

# THE VALUE WITHIN OUR FOOD



## Module 9 Student Handouts

Instructions: It is easiest to print this document **double-sided**. Print 1 copy for every 2 students in your class. Individually cut out the Food Supply Chain Cards and the Food Loss and Waste Cards from pages 2-6 into card decks.



# WHAT IS FOOD WASTE AND HOW DOES IT DIFFER FROM FOOD LOSS?



**Food Loss:** The food that does not reach retail and consumers. Food loss is often the result of lack of technology, extreme weather events, inadequate storing, and contamination.

**Food Waste:** The food that is lost while still safe and nutritious. Food waste is more common in higher-income countries, and is the result of consumer behaviors, government policies, poor planning, and misinformation on labelling.

# ACTIVITY #1: FOOD SUPPLY CHAIN CARDS

## Processing



## Packaging



## Marketing



### Nutrition Facts

|                      |  |
|----------------------|--|
| Serving Size 16 oz   |  |
| Amount Per Container |  |
| Percent Daily Values |  |
| Calories             |  |
| Total Fat            |  |
| Saturated Fat        |  |
| Trans Fat            |  |
| Cholesterol          |  |
| Sodium               |  |
| Total Carbohydrate   |  |
| Dietary Fiber        |  |
| Sugars               |  |
| Protein              |  |

## Storage



## Production



## Distribution



## Retail



## Consumption





**Food Up!**



**Food Up!**



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**ACTIVITY #1: FOOD LOSS AND FOOD WASTE CARDS**



Drought or Storm impacting food yields



Crops spoiled due to inadequate storage



Food contaminated from bacterial exposure when poorly handled



Edible, safe food thrown away



Food deemed too 'ugly' to sell or accept



Food becomes spoiled in your home



Food becomes stale or spoils fast from inadequate sealing



Unsold food thrown away in grocery stores



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## ACTIVITY #1: FOOD LOSS AND FOOD WASTE CARDS



Food becomes unprofitable to sell and is not harvested or delivered



Consumers overbuy products with not enough time to eat it all



Pests feed off of crops and harvest



Food is left on plate from too large of a portion



Consumers throw out edible food due to confusion of food labels



Removal of edible food portions, such as fat, skin, and peels



Crops are unable to be transported due to lack of infrastructure



Crop loss due to lack of access to technology



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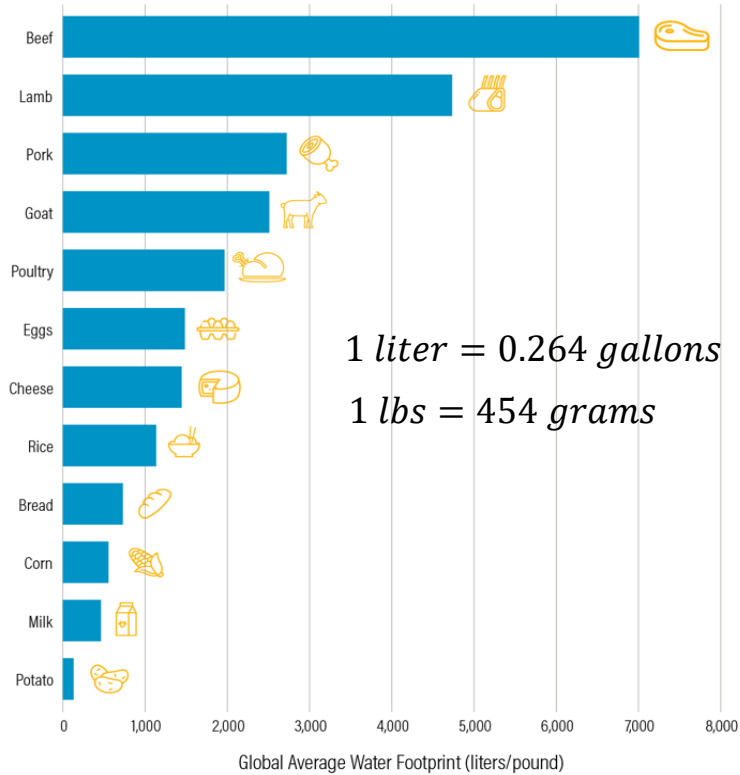


