Resource:	Resource 6 – Crunching Numbers
Text:	This resource uses numbers to explore the issue of food waste. It involves maths and literacy skills.
Suitable for:	S1-S2
Approximate time:	30 minutes
Curriculum links:	MTH 2-21a, MTH 3-21a, MTH 4-21a
Meta-skills:	Self-Management: Focussing Innovation: Critical thinking
SDGs links:	2, 12

Crunching Numbers

1. Using the numbers on the right, calculate the total carbon impact to one decimal place of getting 1kg of each food type from farm to fork.

2. Using the results from question 1, calculate the total carbon impact of all four food types.

3. We now know what the individual carbon impacts are for each of our ingredients. Now let's use this and the information below to calculate the carbon impacts for one portion of Spaghetti Bolognese when one portion includes:
   a. 70 grams of pasta
   b. 100 grams of mince
   c. 180 grams of tomatoes
   d. 50 grams of carrots

Farm to Fork Carbon impact by food type ($kgCO_2e/kg$ food)

	Beef	Carrots	Tomatoes	Pasta
Growing	83.33	0.37	3.25	3.13
Processing	0.70	0.40	0.17	0.64
Transporting	0.35	0.36	0.36	0.36
Packaging	0.17	0.17	0.17	0.17
Storing	0.93	0.62	0.31	0.62
Total carbon impact per kg				

4. You now know the total carbon impact of one portion of Spaghetti Bolognese, but what percentage of the total is each food group to one decimal place?

5. The total carbon impact of a pasta dish made with mushrooms rather than meat is 1.79 $kgC0_2e$. Which meal has a lower carbon footprint - the Spaghetti Bolognese or the mushroom pasta?

6. Imagine a group of 3 people. 3 people only eat half (50% or 0.5) of their Spaghetti Bolognese meal and the other half is waste.
   a. How many total portions have been wasted?
   b. Now we know what the total carbon impact of one portions is, how may emissions did we generate to create the wasted portions?

7. Wasting 1 kg of Spaghetti Bolognese in landfill will generate 0.99 $kgCO_2e$. Wasting 1 kg of Spaghetti Bolognese in the food recycling bin will generate 0.01 $kgCO_2e$. How many times more harmful is it to put wasted food in the landfill bin rather than the recycling bin?

Answers

1. Meat 85.5, Carrots 1.9, Tomatoes 4.3, Pasta 4.9

2. 96.6 $kgCO_2e$

3. a. 4.9 x 0.07 = 0.34
   b. 85.5 X 0.1 = 8.55
   c. 4.3 x 0.18 = 0.77
   d. 1.9 x 0.05 = 0.09

4. Meat 87.7%, Carrots 0.9%, Tomatoes 7.9%, Pasta 3.5%

5. Mushroom pasta.

6. a. 3 x 0.5 = 1.5
   b. 9.75 x 1.5 = 14.62 $kgCO_2e$

Farm to Fork Carbon impact by food type ($kgCO_2e/kg$ food)

	Beef	Carrots	Tomatoes	Pasta
Growing	83.33	0.37	3.25	3.13
Processing	0.70	0.40	0.17	0.64
Transporting	0.35	0.36	0.36	0.36
Packaging	0.17	0.17	0.17	0.17
Storing	0.93	0.62	0.31	0.62
Total carbon impact per kg	**85.5**	**1.9**	**4.3**	**4.9**

When you put food waste in a rubbish bin that is sent to landfill, it breaks down and rots in the bin bags creating more greenhouse gases which harm our planet. So when you throw food away not only are you wasting all the emissions that went in to producing the food; you're also creating new greenhouse gas emissions!

When you put food waste in a separate food waste bin it doesn't go to landfill. Instead, it is treated in a process called anaerobic digestion, which ensures all the gas created is captured so it cannot enter the atmosphere!

7. 99 times more harmful.