

Farm to Fork

UNIT 4 Feed the World

Economics, Poverty, Population and Carrying Capacity,
Genetically Modified Organisms

Lesson 2: Poverty, not just a lack of Money

F2F1

UNIT 4

Global Food – Week 16

Greenhand Test

- Jacob, Miguel, Quincy look at the test and figure out which questions you got wrong and why.
- Students get into one of the 3 groups of Jacob, Miguel and Quincy.
- Get a Official FFA Manual
- Page 47 Notebook – Write down the questions you got wrong, find the answer in the FFA Manual, Write the answer in the Notebook. Discuss the correct answer with your team leader.
- Then students can retake the test again.
- Must earn a 20 or $>$ to be Proficient to earn your Greenhand degree.

Poverty, Not Just a lack of \$

Obj. TSW learn about poverty and why it still exists. P. 52 NB



1. What is poverty?
2. What does poverty look like?
3. How are food insecurity and poverty related?



Feed the Need

Obj. TSW research local, state-wide, country-wide, and international programs that work to feed people. P. 54 NB



1. Off the top of your head, what are some organizations that feed people in poverty.
2. Would you volunteer at some of these organizations?
3. How can we be part of the feed the need?

Genetically Modified Organisms

Obj. TSW learn the pro's and con's of producing/ growing GMO's by reading a articles about GMO's. p. 56 NB

A GMO IS:
the direct human manipulation of an organism's DNA in a laboratory environment.

GMO?

Genetically Modified Organism

A GMO IS NOT:
Plants and animals that are traditionally bred to achieve specific characteristics such as breeding dogs or cross-pollination of plants.

SCIENCE OF GMOS

Genetic modification may include the ADDITION OF DNA from species that would NOT BREED in nature.

Genetic modification may also involve REMOVING SPECIFIC STRANDS OF DNA.

Cross-species—or transgenic—genetic manipulation has gone so far as to **COMBINE FISH DNA WITH STRAWBERRIES** and tomatoes.

GMO foods have only existed in groceries since the late 1990's.

GMO life can be patented.

GMO varieties of corn and potatoes are engineered to **PRODUCE THEIR OWN PESTICIDES**.

STUDIES OF GMOS

NO LONG-TERM TESTING.
It took decades for the dangers of Trans-Fats (another artificial food) to become understood.

Mice fed GM pesticide-producing corn over four generations showed **ABNORMAL** structural and chemical changes to various organs and significantly reduced fertility.

herbicide-resistant crops can cross-pollinate to create **HERBICIDE-RESISTANT WEEDS**.

Pesticide-producing GMO crops have led to **RESISTANCE IN INSECTS**.

TRANSGENIC DNA HAS BEEN FOUND IN **80% OF WILD CANOLA** IN NORTH DAKOTA.

PREVALENCE OF GMOS

You probably eat GMOs **EVERY DAY**.

30,000 different GMOs exist on grocery store shelves (largely because of how many processed foods contain soy.)

PERCENT OF GMOS IN TOTAL CROP PRODUCTION 2011 (USA)

Soybeans	94%
Corn	90%
Cotton	86%

PUBLIC OPINION OF GMOS

Polls consistently show that a significant majority of North Americans would **LIKE TO BE ABLE TO TELL** if the food they're purchasing contains GMOs.

OUT OF A CBS NEWS POLL:

- 87% want GMOs labelled
- 53% would not buy genetically modified food

NATIONAL OPINIONS OF GMOS:

- The USA is the **largest** producer of GMO crops and **does not mandate** labels for GMO food.
- In 30 other countries there are bans or restrictions on the production of GMOs, because they are **not considered** proven safe.

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1. What was your article about?
2. What are some concerns about GMO's after reading this article?
3. What are some benefits about producing GMO?