**Food Up!**



# HOW MUCH GOES INTO OUR FOOD?

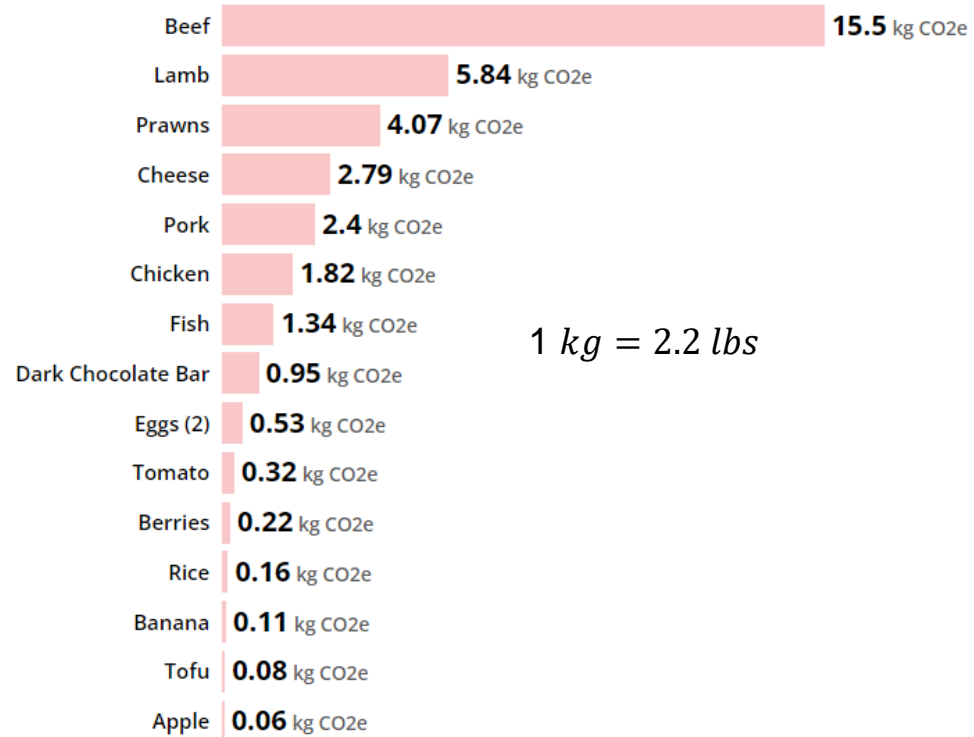
## WATER



Source: Water Footprint Network.



## GREENHOUSE GAS EMISSIONS



Note: Taken from "Food," by CO2 Everything, 2018 (<https://www.co2everything.com/category/food>).

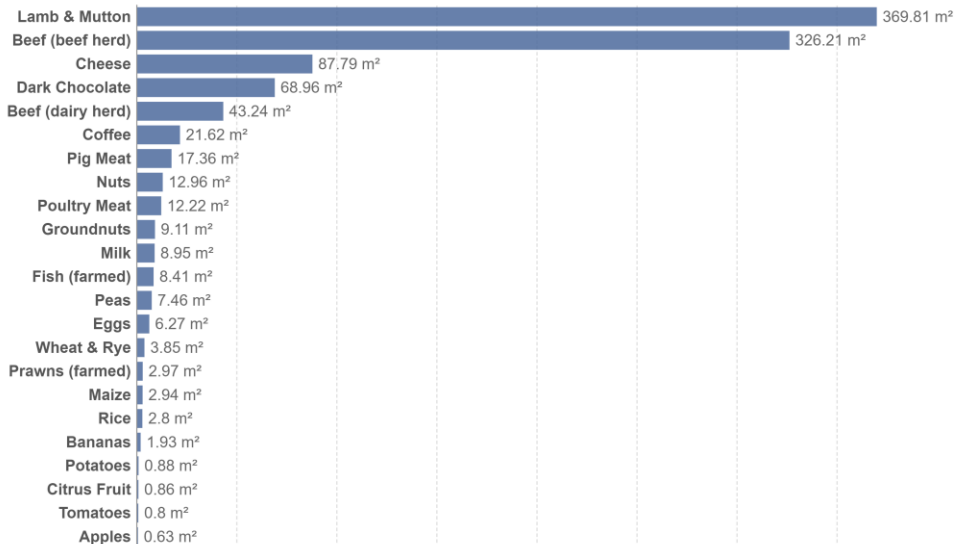
Note: Taken from "Water could limit our ability to feed the World," by the World Resources Institute, 2020 (<https://impakter.com/water-could-limit-our-ability-to-feed-the-world-these-9-graphics-explain-why/>).

