Chapter 15 – Food & Agriculture
Notes – Section 1

***Think/Ink/Pair/Share***
Think: Read the questions and think about your answers.
Ink: Write down your answers to the questions in the space below.
Pair: Choose a partner and share your answers with each other.
Share: Volunteer to share your answers with the rest of the class.

Section: Feeding the World
Is there enough food available in the world to feed everyone? How many people in the world go hungry each day? If food is available, why does hunger exist?

Feeding the World
• In

____________________________________________________
____________________________________________________
____________________________________________________
____________________________________________________

Feeding the World
• In

____________________________________________________
____________________________________________________

• Famine is

____________________________________________________

• By 2050 farmers will need to feed about

____________________________________________________ (50% more than today)
Humans and Nutrition

- Humans use food as a _________________________ and as source of materials for ________________________.

- Energy in food is expressed in ____________________________ (Cal).

- Major nutrients we get from food are ____________________________

- __________

---

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Composition</th>
<th>Sources</th>
<th>Energy yield</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrates</td>
<td>sugars</td>
<td>wheat, corn, and rice</td>
<td>4 Cal/g</td>
<td>is the main source of the body's energy</td>
</tr>
<tr>
<td>Lipids</td>
<td>fatty acids and fatty alcohols</td>
<td>olives, nuts, and animal fats</td>
<td>9 Cal/g</td>
<td>helps form membranes and hormones</td>
</tr>
<tr>
<td>Proteins</td>
<td>amino acids</td>
<td>animal food and smaller amounts from plants</td>
<td>about 4 Cal/g</td>
<td>helps build and maintain all body structures</td>
</tr>
</tbody>
</table>

- **Malnutrition** is a disorder of nutrition that results when a person __________ that are needed by the human body.

- There are many forms of malnutrition. For example, humans need to get 8 essential amino acids from proteins. This is easily done if a variety of foods is eaten. However, in some parts of the world, the only sources of food may be __________, which contain protein, but __________. Can result from such a limited diet.
**Sources of Nutrition**

- **Diet** is ________________________________.

- A healthy diet is one ________________________________ of the right amounts of nutrients, minerals, and vitamins.

- In most of the world people eat large amounts of ________________________________ (rice, potatoes, and bread).

---

(1) What type of food is produced the most in the world? ________________________________

---

(1) Which continent consumes the most calories on average? ________________________________

(2) Which continent consumes the least calories on average? ________________________________
Diets Around the World
• People in more developed countries tend to eat ________________________________.
• People in developed countries tend to eat larger proportion of ________________________________.

The Ecology of Food
• As the human population grows, ____________________________ replaces forests and grasslands.
• Farming has also become more like an industry or factory in order to ________________________________.
• Feeding everyone while ________________________________ becomes increasingly difficult.
• Different kinds of agriculture have different ________________________________ and different levels of efficiency.

Food Efficiency
• The efficiency of a given type of agriculture is a ________________________________ with limited inputs of ________________________________.
• An ideal food crop is one that efficiently produces a ________________________________ ________________________________ ________________________________ ________________________________ ________________________________.
• On average, ________________________________ are used to produce a Calorie of food from ________________________________ than to produce a Calorie of food from plants.
Food Efficiency

• Animals that are raised for human use are usually fed
______________________________________, but because less energy is
available at each level on a food chain, only about
____________________________________ from the plants gets
stored in the animals.
• Thus, a given area of land can usually produce
__________________________________________ when it is used to
grow ____________________ than when it is used to
______________________________________.
• The efficiency of raising plants for food is one reason why diets around the world
are largely based on plants.
• However, meat from animals generally provides more
____________________________ per gram than most food from plants.

Old and New Foods

• **Yield** the
__________________________________________________________
__________________________________________________________.
• Researchers are interested in organisms that can thrive in various climates and
do not require
__________________________________________________________
__________________________________________________________.
• Glasswort, a salad green, may become an important food source because it can
grow in ________________________________.
• ____________________________________________ has been harvested
and eaten by humans for centuries.
World Food Problems

- Some people become malnourished because they simply ____________________________________________________________________________.
- More food is needed each year to feed the world’s ____________________________________________________________________________.
- World food production has been increasing for decades, but now food production is ____________________________________________________________________________.

Unequal Distribution

- If all the food in the world today were divided ____________________________________________________________________________ among the human population, no one would have quite ____________________________________________________________________________.
- But food is not divided equally, and malnutrition is largely the result of ____________________________________________________________________________. Even in the United States, many poor people suffer from ____________________________________________________________________________.
- Wars and political strife can also lead to malnutrition because they interrupt ____________________________________________________________________________.

Source: U.S. Department of Agriculture.
Droughts and Famines

- A drought is a prolonged period during which
  and crops grown without ________________________________ may produce low
  _____________________ or fail entirely.
- A drought is more likely to cause famine in places where most food is
  __________________________________________________.
- If a drought occurs, there may be
  ____________________________________________________.
  The effects of a drought can continue for ________________________________.

Droughts and Famines

- People in a given area can usually survive ______________ crop failure. They
  may have saved enough food from previous seasons, or they may have systems
  for importing food from elsewhere.
- But
  ____________________________________________________ for ________________________________ of the world.
- For example, after a long drought, the soil may be
  ____________________________________________________.

The Green Revolution

- *The Green Revolution* (1950-1970) is when Mexico increased wheat production
  eight-fold and India doubled its production of rice
  ____________________________________________________.
- ____________________________________________________________________________ if
  they are supplied with enough
- Most of the increase in production came from
  __________________________________________ farms.
- Research today is devoted to developing plants that produce
  ____________________________________________.
- ____________________________________________________________________________ to scattered rural farms remains a problem.
1. What is famine?
   ________________________________________________________________
   ________________________________________________________________

2. What is malnutrition?
   ________________________________________________________________
   ________________________________________________________________

3. What are the three main nutrients you get from food? Include an example of a food you get that nutrient from.
   1. _____________________________________________________________
   2. _____________________________________________________________
   3. _____________________________________________________________

4. What type of food is more efficient to produce? Why?
   ________________________________________________________________
   ________________________________________________________________

5. Explain the Green Revolution.
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________