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YOUR PLANETARY PLATE

Put together a meal that's good for you and the planet!

YOUR MISSION

Fill your plate with ingredients that give you all the energy you need to be healthy, without sacrificing the health of the environment.

Stick to your planetary budget, choose your favourite foods, and discover eco-friendly ways of eating!



1 CHOOSE YOUR INGREDIENTS

Select:

- 2 vegetables
- 1 protein
- 1 complex carbohydrate

2 RESPECT YOUR PLANETARY BUDGET

Each ingredient costs a certain number of tokens, depending on its environmental impact. You only have 10 tokens, so use them wisely!

3 COMPLETE THE CHALLENGE

You have 1 minute. Ready? Go!



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Setup and preparation

1 PRINT THE MATERIALS

Appendix 1 has everything you need for this game: the ingredients that players will get to choose from and the plate on which they will build their meal (you can also create your own using a piece of cardboard).

2 PREPARE THE INGREDIENTS

You will need to write two things on the back of each ingredient:

1. The type of food (vegetable, protein or complex carbohydrate)
2. The number of tokens the ingredient costs

All of this information can be found in the tables below.

Ingredient	Type	Tokens
Beans	Protein	3
Lentils	Protein	2
Tofu	Protein	3
Tempeh	Protein	3
Edamame	Protein	1
Chickpeas	Protein	2
Eggs	Protein	3

Ingredient	Type	Tokens
Ground beef	Protein	12
Cheese	Protein	10
Chicken	Protein	6
Farmed fish	Protein	8
Tomatoes	Vegetable	2
Corn	Vegetable	2
Green peas	Vegetable	1

Ingredient	Type	Tokens
Leeks	Vegetable	1
Lettuce	Vegetable	1
Zucchini	Vegetable	1
Broccoli	Vegetable	1
Bell peppers	Vegetable	1
Potatoes	Carbohydrate	1

Ingredient	Type	Tokens
Rice	Carbohydrate	3
Pasta (wheat)	Carbohydrate	2
Bread (wheat)	Carbohydrate	2

Please note: The scale used to calculate the token cost of each ingredient is nonlinear and based on the actual greenhouse gas emissions generated by these foods during their production and processing. For more information, please see ***Appendix 2****.*

3 PREPARE TO DISCUSS

In most cases, students won't get their plate right on the first try, so ask them to keep trying until they achieve a planetary budget score of 10 or less. If several students are playing the game at the same time, you can compare their plates.