# HOW MUCH GOES INTO OUR FOOD?

## LAND

### Land use per kilogram of food product

Land use is measured in meters squared (m<sup>2</sup>) per kilogram of a given food product.

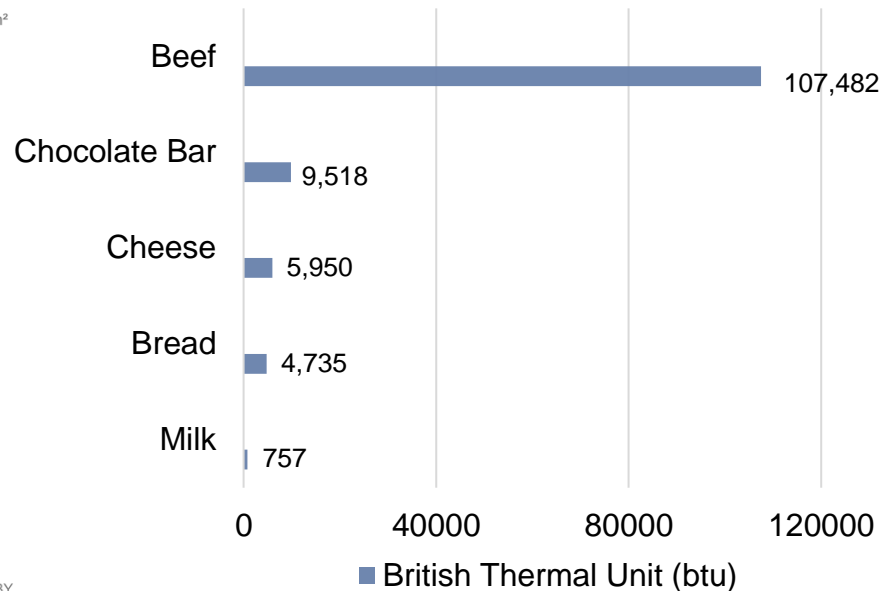


Source: Joseph Poore and Thomas Nemecek (2018).

OurWorldInData.org/environmental-impacts-of-food • CC BY

## ENERGY

### Energy use per pound (lb.) of food product



■ British Thermal Unit (btu)

*1 square meter = 10.76 square feet*

*1 btu = 0.252 kilocalories*

*1 lb = 0.12 gallons*





*1 lb = 454 grams*

Note: Taken from "Environmental Impacts of Food Production," by Our World In Data, 2019 (<https://ourworldindata.org/environmental-impacts-of-food>).

Names:



Bread is the **MOST** wasted food in the US, with over 240 million slices of bread thrown away each year.<sup>1</sup>

| <i>How much goes into <b>ONE</b> loaf of bread?</i>  | Estimated | <b>Actual</b> |
|--|-----------|---------------|
| Pounds of <b>Carbon Dioxide</b><br> |           |               |
| Gallons of <b>Water</b><br>         |           |               |
| <b>Energy</b><br>                   |           |               |
| <b>Land Used</b><br>              |           |               |



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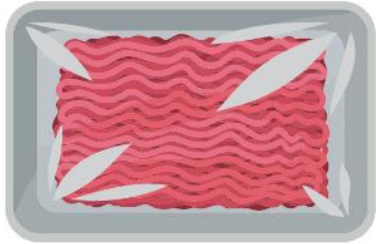


**Food Up!**







**Food Up!**

Names:



Each year, 5 million acres of rainforest are deforested in South and Central America for cattle pasture.<sup>2</sup>

The water it takes to produce **ONE** pound of beef is equivalent to showering for 12 hours.<sup>3</sup>

| <i>How much goes into <b>ONE</b> pound of beef?</i>  | Estimated | Actual |
|--|-----------|--------|
| Pounds of <b>Carbon Dioxide</b><br> |           |        |
| Gallons of <b>Water</b><br>         |           |        |
| <b>Energy</b><br>                   |           |        |
| <b>Land Used</b><br>              |           |        |



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**Food Up!**

Names:



Cheese is one of the top foods contributing to greenhouse gas emissions, as it needs roughly 10 pounds of milk for one pound of cheese.<sup>4</sup>

| <i>How much goes into <b>ONE</b> serving size of cheese? (100g)</i>  | Estimated | <b>Actual</b> |
|--|-----------|---------------|
| Pounds of <b>Carbon Dioxide</b><br> |           |               |
| Gallons of <b>Water</b><br>         |           |               |
| <b>Energy</b><br>                   |           |               |
| <b>Land Used</b><br>              |           |               |



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**Food Up!**



Names:



In the United States,  
68 Olympic-size  
swimming pools of  
milk are wasted every  
year. That is  
equivalent to 45  
million gallons.<sup>5</sup>

| <i>How much goes into <b>ONE</b> gallon of milk?</i>   | Estimated | <b>Actual</b> |
|--|-----------|---------------|
| Pounds of <b>Carbon Dioxide</b><br> |           |               |
| Gallons of <b>Water</b><br>         |           |               |
| <b>Energy</b><br>                   |           |               |
| <b>Land Used</b><br>              |           |               |



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**Food Up!**

Names:



Over the past 60 years, Côte d'Ivoire has lost 94% and Ghana has lost 80% of their forest to cocoa production.<sup>6</sup>

| <i>How much goes into <b>ONE</b> chocolate bar? (100g)</i>   | Estimated | <b>Actual</b> |
|--|-----------|---------------|
| Pounds of <b>Carbon Dioxide</b><br> |           |               |
| Gallons of <b>Water</b><br>         |           |               |
| <b>Energy</b><br>                   |           |               |
| <b>Land Used</b><br>              |           |               |



**Food Up!**



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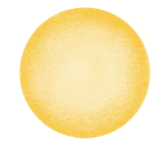