Solutions to Feed the Need: GMO's

Obj. TSW research the pro's and con's of GMO's as a solution to decrease poverty. P. 58 NB

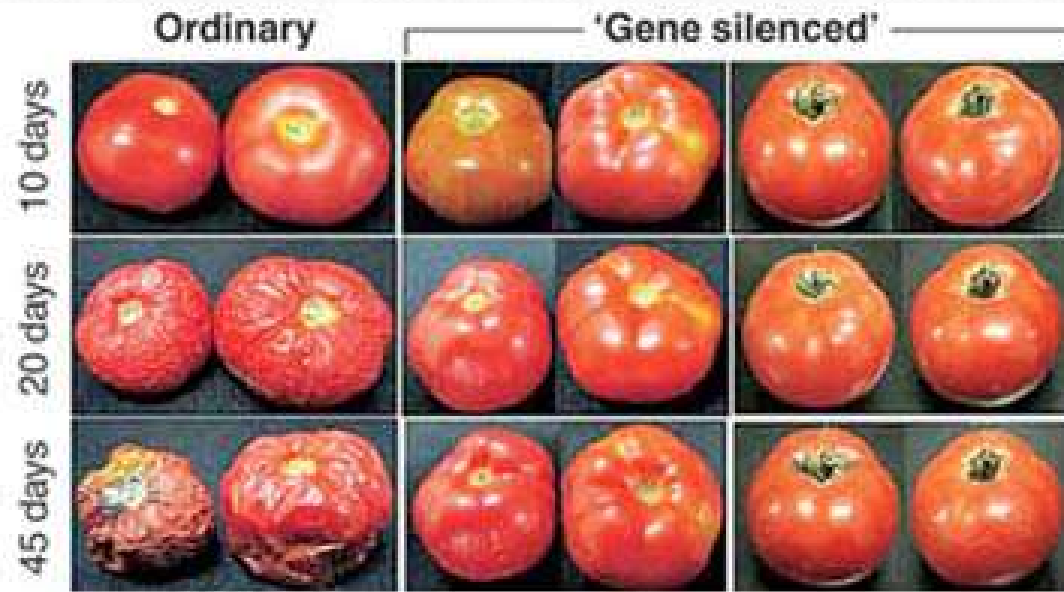


Image shows three sets of tomatoes. The ordinary control tomatoes (extreme left) soften and shrivel up, while texture of gene-silenced tomatoes remains intact for up to 45 days.

Photo credit: Asis Datta, Subhra Chakraborty, National Institute of Plant Genome Research, New Delhi

1. Look at the picture to the left. Compare the two types of tomatoes. Which one is GMO?
2. What examples of GMO do you know about?
3. Explain Genetically Modified Organisms in your own words.

GMO Video

Obj. TSW watch a video about GMO's and take notes about some benefits and concerns about Genetically Modified Organisms. P. 60 NB

Top 10 genetically modified foods



Corn



Soy



Cottonseed



Papaya



Rice



Rapeseed
(Canola)



Potatoes



Tomatoes



Dairy products



Peas

www.HealingPowerHour.com

1. What does GMO stand for?
2. Before you watch the video, what do you think you know about GMO's
3. What do you want to learn about GMO's?

Who Controls the Food?

Obj. TSW have a greater understanding of why countries import and export food.



1. What country has the most people?
2. What country has the least amount of food?
3. What country has the most food?

Activity: Who Controls the food?

- You will be assigned a country/continent: Africa, Europe, America, South America, Asia,
- Stand Next to your country.
- Then the food (Small Carrots, Grapes) will be handed out in proportion to the amount of food that country has.
- How did you feel about the amount of food your received?
- Is it fair that North America has the majority of the food but not the majority of the people?
- Write a ½ page reflection describing your feelings about this experience. For example, how did it feel to have minimal food when others had more than they needed?
- What can be done to Feed the Need?