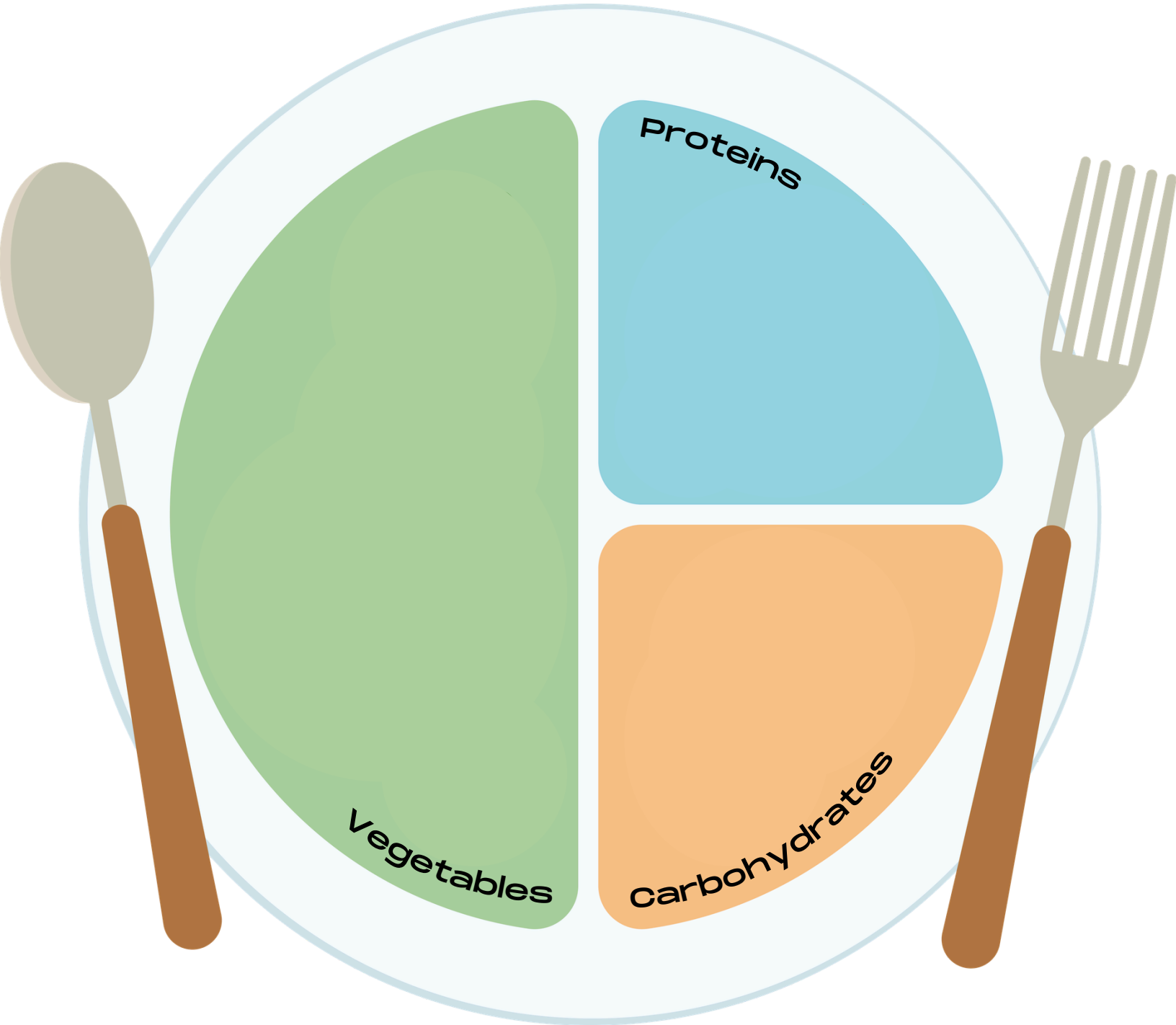
Once a plate is successfully created, several questions can spark discussion:

- What changes did you make to reduce the environmental impact of your plate? Which types of food did you change?
- In your opinion, which food has the greatest impact on the planet? Why? (*Answer:* Beef, because cows emit methane during digestion.)
- What would be a good way to reduce the environmental impact of your meals? (*Answer:* Eat more plant-based proteins.)

Further reading

Appendix 2 contains more information on the environmental impact of the various ingredients included in this game, including their greenhouse gas (GHG) and water footprints, as well as their impact on deforestation and biodiversity.

