



Makes Maths Fun

Level 4

MASS

Bloomsmath is a comprehensive mathematics program which provides a fun way for every student to be learning to the best of their ability.

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## Mass

Level 4 is designed for students in their fourth year at school often called Year 3. Students will estimate, measure, compare and record masses using kilograms and grams.

**Knowledge:** Students will read scales and record masses using kilograms and grams.



Students who demonstrate proficiency in this activity move on to Comprehension.



Students stop here as they require additional teacher support to master this activity.

**Comprehension:** Students will estimate and then measure the mass of a number of regular classroom objects.



Students who demonstrate proficiency in this activity move on to Application.



Students stop here if time has run out or they require additional support with this activity.

**Application:** Students will compare animals and their ability to carry various masses.



Students who demonstrate proficiency in this activity move on to Analysis.



Students stop here if time has run out or they require additional support with this activity.

**Analysis:** Students will calculate how much they can safely carry and what this looks like in the real world.



Students who demonstrate proficiency in this activity move on to Synthesis.



Students stop here if time has run out or they require additional support with this activity.

**Synthesis:** Students will compare weightlifting records to their body weight and what this looks like in the real world.

**Evaluation:** Suggested questions provide a starting point for discussions related to Mass.



Students may complete more or fewer activities for each learning outcome depending on the time allocated and their strength in the area being covered.

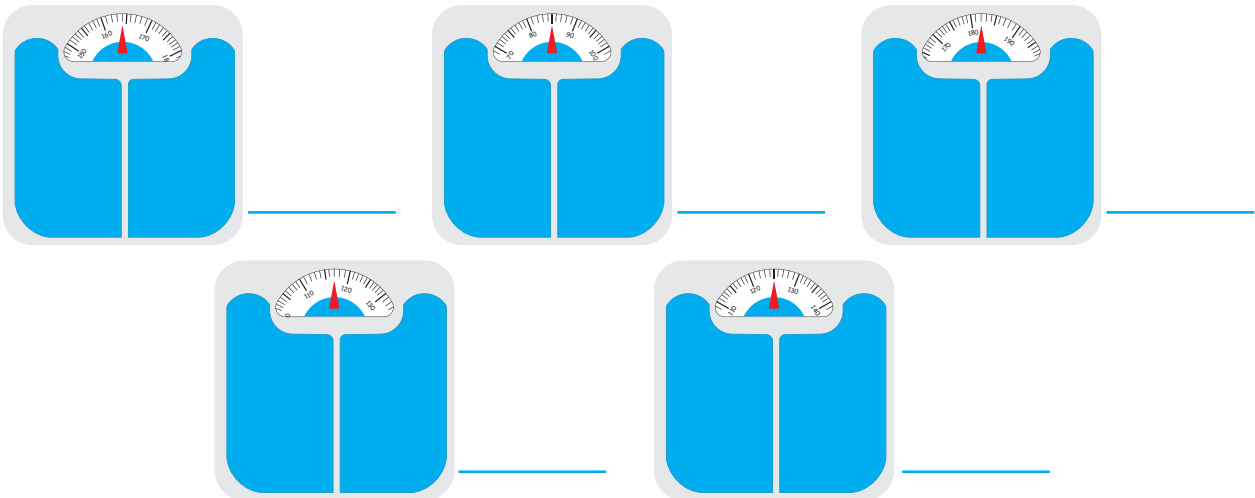
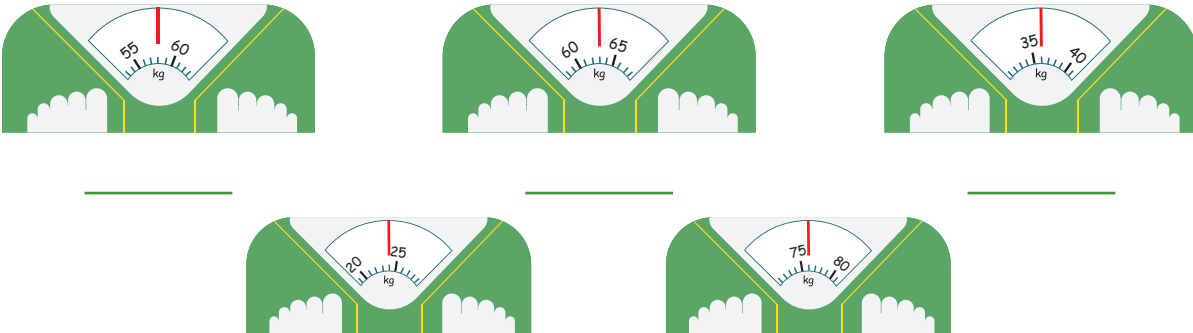
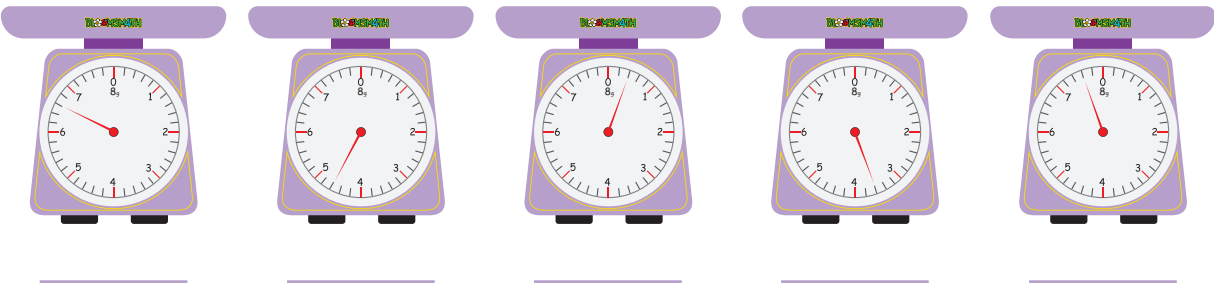


All students should participate in the Evaluation discussion to encourage the use of mathematical language, logical reasoning and reflection on that which they have completed.