Lesson 3: Genetically Modified Organisms

F2F1 UNIT 4

Global Food

GMO Research Activity

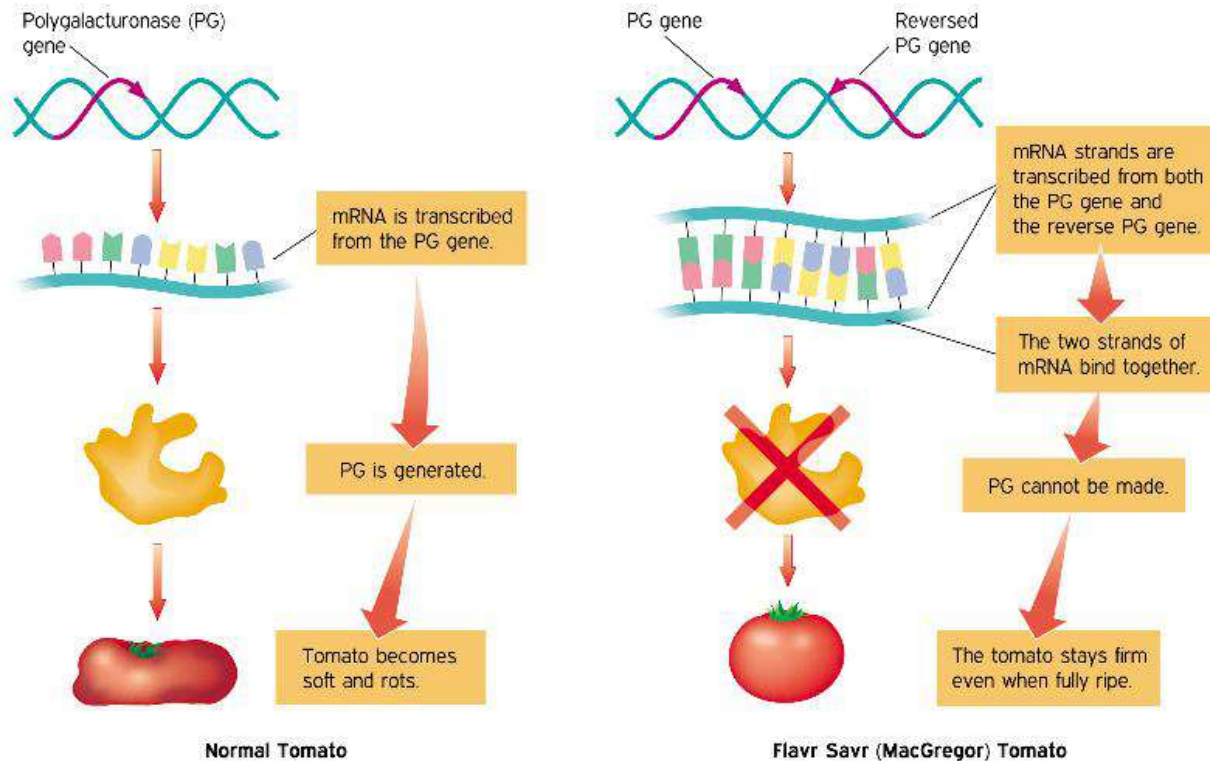
- Pro GMO
- Find 6 Arguments for GMO's

Con GMO
Find 6 Arguments against using
GMO's

Guest Speakers = GMO

Pro's & Con's GMO's

Obj. TSW create an argument for or against
GMO's.



1. From your research yesterday, write three arguments for GMO's.
2. From your research yesterday, write three arguments against GMO's.
3. What is your opinion about GMO's. Support your opinion.

The Great GMO Debate

Split the class in $\frac{1}{2}$, facing each other. Present opening arguments, opinions and rebuttals.

- Write a reflection about the GMO debate. State your claim and include evidence for support.
- Evaluate what could have been improved for individuals, or group performance?

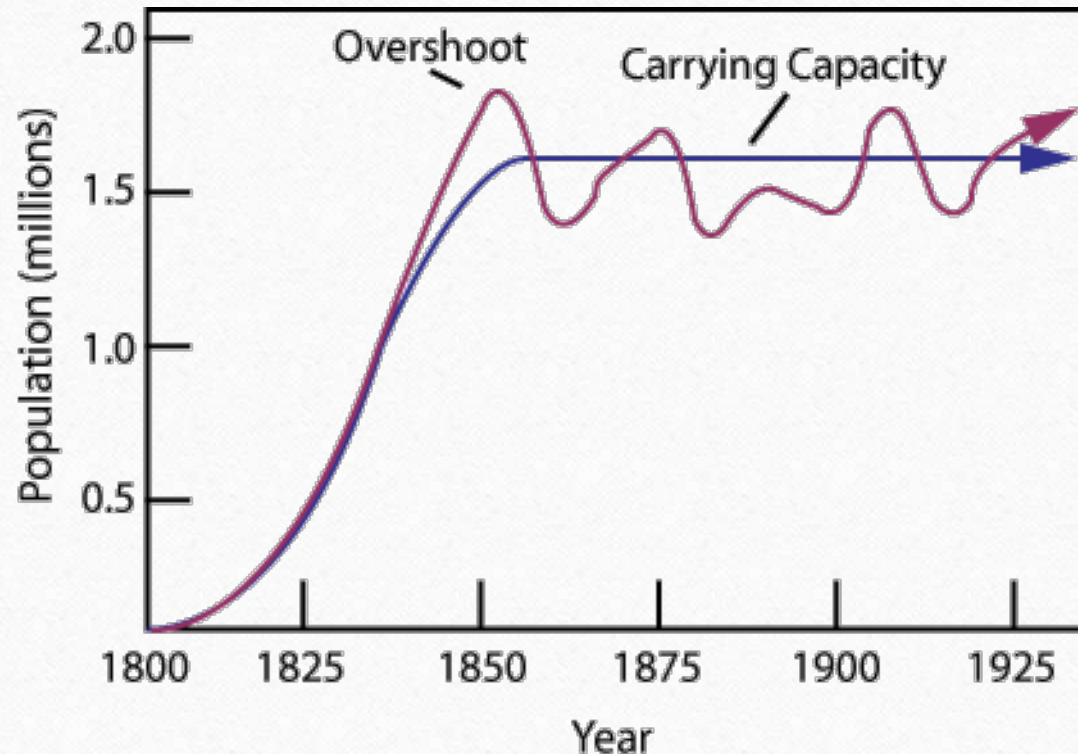
Lesson 4: Populations-People & Carrying Capacity