APPENDIX 1





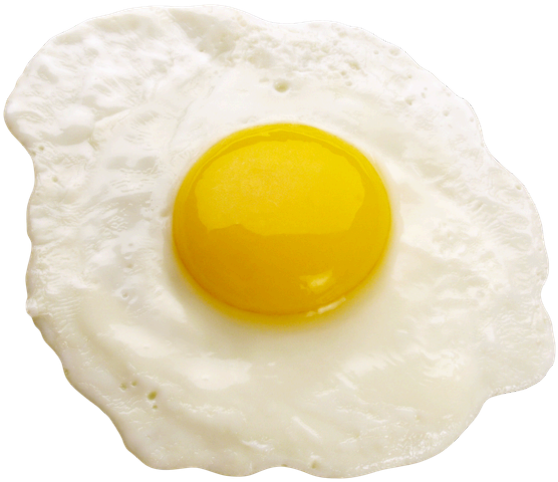












































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APPENDIX 2

The impact of different types of food based on several environmental factors

Ingredient	Proteins per 100g, when applicable (according to Health Canada's *Canadian Nutrient File*)	GHG (CO_2 equivalent) per kg of food produced	Amount of water used (L per kg of food produced)	Soil usage (m^2 per year per kg of food produced)
Cut of beef	21,18	99,48[1]	1451[1]	326,21[1]
Ground beef	19,58	33,3[1]	2714[1]	43,24[1]
Zucchini	0,9	0,53[1]	103[1]	0,38[1]
Farmed shrimp	13,61	26,87[1]	3515[1]	2,97[1]
Edamame	12,95	0,60[2]	*N/A*	*N/A*
Cheese	20	23,88[1]	5605[1]	87,79[1]
Chia seeds	16,54	6,55[2]	*N/A*	*N/A*
Hemp seeds	32,73	6,55[2]	*N/A*	*N/A*
Pumpkin seeds	30,23	1,34[2]	*N/A*	*N/A*

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Ingredient	Protein per 100g, when applicable (according to Health Canada's *Canadian Nutrient File*)	GHG (CO_2 equivalent) per kg of food produced	Amount of water used (L per kg of food produced)	Soil usage (m^2 per year per kg of food produced)
Beans or legumes	23,58	4,03[2]	~4000[4]	5,9[3]
Lentils	24,63	1,66[2]	~4000[4]	4,7[3]
Nutritinal yeast	49*	3,34[2]	*N/A*	*N/A*
Corn	2,8	1,7[1]	216[1]	2,94[1]
Millet	11,02	1,50[2]	4306[4]	*N/A*
Nuts	15,23	0,43[1]	4 134[1]	12,96[1]
Eggs	11,8	4,67[1]	578[1]	6,27[1]
Pasta (wheat)	0	1,57[1]	648[1]	3,85[1]
Green peas	4,7	0,98[1]	379[1]	7,46[1]
Leeks	1,5	0,5[1]	14[1]	0,39[1]
Split peas	23,82	*N/A*	397[1]	3,2[3]

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Ingredient	Protein per 100g, when applicable (according to Health Canada's *Canadian Nutrient File*)	GHG (kg of CO_2 equivalent) per kg of food produced	Amount of water used (L per kg of food produced)	Soil usage (m^2 per year per kg of food produced)
Chickpeas	20,47	1,45[1]	~4000[4]	*N/A*
Farmed fish	17,83	13,63[1]	3691[1]	8,41[1]
Potatoes	1,81	0,46[1]	59[1]	0,88[1]
Pork	18,71	12,31[1]	1796[1]	17,36[1]
Chicken	17,48	9,87[1]	660[1]	12,22[1]
Textured vegetable protein	51*	4,37[2]	*N/A*	*N/A*
Rice	6,9	4,45[1]	2248[1]	2,8[1]
Lettuce	0,7	0,51[1]	119[1]	0,38[1]
Buckwheat	13,25	0,58[2]	648[1]	3,85[1]
Tempeh	18,54	2,64[2]	*N/A*	*N/A*
Tofu	8,19	3,16[2]	149[1]	3,52[1]
Tomatoes	0,7	2,09	370[1]	0,8[1]

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Data sources

*[U.S. Department of Agriculture - FoodData Central]

[1] Poore, J., & Nemecek, T. (2018). *Reducing food's environmental impacts through producers and consumers*. Science, 360(6392), 987-992. Data also available at ourworldindata.org.

[2] ClimateHub / CarbonCloud

[3] Tidåker, P., Potter, H. K., Carlsson, G., & Röös, E. (2021). *Towards sustainable consumption of legumes: How origin, processing and transport affect the environmental impact of pulses. Sustainable production and consumption,* 27, 496-508.

[4] Mekonnen, M., & Hoekstra, A. Y. (2010). *The green, blue and grey water footprint of farm animals and animal products.* Volume 2: Appendices.

N/A : Data not available.