Name: \_\_\_\_\_

# Knowledge

Read and write what is shown on each scale below.



Mass - Level 4 - Students will estimate, measure, compare and record various masses.

Knowledge

Comprehension

Application

Analysis

Synthesis

Evaluation



Let's Try This Again



Progress To Comprehension

Name: \_\_\_\_\_

# Comprehension

Estimate the weight of each of these items and then use a set of kitchen scales to weigh them and see how close you were in your estimation.

An Apple	bottle	cleaner
A Pen	A sandwich	A pencil sharpener
A litre of water	A packet of crisps	A novel book
An empty drink	A whiteboard	A school hat

Estimation:

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

Actual weight:

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

\_\_\_\_\_ g/kg

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\_\_\_\_\_ g/kg

Mass - Level 4 - Students will estimate, measure, compare and record various masses.

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Let's Try This Again



Progress To Application

Name: \_\_\_\_\_

# Application

Use the data below to order these animals from strongest to least strong.

Camels = their own body weight

Horse =  $\frac{1}{5}$  their body weight

Elephant = 1.5 times their body weight

Bear =  $\frac{4}{5}$  its body weight

Tiger = twice its body weight

Eagle = 4 x its body weight

Gorillas = 10 x its bodyweight

Ant = 50 times

Order:

Strongest  Least Strong

How much can each animal carry given its body weight below.

- Camel = 480kg
- Horse = 500kg
- Elephant = 6000kg
- Bear = 500kg
- Tiger = 200kg
- Eagle = 6kg
- Gorilla = 160kg
- Ant = 5mg

Which animal can actually carry the most weight?



Let's Try This Again



Progress To Analysis

Name: \_\_\_\_\_

# Analysis

It is recommended that humans should not carry more than 15% of their own body weight. Weigh yourself and then use a calculator to work out how much you should carry.

**Body weight** \_\_\_\_\_ **x 15% =** \_\_\_\_\_

*Ie. If you weigh 35kg you can carry  $35 \times 15\%$  which is 5.25KG.*

Work out how many of each of these items you can safely carry when helping unload groceries.

To do this use the calculator again:

**Carrying weight** \_\_\_\_\_ **÷ Items Weight** \_\_\_\_\_

*Ie. If you can carry 5.25KG you can carry  $5.25 \div 2$  (Milk) = 2 Litres of milk.*

- 2 Litre bottles of milk (2kg)
- Tins of Beans (400g)
- Loaves of bread (700g)
- Blocks of butter (250g)
- Bags of Flour (1kg)
- Apples (100g)

Work out how you could pack the least number of shopping bags to carry 1 x 2 Litres of milk, 3 tins of beans, 1 loaf of bread, 1 block of butter, 2 bags of flour and 6 apples. The beans, flour and apples can be split between various bags.

Mass - Level 4 - Students will estimate, measure, compare and record various masses.

Knowledge

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Evaluation

**BLOOMSMATH**



Let's Try This Again



Progress To Synthesis

Name: \_\_\_\_\_

# Synthesis

In the previous activity you learnt that it is safe to lift 15% of your own weight. Weightlifters train to be able to lift much more than this. Complete the table below to see how much each class of weightlifter can lift and what this means in real world terms.

Olympic Weight Lifting Class	Weight Lifted (kg)	Times Body Weight	Order the lifters from strongest to least strong.
Mens 56kg	140kg	<i>Weight Lifted ÷ Lifter's weight</i> $140 \div 45 = 2.5$ times	
Mens 62kg	167.40kg		
Mens 69kg	189.75kg		1 - Strongest
Mens 77kg	209.44 kg		
Mens 85kg	215.05 kg		
Mens 94kg	219.96 kg		
Mens 105kg	234.15 kg		
Womens 48kg	115.20 kg		
Womens 53kg	121.90 kg		
Womens 58kg	128.76 kg		
Womens 63kg	146.16 kg		
Womens 69kg	151.80 kg		
Womens 75kg	150 kg		13 - Least Strong

How many of each item could a man who can carry 140kg carry?

- Tins of Beans (400g)
- Loaves of bread (700g)
- Blocks of butter (250g)

Using the information from the application activity where does this put humans on the animal strength list?



Let's Try This Again



Progress To Evaluation

# Evaluation

The following questions and activities are provided as a starting point for fun discussions related to Mass. During these conversations students will have an opportunity to use appropriate mathematical language in its correct context, to engage in reflection on the Mass activities they have completed and to use logical reasoning to tie their in-class mathematics to its everyday context.



There is a theory by Wilson and Hoelldobler's that when combined, all ants in the world taken together weigh about as much as all human beings. This is based on the idea that the average human weighs a million times more than the average ant. Discuss this with your class and see if they agree with this theory.



If students were to lift  $2 \frac{1}{2}$  times their weight what items would they now be able to lift? Could they lift a car? Could they lift a fridge? Could they lift their parents?



How do weightlifters manage to lift so much weight?



How long can weightlifters hold the weight they lift?



How different does it feel to hold 1kg in a carry bag, on your shoulder, in a backpack, out in front of you. Which feels the lightest? Which can you hold for the least/longest amount of time?

