



Rubbish Maths (Upper KS2/KS3)

A weighbridge is a huge platform that weighs trucks when they drive onto it. At the recycling centre there are two weighbridges, one on the way in and one on the way out.

Question 1

A truck arrives at the recycling centre.

Write down / draw how you would solve the problem to work how many tonnes of recycling are in the truck.

Question 2

The weight of an empty truck or container is called the "tare weight".

Using subtraction or addition, fill in the gaps in the table below to work out the following trucks:

Weight of the full truck on the way in (in tonnes)	Tare weight in tonnes	Tonnes of recycling in the truck
25	15	
27		14
	15	18
38.5	16.7	
41.75		24.5
	18.75	25.25





Question 3 a

If a truck has 25 tonnes of materials for recycling inside and of this:
14.25 tonnes of it are glass bottles and jars
2.75 tonnes are plastic bottles
2.25 tonnes are steel cans
1.5 tonnes are aluminium cans



What is the percentage of each of the materials in the truck?



Fill in the table below.



Material	Tonnage of each material in the truck	Percentage of each material in the truck
Glass bottles and jars	14.25	
Plastic bottles	2.75	
Steel cans	2.25	
Aluminium cans	1.5	
totals		



Remember, the truck had a total of 25 tonnes of materials in it and percentages should always add back up to 100%. Do a total of the tonnage and a total of the percentage. Do these add back up to the original amount of 25 tonnes and 100%?



yes or no? Why do you think this is?



Question 3 b

Some people put the wrong items into their recycling. This is called *contamination* and it can affect all the good items from being separated and recycled correctly. What sort of things or items do you think might be contamination?





Can you work out how many tonnes of contamination are in the original truck and the percentage of that contamination? Show how you have worked that out.





Teachers notes / answers

Curriculum: Solve addition and subtraction multi-step problems including decimals in unfamiliar and non-routine problems, deciding which operations and methods to use and why. Interpret percentages and express a quantity as a percentage of another.

Question 1: The truck would go over a weighbridge on the way in when it is full of recycling. It then tips out the recycling and when it is empty it drives over the second weighbridge on the way out.

Subtract the weight of the empty truck from the weight of the full truck to calculate how much recycling was in the truck.

Question 2:

Weight of the full truck on the way in (in tonnes)	Tare weight (in tonnes)	Tonnes of recycling in the truck
25	15	10
27	13	14
33	15	18
38.5	16.7	21.8
41.75	17.25	24.5
44	18.75	25.25

Question 3 a:

Material	Tonnage of each material in the truck	Percentage of each material in the truck
Glass bottles and jars	14.25	57
Plastic bottles	2.75	11
Steel cans	2.25	9
Aluminium cans	1.5	6
totals	20.75	83

No. The totals do not add back up to 25 tonnes or 100%. Some example reasons that students may give: There is something else in the truck; they have weighed it wrong; the weighbridge does not work properly. The correct answer is that; there are also certain amounts of items of contamination that people have put into their recycling bins.

Question 3 b:

Contamination in the mixed recycling is usually: Lots of plastic pots, tubs and trays and plastic bags. Wires or cables. Some metal items such as frying pans and saucepans. Lids off bottles and jars.

Out of the original truck of 25 tonnes, the contamination is $25 - 20.75 = 4.25$ tonnes and that is 17%