F2F1 UNIT 4

Global Food

Earth's Carrying Capacity

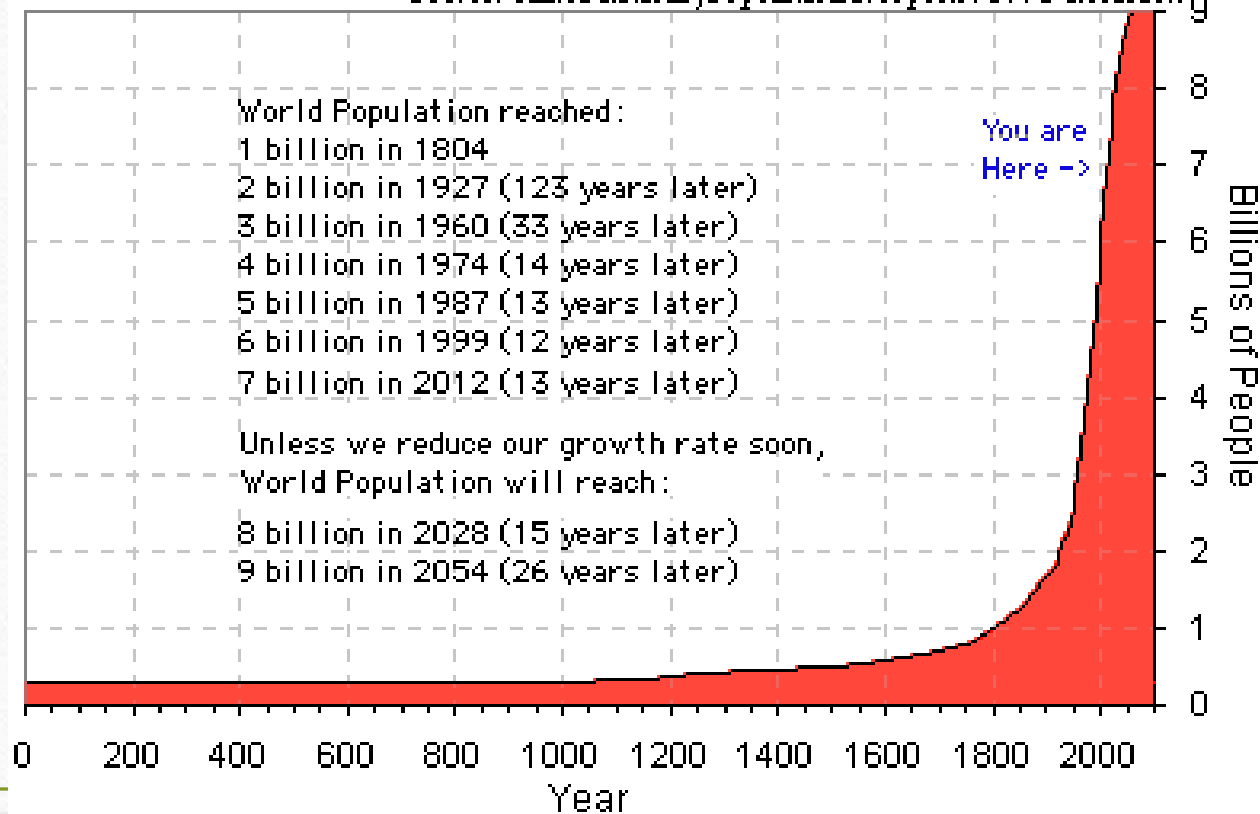
Obj. TSW learn how the increase in world population will have an impact on them.



