

# Warm - Up

The word produce has two meanings.  
Write two sentences - each sentence  
should use one meaning of the word.

produce - fruits or vegetables

*Ms Lea bought some produce at the Hannaford.*

produce - to make something

*The new Honda factory is going to produce more cars  
than the old factory.*

# How can science help us feed a world of 9 billion people?



# What we know so far...

Many people do not have access to fresh fruits and vegetables because of the cost of food and the distance to grocery stores.

Over 40% of food is wasted because of how it looks or because the food goes bad before people have a chance to eat it.

Processing and transporting food long distances uses a lot of time, money, and energy.

These are the problems we face in a world of 7 billion people. If we continue to do things the same way, we will be unable to feed a world of 9 billion people (2050). We have to do things differently.

# Earth as an Apple...





# Earth's water...



Of all of the water on Earth, only 3% is fresh water (not salty)

Of that 3%, only 0.003% is usable to humans, the rest is frozen, polluted or too far underground to access.

# **Brainstorm**

What are the challenges of feeding 2 billion more people?

What are some ideas you have to feed a world of 9 billion people?



Scientists predict we need  
50% more food by 2050.



# Recommended Solutions:

**Grow more food** by increasing crop yields (how much food is produced per plant) and grow on more land

**Use water and other resources better**

**Get the most out of the calories that we do have** by eating less meat (since that uses a lot of calories to produce), distributing food better, and wasting less.



# Grow more food.

Use better farming techniques.



Grow in spaces not used before.



Biotechnology and GMOs (7th grade!)

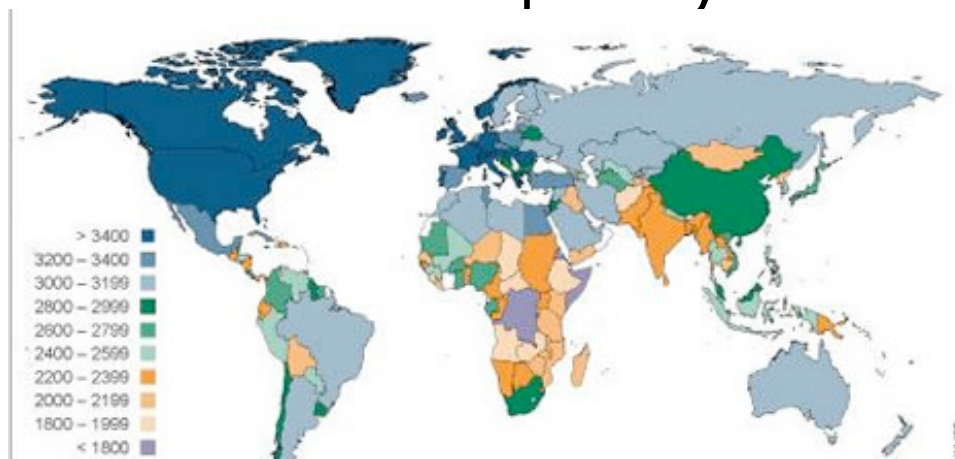
# Get the most out of the calories that we do have.

Use more food to feed people, not make fuel or feed animals.



*In the US, 40% of corn produced is used to make ethanol.*

Share calories more equally around the world.







feed

**6.7**

Pounds of  
grains and forage



water

**52.8**

Gallons for drinking water  
and irrigating feed crops



land

**74.5**

Square feet for grazing  
and growing feed crops



fossil fuel  
energy

**1,036**

Btus for feed production and  
transport. That's enough to power a  
typical microwave for 18 minutes.





# TO PRODUCE 1 POUND OF MEAT IT TAKES...



Beef



Lamb



Goat



Pork



Rabbit



Chicken



Grasshopper

Gallons  
of Water



?



?

Pounds  
of Grain



?



?

Pounds  
of CO2



?



?

It is recommended that people eat about **2000 calories a day.**

Currently, we produce enough food for everyone in the world to have **2700 calories** a day and 75 grams of protein...

but instead of having people eat 2700 calories a day, much of that food goes to feeding animals (for meat) and making ethanol (a type of fuel similar to gasoline).





A child dies of hunger every **5** seconds



**Bolivia**

Severe floods in 2007 and 2008 left thousands of families in need of WFP assistance.



