ADDITION AND SUBTRACTION OF LENGTHS

3.20.2019

Subject

Mathematics

Prepared By

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Grade Level

3

Overview

This lesson plan covers teaching content for;

1. Addition and Subtraction of lengths of the same unit
2. Addition and Subtraction of lengths of different units
3. Word problems and quantitative reasoning on lengths

Objectives

Students should be able to;

1. Add and subtract lengths in centimeters and meters
2. Add and subtract lengths in meters and Kilometers.
3. Solve given problems on addition and subtraction of lengths in different units.
4. Solve word problems on addition and subtraction of length.

Activity Starter/Instruction

1. Revise basic addition, subtraction, multiplication and division skills.
2. Set your pupils the questions below, and ask them to answer verbally or in written form.
3. Correct the answers and assess your pupils' competence with the four arithmetic operations.
4. You may wish to do an example of this on the board first.

   16 + 5; 230 + 50 + 20; 100 – 45;
   40 – 5 – 10; 4 × 8; 7 × 7; 40 ÷ 8;
   56 ÷ 7; 72 × 4; 35 × 6
5. There should also be a review of how to multiply and divide by powers of 10.
6. For example, to multiply 23 by 10, you can do 23 * 1 = 23 and add a zero for 230, or you can move the decimal one place to the right, 23.0 to 230.
7. Dividing is to move the decimal to the left by the number of zeroes in the power.

Teacher Guide

Day 1/ Lesson 1: 15 Mins

1. Work through the worked examples with your pupils so that they understand how to do the calculations
2. Point out that we can only add and subtract lengths that have the same unit. Therefore, if they are given two (or more) lengths in different units, the lengths must be converted to the same unit, then we can perform our operation on it.
3. Pupils must make sure that they do the calculations correctly. When adding or subtracting, it is important that they align the numbers correctly in the place value columns.
4. For example, to add the lengths 5m +20cm, we must first convert to a common unit.

   5m + 20cm

   Since 1m = 100cm,

   5m = 5 x 100cm = 500cm

Materials Required

- White Board
- Blank sheets
- Pencils
- Ruler
- Meter rule/Tape measure.
- Notebooks

Additional Resources

- http://www.kwiznet.com/p/takeQuiz.php?ChapterI
- https://www.engageny.org/sites/default/files/resou
  module.pdf
- https://za.pearson.com/content/dam/region-growth
  africa/TeacherResourceMaterial/9781447978411_n
- https://www.onlinemathlearning.com/metric-length

Additional Notes

Guided Practice

Day 2/ Lesson 2: 15 Mins

1. Mathematical operations are carried out in the same way as normal decimal number operations.
2. Note, that the quantities involved in the calculations are all expressed in the same units.
   Examples:
   19 cm + 23 m + 25.9 m
3. First convert everything to the same units:
   19 cm = 0.19 meters
   0.19 m + 23 m + 25.9 m = 49.09 m
4. Another way is to convert everything to centimeters and perform addition operation
   23 m = 1300 cm
   25.9 m = 1590 cm
   19 cm + 2 300 cm + 2 590 cm = 4 909 cm
5. Final answer is expressed in meters as: 49.09 m
6. A rope is 3 meters long. You cut 100 cm out of it. How many meters of the rope are remaining?
   1 meter = 100 cm
   Hence 3 m - 1m = 2m
   Answer: 2 m

Guided Practice

Day 3/ Lesson 3: 30 Mins

1. Pupils should be able to add and subtract lengths and write their answers with the relevant unit of measurement.
2. Write down three lengths on the board, for example 2 m, 5 m and 8 m. Your pupils should work in pairs.
3. Each pupil should individually devise a word problem that involves all three measurements, and write their word problem down.
4. They then swap their problem with their partner and solve one another's word problems.
5. Repeat this activity, but this time using a mixture of units, for example 60 cm, 1 m and 5 cm.
6. For example, three sticks measure 60 cm, 1 m and 5cm, if we join the sticks together, what will be total length of the new stick?
7. We have to convert the lengths to a common metric unit.
   Since, 100cm = 1m
   60 cm = 60/100m = 0.6m

∴ we have 0.6m + 1m + 5m = 6.6meter.

Now that we have the same units, we can add the numbers together,

∴ 5m +20cm = 500cm +20cm = 520cm.

Guided Practice

Day 4/ Lesson 4: 15 Mins

1. To solve a word problem question on metric units, we have to first determine the operation to perform (either addition or subtraction)
2. If the numbers in the word problem have different metric units, we must convert them to the same unit. Then we perform our operation on it.
3. For example, Jessica is measuring two line segments. The first line segment is 30 cm long, while the second is 500mm long. How long are two line segments together? Give your answer in cm.
4. To solve the question, we have to add the two numbers together, 30cm + 500mm = ___
5. The two segments are given in in different metric uinits, so they have to be converted to the same metric unit.

   30cm = 30 cm

   Since, 10mm = 1cm

   500mm = 500/10mm = 50cm

   Now we can add the two numbers together.

   30cm + 500cm = 30cm + 50cm = 80cm

Assessment Activity	Assessment Activity	Assessment Activity
	Solve. 1. 4 km - 280 m = 2. 1 m 15 cm - 34 cm = 3. Express your answer in the smaller of the two units: 1 km 431 m + 13 km 169 m = 4. Express your answer in the smaller of the two units: 231 m 31 cm - 14 m 48 cm = 5. 67 km 230 m + 11 km 879 m = 6. 67 km 230 m - 11 km 879 m =	John rode 2 kilometers on his bike, his sister, Susan rode 3000 meters on her bike. Who rode the farthest and how much farther did they ride? Give your answer in km.
Summary	Review and Closing	
	1. At the end of the lesson, the teacher could discuss some or all of the questions. 2. Mark the exercise, taking note of where individual pupils have not met the unit objectives, in order to give these pupils additional teaching input where required.	