1. Approximately how many people live in CA?
2. Approximately how many people live in the US?
3. Approximately how many people live on the Planet?

Earth's Human Population Growth

Source: United Nations, Population Prospects: 2004 Revision



Activity: Population Growth Analysis

- Introduction of Reindeer to St. Matthews Island in Alaska.
- Analyze the graph of the growth of Reindeer from the original 29 that were introduced to St. Matthew's Island.
- Answer the 5 Preview questions.
- Answer the analysis questions in complete sentences.
- Finally, is there any relevance between this example of overpopulation and the human population on the Planet? 2 – 3 sentence answer.

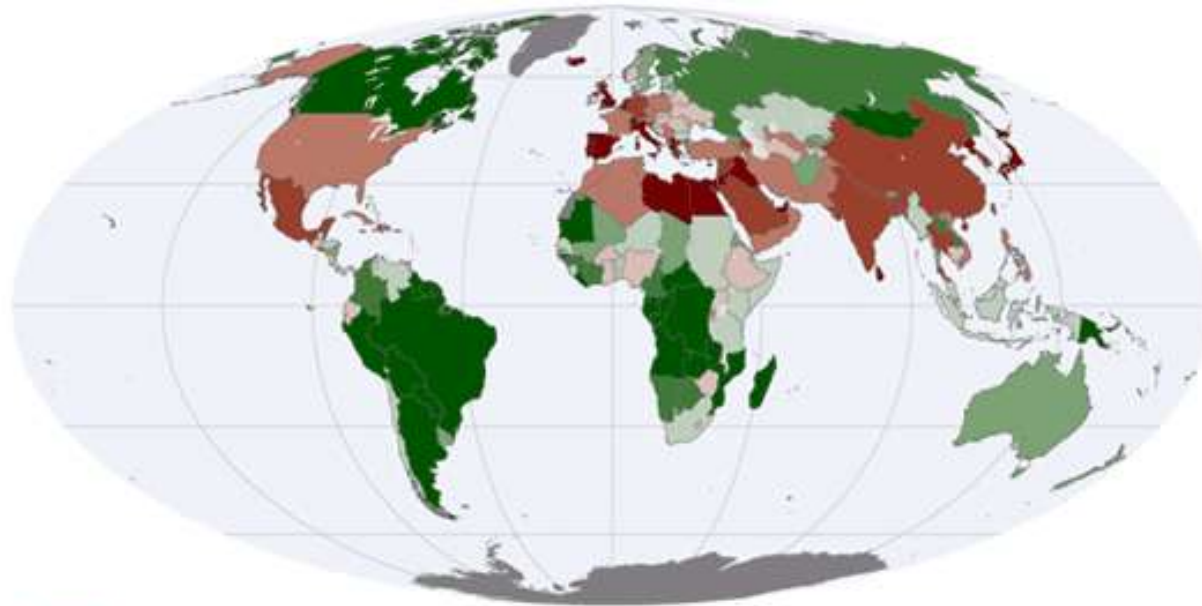
United Nations

Integrating Population Issues into Sustainable Development

- Students research the website:
 - Who are the United Nations?
 - What do they do?
 - How are they part of the solution for sustainable development?

Earth's Carrying Capacity

Obj. TSW understand that Biocapacity of countries and the carrying capacity of the planet are interlinked.



1. What are limiting factors in a Carrying Capacity graph?
2. What are some Density Dependent Factors?
3. What are some Density Independent Factors?

Sustainability Worldwide

Obj. TSW apply and discuss why it is important for sustainable practices to be enforced worldwide.



1. Describe sustainability.
2. Describe 3 sustainable practices you have learned in this class.
3. What are the implications of increased population growth if sustainable practices are not enforced?

Online Article: Has Earth reached its Carrying Capacity?

Maxine Abrulo – Coit Tower

- Answer questions from the WS.

Summative Assessment

- Students should answer the following questions after they have gathered all their research:
- Which of your five foods did you find for sale in other circulars? Why do you think they were for sale in more than one place?
- Which of your 5 foods were more expensive or less expensive? Why do you think that is?
- Notice and write about any trends that developed at certain grocery stores. For example, was the Dollar Store always the cheapest? Why?
- Finally, the class will have a discussion about the supply and demand of food in our grocery markets.
- What drives the economy of food?
- Students will write a reflective 1 page paper summarizing all the activities from this key assignment, tying in the biocapacity of countries, the imports of food from other countries, and changes they may make in their lifestyle as a result.