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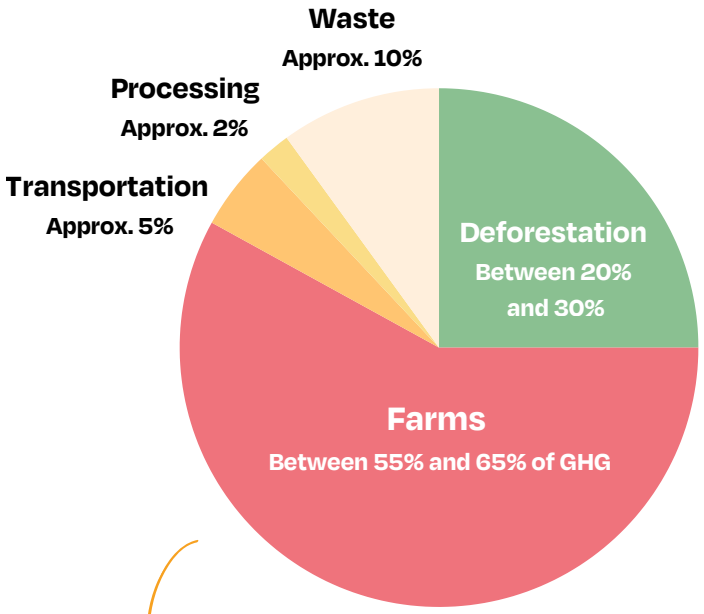
Greenhouse gases

Our food accounts for 30% of global greenhouse gas emissions

Where do these greenhouse gases come from?



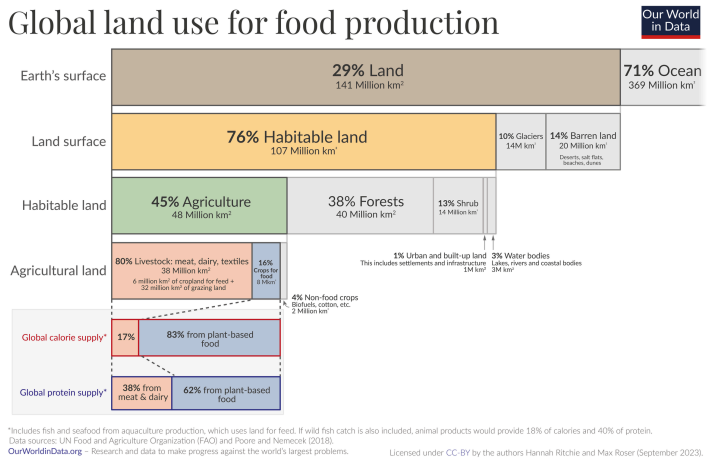
OurWorldinData

Meat and dairy products are the largest sources of greenhouse gas emissions in food production.

What is the impact of my meal?

Lands

45% of arable land is used for agriculture



OurWorldinData

Most of this agricultural land is used for livestock (80%). The rest is used for food crops (16%) and non-food crops like cotton and biofuel (4%) .

Water

70% of freshwater is used for agriculture

*Interesting fact: Ground beef produces fewer greenhouse gases than cuts of meat because it is made using former dairy cows that are fed a diet that is easier to digest than beef cattle. As a result, these cows and their diet produce less methane during digestion.

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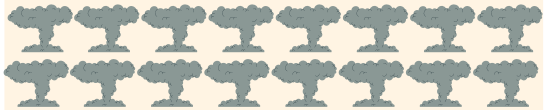
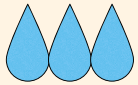
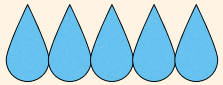
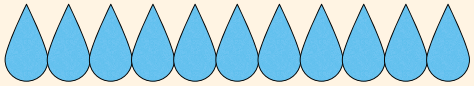
	Greenhouse gas emissions	Water consumption	Land use
Cut of beef*			 x 600
Ground beef*			 x 9
Chicken			
Cheese			 x 17
Tofu			
Beans			

 x 1 Less than 1 kg of GHG per kg of food

 x 3 Between 3 kg and 5 kg

 x 6 Between 8 kg and 10 kg

 x 8 Between 10 kg and 20 kg

 x 12 Between 20 kg and 40 kg

 x 16 More than 70 kg

 Approx. 500 L per kg of food produced

 Approx. 5m² per year per kg of food produced