ELL Chemistry Calendar Weeks 3-5

Monday	Tuesday	Wednesday	Thursday	Friday
5/4 **Finish Assignment #3:** Do Part 4: Explain why Venus is hotter than Earth. *Make sure you draw an excellent cartoon or spend some time working on your paragraph.*	5/5 **Assignment #4** Part 1 Read and annotate the article about the carbon cycle.	5/6 **Assignment #4** Finish reading and annotating part 1 and answer the questions	5/7 **Assignment #4** Do part 2: Solve the puzzle	5/8 **Assignment #4** Part 3: Complete the organizer. *Completed assignments #1,#2 and #3 are due. They should be turned in on Schoology or be returned to school*
5/11 **Start Assignment #5** Read annotate "Reducing Your Carbon Footprint"	5/12 **Assignment #5** Part 1: Finish reading and answer the questions Start Part 2: Work on Solving the Crossword Puzzle	5/13 **Assignment #5** Finish Part 2 and start Part 3 out data in the questionnaire for Part 3	5/14 **Assignment #5** Finish Part 3.	5/15 Finish any remaining work on assignments #4 and #5. *Completed assignments #4 and #5 are due. They should be turned in on Schoology or be returned to school*
5/18 **Assignment #6** Read and annotate the article "Stopping Emissions"	5/19 **Assignment #6** Part 1: Finish reading and answer the questions	5/20 **Assignment #6** Finish Part2 Question 1-3	5/21 **Assignment #6** Part 2 Question 4: Work on your summary paragraph	5/22 **Last Day of School** Call Dr. Libeu and read your summary paragraph into her voicemail.

All students are responsible for completing the work following the assignment schedule. . If you are returning written work, you must drop it off at the school by the collection dates established by the district to receive credit. All online work must be submitted by the collection date as well for students to get credit. All online work may be submitted early to your teacher upon completion of article and workbook.

If you need help or have question

Office Hours: Weekdays 10:30 -11:30am. Zoom tutorials for each lesson will be announced on Schoology and will start at 11:30am. If you are joining the tutorial, the expectation is that you will have completed any reading assignments before 11:30am so that you can participate in the discussion. For individual help: call (209)565-0124 between 2 pm and 3 pm, email cplibeu@tusd.net or message through Schoology. I will be answering emails and messages later in the afternoon.

Remind: I will be sending out zoom invites and other class information using remind. To sign up text @4e2k4kg to the number 81010

To obtain work online: Assignments with downloaded fillable pdfs are posted on Schoology

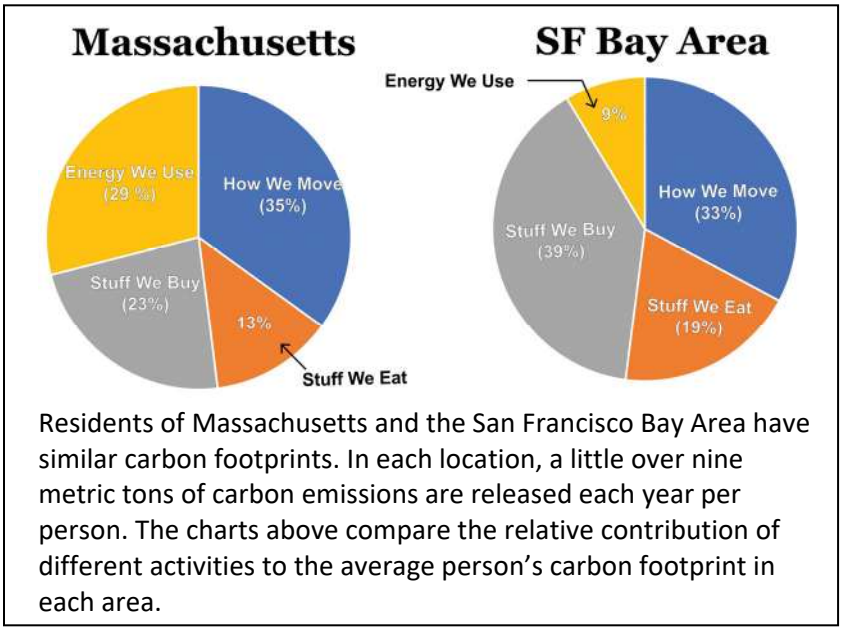
Online Submission of work instructions: Turn in your completed work to Schoology. There are individual assignments for each day. You can turn in either a completed pdf or a photo of your work. For multiple pages, it is easiest to make a video if you are not filling in the pdfs. Your name must be clearly written in ink on each page for the work to be accepted. ***Please do not email me files.***

Reducing Your Carbon Footprint

We constantly hear advertisements telling us to do or buy something that will "save the planet?". But how do we know what choices to make? The carbon footprint is a way to estimate how much carbon will be released into the air by our actions. The carbon footprint measures the carbon emissions created by various human activities. Because of our culture's dependence on fossil fuels for energy, everything that we do impacts the carbon cycle. The carbon footprint is a way to measure that impact.

What is a carbon footprint?

A person's carbon footprint is an estimate of all the carbon emissions created by a person's daily life activities. It is not just the carbon dioxide that a person breathes out though. It also includes the carbon released by the combustion of fossil fuels necessary to make the goods and services used in daily life. The first thing that most people think of that affects their carbon footprint is energy use. But other things are also important. The amount of stuff we buy affects our carbon footprint. The amount of food we eat affects our carbon footprint. How we move around affects our carbon footprint. Do we drive? Do we bicycle? Do we fly.