Sustainability

January 4th From the Soil

Obj. TSW gain a better perspective of the
importance of healthy soil. P. 80 NB



1. What are the components of healthy soil?
2. Why is Farm to Fork important?
3. Explain what you have learned about growing healthy food for RCHS students and Culinary?

Second Barcode

- Take 3 – 4 Notes in the 2 minute video.
- After watching the short video clip, what are your thoughts?
- How realistic is a second barcode?

Activity: The Story of Food

nourish.org

- **Objective:** Students examine food labels and conduct research to trace food paths from the original plant or animal source. They then make posters describing the story of a particular food.
- **Question:** How does the way food is raised, processed, transported, and eaten impact both people and the environment?
- Read the background information.

11/5 Bayer Crop Science

Obj. TSW learn about local companies that play a role in our Agricultural success. p.82 NB



1. What association do you have with Bayer?
2. Why would a Pharmaceutical company get involved with Crops and growing Food?
3. How does what you have learned about Bayer Crop Science underscore the importance to growing healthy food worldwide?

Final Presentation –PPT

Farm to Fork Project PART 2 DUE McAllister needs to review your progress of your project before **January 8TH**.

PPT Individual: 10 – 15 Slides

PPT Two students: 15 – 20 Slides

Introduction: Briefly review your project for us.

Data

- **Qualitative Data:** Words, Descriptions, Pictures, Video
- **Quantitative Data:** Tables, Charts, Graphs

Data Analysis

- What does the data mean?
- What were some things that you learned from mistakes you made?
- What would you do differently next time?

Conclusion

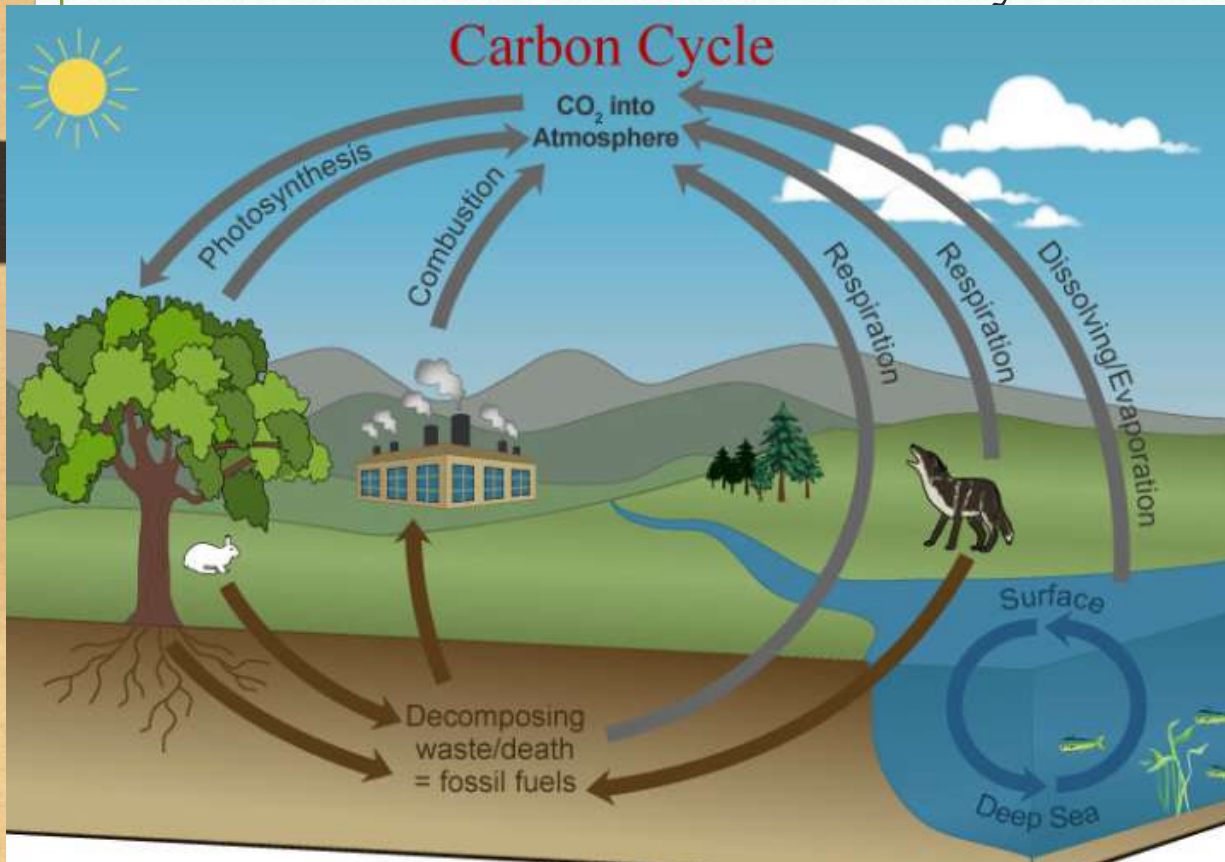
- Explain what your project meant to you and how the class Farm 2 Fork has helped you gain a better understanding of your project/ gardening caring for plants/& or soil . If you were in charge of feeding the world, or creating more sustainable practices worldwide how you would go about it?

