/Instruction

1. Explain to the class that a gram is a metric unit of measurement that you can use to measure the mass, or weight, of an object.
2. List some things that are usually measured in grams. Great examples are baking ingredients like sugar and flour.
3. Ask students to share any times they've noticed the weight of an object recorded in grams.
4. Break down definition of some keywords for the students. E.g.

weigh: put on a scale to measure the heaviness of something

mass: weight or heaviness

kilogram: the base unit used for measuring mass

gram: one 1 000th of a kg i.e. what you get when you divide 1Kg into 1000 parts.

Teacher Guide

Day 1/ Lesson 1: 15 Mins

1. Collect a variety of items on which the mass is clearly indicated.
2. Ask your pupils to order the items from the lightest to the heaviest, and vice versa.
3. Ask pupils to classify the items into two groups namely heavy and light.
4. Items that do not fit into either of the categories could be the source of interesting discussion.
5. Allow pupils to handle the different items as much as possible to build their concept of mass.

Materials Required

- White Board
- Blank sheets
- Weighing or balance scale
- Meter stick or tape rule
- Pencils
- Objects to weigh, e.g., bags sand or stones

Additional Resources

- <https://za.pearson.com/content/dam/region-growth/africa/TeacherResourceMaterial/New%20General%20Curriculum%20Framework%20for%20Mathematics%20Grades%201-7.pdf>
- <https://www.education.com/lesson-plan/gram-i-am/>
- <https://www.onlinemathlearning.com/adding-weights.html>
- <https://www.math-only-math.com/addition-of-mass.html>

Additional Notes

Teacher Guide

Day 2/ Lesson 2: 15 Mins

Guided Practice

Day 3/ Lesson 3: 20 Mins

Guided Practice

1. We will learn how to add the different units of mass or weight together.

2. We will learn two different methods to solve addition and subtraction using the standard unit and smaller unit of mass. Students can practice both the methods.

(i) Adding units with conversion into gram

(ii) Adding units without conversion into gram

3. **Method 1 (with conversion into gram):**

4. We know, **1 kg = 1000 grams**

5. Now kg and g are converted into grams before doing addition and then we need to follow the simple addition process.

6. For example: Add 7 kg 350 g and 2 kg 150g together.

solution

$$7 \text{ kg } 350 \text{ g} = (7 \times 1000) \text{ g} + 350 \text{ g} = 7000 \text{ g} + 350 \text{ g} = 7350 \text{ grams}$$

$$2 \text{ kg } 150 \text{ g} = (2 \times 1000) \text{ g} + 150 \text{ g} = 2000 \text{ g} + 150 \text{ g} = 2150 \text{ grams}$$

Now sum,

1

Method 2 (without conversion into gram):

1. Here kg and g are arranged in different columns and then added like ordinary numbers.

$$\begin{array}{r} \text{kg} \quad \text{g} \\ 1 \quad 11 \\ 8 \quad 575 \\ + 4 \quad 897 \\ \hline 13 \quad 472 \\ = 13 \text{ kg } 472 \text{ g} \end{array}$$

2. Therefore, sum of 8 kg 575 g and 4 kg 897 g = 13 kg 472 g

3. Let us add 17 kg, 13 kg 940 g and 15 kg 65 g

Solution:

4. Here kg and g are arranged in different columns and then added like ordinary numbers (without conversion into gram).

$$\begin{array}{r} \text{kg} \quad \text{g} \\ 11 \quad 1 \\ 17 \quad 000 \\ 13 \quad 940 \\ + 15 \quad 065 \\ \hline 46 \quad 005 \\ = 46 \text{ kg } 005 \text{ g} \end{array}$$

5. Therefore, sum of 17 kg, 13 kg 940 g and 15 kg 65 g = 46 kg 005 g

6. The above problems on addition of mass will help the students to practice adding the different units with conversion or without conversion.

7. Pupils may make mistakes when adding or subtracting mass with mixed units of kilograms and grams. This is often due to the pupils misreading the questions.