**Tajikistan**

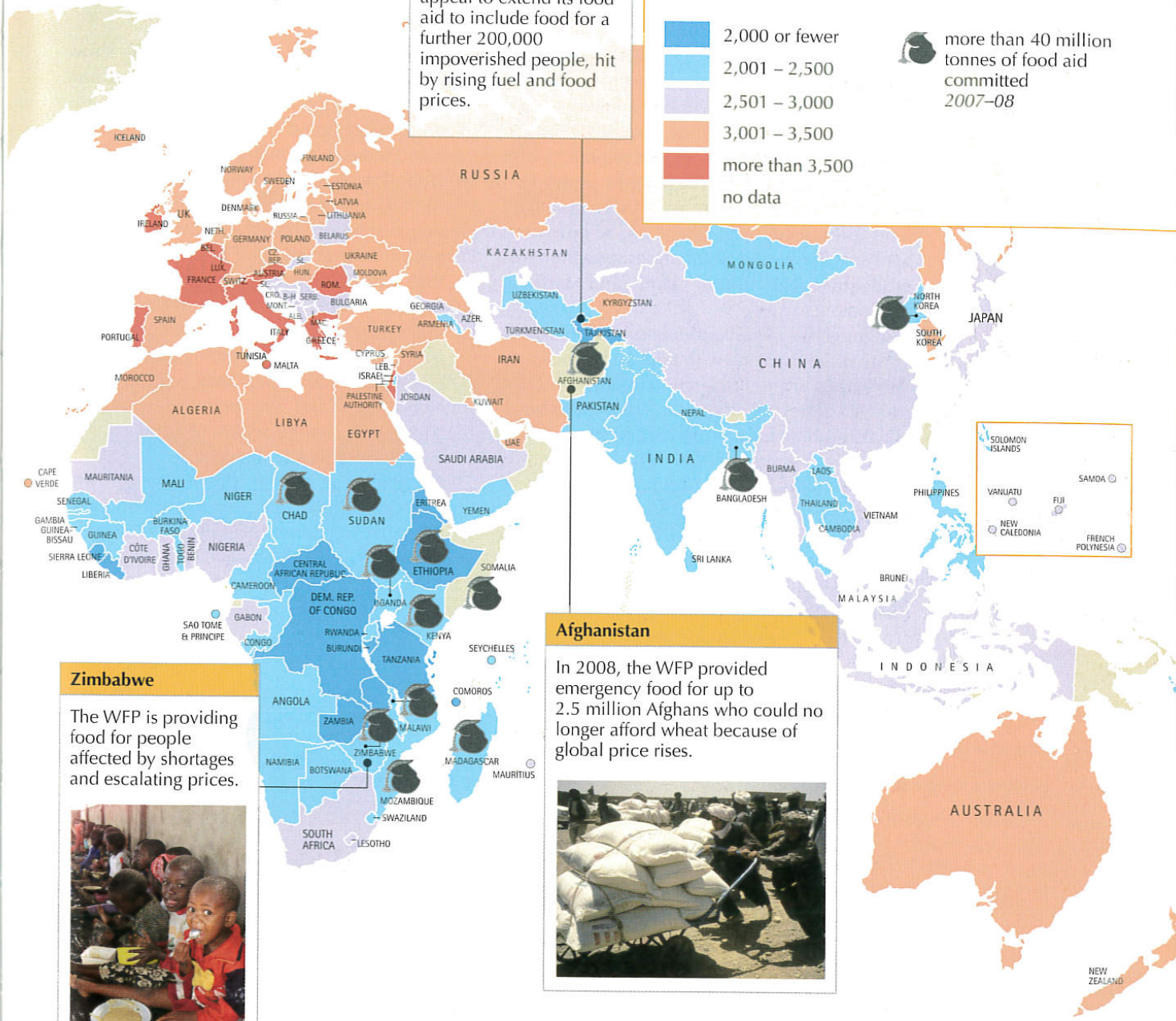
Freezing temperatures in 2008 led the WFP to appeal to extend its food aid to include food for a further 200,000 impoverished people, hit by rising fuel and food prices.

**CALORIES AVAILABLE**

Average daily calorie supply per person  
2003 or latest available data

- 2,000 or fewer
- 2,001 – 2,500
- 2,501 – 3,000
- 3,001 – 3,500
- more than 3,500
- no data

more than 40 million tonnes of food aid committed 2007-08



**Zimbabwe**

The WFP is providing food for people affected by shortages and escalating prices.



**Afghanistan**

In 2008, the WFP provided emergency food for up to 2.5 million Afghans who could no longer afford wheat because of global price rises.



Which countries consume the greatest amount of calories on average in the world?

Which countries consume the least amount of calories on average in the world?