• **Works Cited Title. Author. Website link.**

- *Yolo Farm to Fork.* By Dorthy Peterson. Dir. Dominic Machi. Perf. Beth Harrison. *Yolo Farm To Fork.* Yolo Farm to Fork.org, n.d. Web.

Carbon Cycle Review P. 84 NB

Obj TSW review how important the carbon cycle is to us.

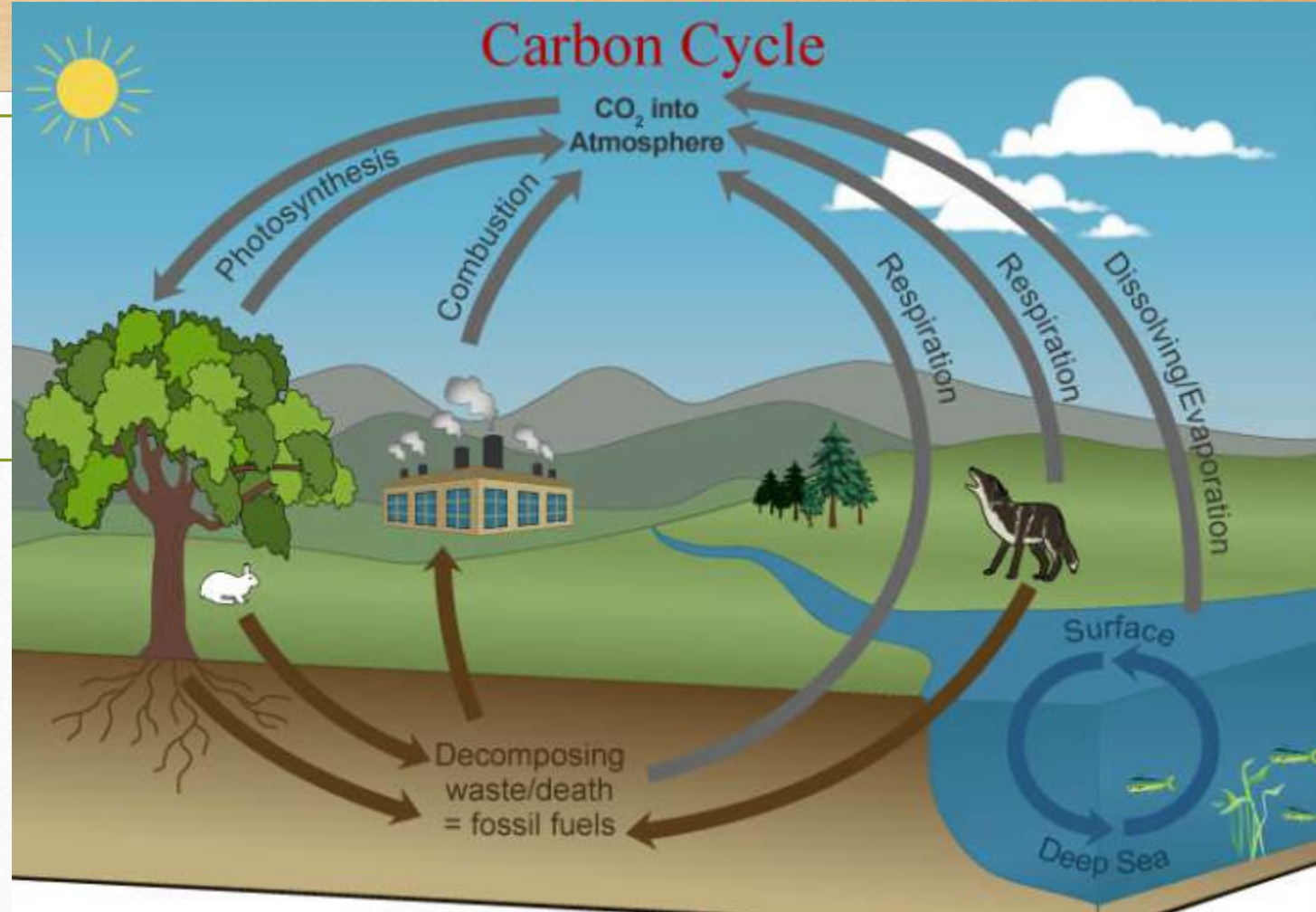


1. What is the Carbon Cycle?
2. How does CO_2 cycle through the Biotic and abiotic factors?
3. List 6 processes of the Carbon cycle.

Greenhouses & Carbon Cycle Activity. p. 85NB

- "What happens to the carbon dioxide you breathe out or the carbon dioxide released from a burning paper?"
- How does the carbon cycle influence the greenhouse effect?
- How do greenhouses utilize the greenhouse effect to promote plant growth?
- How is greenhouse plant cultivation a sustainable practice?

- Students will draw the carbon cycle. Labeling the 6 processes that take place: **Photosynthesis, Cellular Respiration, Exchange, Sedimentation & Burial, Extraction and Combustion.** Students will gain a better understanding of how carbon cycles between the atmosphere, geosphere, hydrosphere, and biosphere from their graphical simulation of the carbon cycle.