**Food Up!**

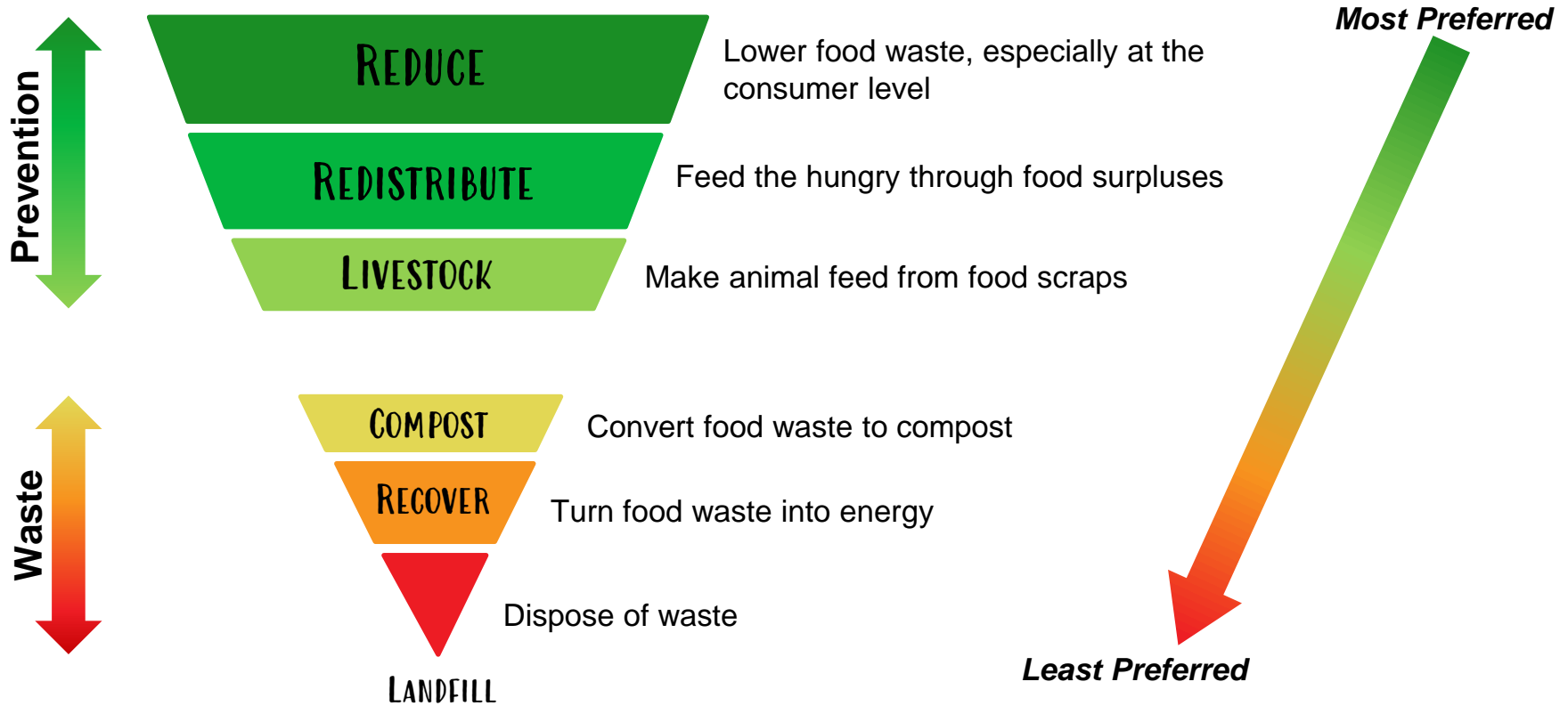


**Food Up!**

# ACTIVITY #2: FIGURE LEGEND

|  |   |   |
|--|---|---|
| <p>Pounds of <b>Carbon Dioxide</b></p>  | <p>1 lbs.</p>             | <p>5 lbs.</p>              |
| <p>Gallons of <b>Water</b></p>          | <p>50 gallons</p>         | <p>150 gallons</p>         |
| <p>Kilocalories of <b>Energy</b></p>    | <p>100 kcal</p>           | <p>1,000 kcal</p>          |
| <p><b>Land Used</b> in square ft</p>    | <p>10 ft<sup>2</sup></p>  | <p>100 ft<sup>2</sup></p>  |

# CONNECTING TO THE GARDEN: THE FOOD WASTE PYRAMID



## ACTIVITY #3: FOOD FACTS!

- Every year, 1/3 of the world's food is wasted or lost. The edible food we waste is enough to feed 3 billion people.<sup>7</sup>
- Uneaten food takes away 25% of our water supply 18% of our cropland, and 21% of our landfills.<sup>7</sup>
- The average American household tosses out 25% of the food they purchase.<sup>8</sup>
- Half of all produce is tossed out in the United States due to their appearance. This equates to 60 million tons of fruits and veggies.<sup>7</sup>
- Uneaten food accounts for around 10% of greenhouse gases.<sup>9</sup>
- It would only take saving ¼ of the food currently wasted to feed every hungry person.<sup>9</sup>
- If food waste was a country, it would be the third largest emitter of greenhouse gases, right behind the United States and China.<sup>9</sup>
- Food loss is more prevalent in low-income countries, as 40% of their food loss occurs at the post-harvest level. However, in high-income countries, more than 40% of food is wasted at the retail and consumer level.<sup>7</sup>