8. For example, if pupils add 150 kg and 150g. The second mass in the addition does not have both kg and g, pupils should be alerted to the fact that the second mass is 150kg,

Day 4/ Lesson 4: 30 Mins

1. The teacher should revise the basic concepts of multiplication and division with the students.

2. Explain to the students that multiplying and dividing units of weight the same as working with decimal numbers.

3. Units of weight can be written as decimal numbers, for example,

$$5 \text{ g} = 0.005 \text{ kg.}$$

$$5 \text{ g} \times 10 = 50 \text{ g} = 0.05 \text{ kg and}$$

$$0.005 \text{ kg} \times 10 = 0.05 \text{ kg.}$$

4. Use mental calculation activities to refresh your pupils' memory and skill at number work.

5. Ask questions involving simple multiplication and division facts.

6. For example, Jack has 4 oranges weighing 30 grams each and 3 textbooks weighing 0.6kg each inside his bag. What is the total weight of the items in his bag?

$$1 \text{ orange} - 30 \text{ gram}$$

$$4 \text{ oranges} - 30 \text{ gram} \times 4 = 120 \text{ gram.}$$

$$\text{Also, } 1 \text{ textbook} - 0.6\text{kg}$$

$$\text{Convert from kg to grams}$$

$$0.6 \times 1000 = 600 \text{ gram}$$

$$3 \text{ textbooks} - 600\text{gram} \times 3 \\ = 1800 \text{ g}$$

$$\therefore \text{total weight} = 120 \text{ g} + 1800 \text{ g} = 1920 \text{ g}$$

7. Here we see the importance of knowing how to multiply weights in kilogram and grams.

8. Pupils should be able to divide weight by whole numbers correctly and solve problems on division of weight.

9. Pupils who have proved they understand the

$\begin{array}{r} 7350 \text{ g} \\ + 2150 \text{ g} \\ \hline 9500 \text{ g} \\ = 9 \text{ kg } 500 \text{ g} \end{array}$ <p>Therefore, $7 \text{ kg } 350 \text{ g} + 2 \text{ kg } 150 \text{ g} = 9 \text{ kg } 500 \text{ g}$</p>	<p>not 150g.</p>	<p>concepts can be put in groups to make up their own multiplication and division problems with weight for the group to do.</p>
<p>Assessment Activity</p>	<p>Assessment Activity</p> <p>Solve the following:</p> <p>1. $5.7 \text{ mg} + 6.5 \text{ mg} =$</p> <p>2. $6.2 \text{ kg} + 300 \text{ g} =$</p> <p>3. $3 \text{ g } 7 \text{ mg} + 4 \text{ g } 4 \text{ mg} =$</p> <p>4. $5 \text{ g } 6 \text{ mg} + 3 \text{ kg } 95 \text{ g} =$</p> <p>5. $3 \text{ kg } 60 \text{ g} + 8 \text{ kg } 70 \text{ g} =$</p> <p>6. $5 \text{ g } 7 \text{ mg} - 4 \text{ g } 4 \text{ mg} =$</p> <p>7. $5 \text{ kg } 6 \text{ g} - 3 \text{ kg } 95 \text{ g } 8 \text{ mg} =$</p> <p>8. $9 \text{ kg } 60 \text{ g} - 8 \text{ kg } 70 \text{ g} =$</p>	<p>Assessment Activity</p> <p>Solve the following</p> <p>1. $6.3 \text{ g} \times 3 =$</p> <p>2. $13 \text{ kg } 50 \text{ g} \times 4 =$</p> <p>3. $(12 \text{ kg } 335 \text{ g} + 2 \text{ kg } 790 \text{ g}) \times 6$</p> <p>All pupils must convert the following to grams and divide the result by 5:</p> <p>4. $5 \text{ kg } 100 \text{ g};$</p> <p>5. $6 \text{ kg } 100 \text{ g};$</p> <p>6. $7 \text{ kg } 5 \text{ g}$</p>
<p>Summary</p>	<p>Review and Closing</p> <ol style="list-style-type: none"> 1. Pupils should be able to arrange objects according to how heavy or light they are. 2. They should be able to decide whether an object would be best measured in grams or in kilograms. 3. Check pupils' estimates of the masses of different objects and check pupils' answers to the exercise questions. 4. Pupils should be able to multiply and divide 5. decimal numbers and understand how to apply this to working with grams and kilograms. 	