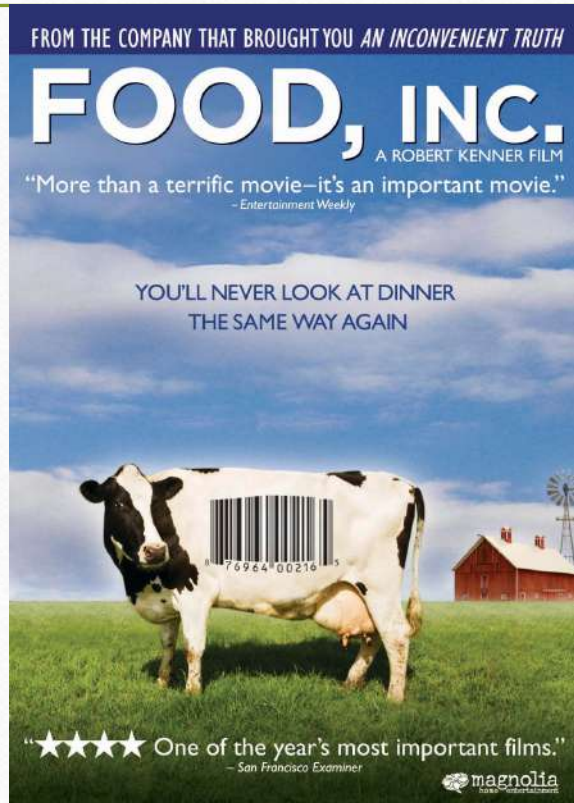


Bayer Crop Science P. 85 NB

- Where is Bayer Crop Science in West Sac?
- What does Bayer Crop Science do concerning agriculture?
- Give 3 examples of how they are involved in agriculture.
- How does it relate to Farm to Fork?

11/8 Food Inc.

Obj. TSW make connections between how food is produced and why Farm to Fork is so important. 86 NB



1. What impression was left on you by the movie Food Inc.?
2. What did you learn from Food Inc. that changes how you think about food?
3. If you got to meet Micheal Pollan in person, what would you like to ask him?

11/12 Nourish.org

Obj. TSW learn p. 88 NB



1. Name three things about the video that you learned.
2. How does Nourish relate to Food Inc. and to Farm to Fork?
3. How has Nourish changed your thinking about food? And what is healthy.

11/13 Understanding where our food comes from

Obj. TSW explain three aspects of how this class has impacted themselves, or the school or the community.

P. 90 NB



1. If someone were to ask you, “What was the Farm to Fork” class like? How would you describe what was taught in the class?