**Food Up!**



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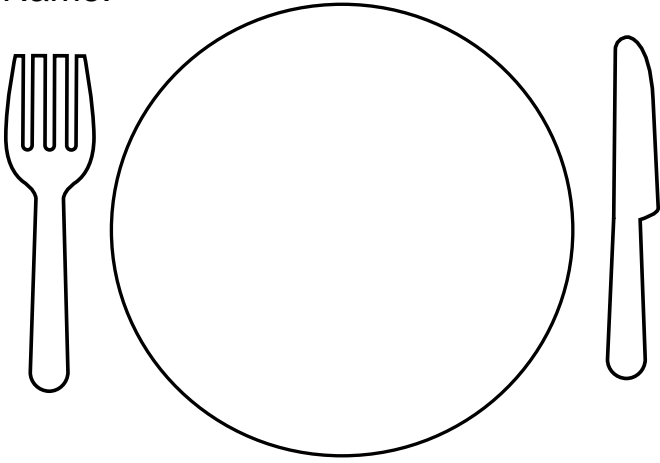


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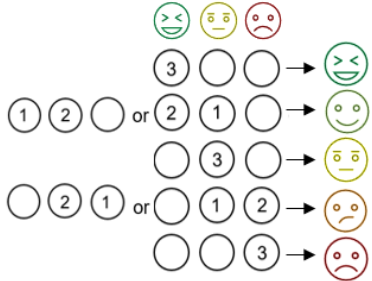
# ACTIVITY #4: EXPLORING OUR PLATE

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



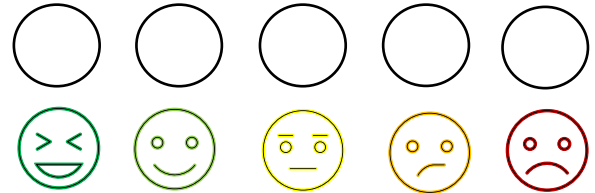
What was on your plate?

Plate Score Key:



|   |  |
|---|--|
| <p>How many food items were wrapped in plastic packaging?</p> <p> 0  1  2+</p>      | <p><input type="radio"/> <input type="radio"/> <input type="radio"/></p> |
| <p>How much food was left on your plate?</p> <p> 0  1-2 spoonfuls  3+ spoonfuls</p> | <p><input type="radio"/> <input type="radio"/> <input type="radio"/></p> |
| <p>How much of your meal came from other countries?</p> <p> None  Some  All</p>     | <p><input type="radio"/> <input type="radio"/> <input type="radio"/></p> |

Total Plate Score:



# REFERENCES

1. Ingini, M. (2022). *10 food waste statistics in America*. Earth.Org. <https://earth.org/food-waste-in-america/#:~:text=5.,every%20year%20across%20the%20country>.
2. *Food choices and the planet*. EarthSave. <https://www.earthsave.org/environment.htm>
3. Winchester, A. (2018). *The water footprint and waste of beef*. Union College. <https://muse.union.edu/mth-063-01-f18/2018/09/14/the-water-footprint-and-waste-of-beef/>
4. Hymas, L. (2011). *Is your cheese killing the planet?* Grist Magazine. <https://grist.org/sustainable-food/2011-08-08-is-your-cheese-killing-the-planet/>
5. Vernick, D. (2022). *Abandoning the carton: how bulk milk dispensers can help schools reduce waste*. World Wildlife Fund. <https://www.worldwildlife.org/stories/abandoning-the-carton-how-bulk-milk-dispensers-can-help-schools-reduce-waste#:~:text=To%20be%20precise%2C%20up%20to,of%20waste%20can%20be%20avoided>.
6. International Wildlife Conservation. (n.d.). *Cocoa and deforestation*. National Wildlife Federation. <https://international.nwf.org/cocoa-and-deforestation/>
7. Robinson, D. (2022). *25 Shocking facts about food waste*. Earth.Org. <https://earth.org/facts-about-food-waste/>
8. *Wasted food facts*. (n.d.). Stop Waste. <https://www.stopwaste.org/at-home/reducing-wasted-food/wasted-food-facts>
9. *Food waste facts*. (n.d.). Stop Wasting Food Movement. <https://stopwastingfoodmovement.org/food-waste/food-waste-facts/>

Worksheet adapted from “Every plate tells a story,” by World’s Largest Lesson (<https://worldslargestlesson.globalgoals.org/resource/plate-pioneerz-every-plate-tells-a-story/>).