Residents of Massachusetts and the San Francisco Bay Area have similar carbon footprints. In each location, a little over nine metric tons of carbon emissions are released each year per person. The charts above compare the relative contribution of different activities to the average person's carbon footprint in each area.

For most people in the US, the two largest parts of the carbon footprint are energy use and transportation. The San Francisco Bay Area is an exception because of three factors. First, the Bay Area's climate is relative mild. Residents do not use as much energy to heat or cool their homes as other places. Second, California is not as dependent on combustion of fossil fuels to generate electricity as other states. Therefore, the electricity that residents use is less likely to be produced using fossil fuels. Third, California has a strong government programs that encourage residents to use energy-saving technologies in their homes and offices

Carbon Emissions We Can Not Control

There are two types of contributions to one's carbon footprint. Some contributions like how much food we chose to eat or how much stuff we choose to buy are in our direct control. But much of the carbon emitted on our behalf is not. For example, how electricity is generated

makes a big difference in the carbon footprint. In some states like West Virginia, electricity is generated almost entirely through the burning of coal. Seventy-two percent of the state's carbon footprint comes from the generation of electricity. Other states use predominately renewable sources of electric power. For example, most of the electric power in Washington state comes from hydroelectric dams. Only 12% of the Washington's carbon footprint is due to the generation of electricity. Washington state produce so much electricity that they sell electricity to other states including California.

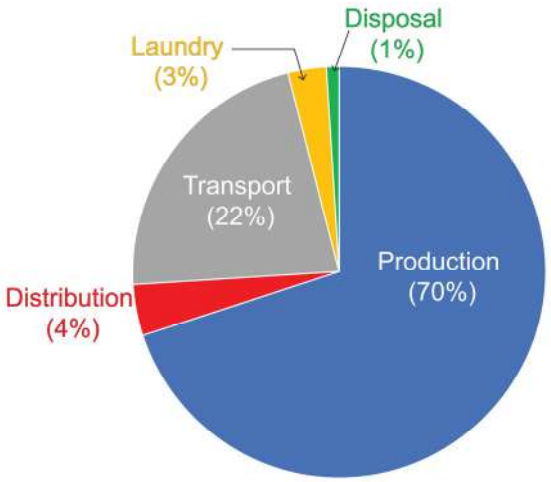
To reduce the carbon footprint of electrical generation depends on decisions made on the industry and government. The United States has made these decisions before. The large hydroelectric dams in Washington State and the southwestern United States were built by the federal government in the early part of the twentieth century. For example, California gets 11% of its electricity from hydroelectric dams mostly in other states. This electricity is available because of decisions made by the federal government in the 1920s and 1930s.

Similarly, the state and local governments in California have invested in the development of sources of hydroelectric, geothermal, solar and wind energy inside the state. Because of these investments, forty percent of California's electricity is produced without using fossil fuels. California has an ambitious goal of carbon-neutral electricity generation by 2045. Carbon-neutral means that the state would produce all its electricity with technologies that do not add extra carbon emissions to the atmosphere.

Hidden Carbon Emissions

Individuals can make choices to reduce their carbon footprint by focusing on things that they buy, but it is difficult. Most of the carbon emissions are hidden in the processes used to produce goods and food.

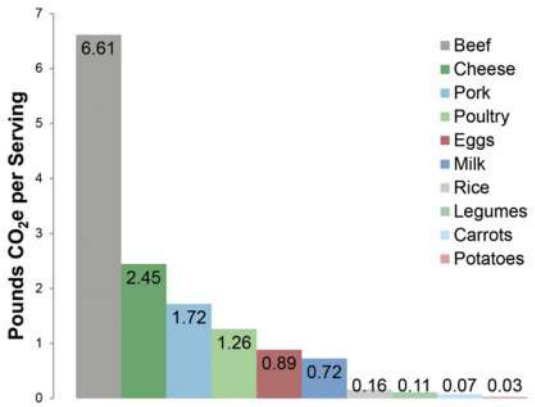
For example, most of the carbon emissions released by the production of a t-shirt are not in the sewing or distribution of the t-shirt to the stores. Not in the amount of energy needed to wash and dry the t-shirt after it has been purchased. The big source of carbon emissions for cotton fabrics is the need for water. Water is needed to grow the cotton. Water is needed to dye the fabric and prepare it for sewing. Water is also needed to wash the t-shirts before they



Carbon footprint of a t-shirt. Most of the carbon footprint of a t-shirt is the carbon emission produced growing the cotton and making the fabric. For more information check out: https://www.smithsonianmag.com/innovation/whats-environmental-footprint-t-shirt-180962885/

are packed for delivery to the stores. To move water from one place to another takes electricity. In California, twenty percent of all electricity in the state is used to move water. Some of the water comes to homes, but most of the water is delivered to factories and farms.

The other hidden source of carbon emissions is transportation. Cotton is grown in one place. It is made into fabric in a second place. The fabric is sewn into t-shirts in a third place. Finally, the t-shirt is bought in a fourth place. These places may be on different sides of the world. Cotton grown in California may have traveled all the way around the world before it made it back to a store in California as a t-shirt. These hidden carbon emissions are why, the "Things We Buy" part of the footprint is so large.



A comparison of the pounds of carbon dioxide emitted into the atmosphere during the production of different types of food.

Choices

Obviously as an individual, we can't control how the t-shirts that we buy are made. But the comparison between the carbon footprints of residents of Massachusetts and California is shows us something about how people think. Did you notice that when the "Energy We Use" went down, the "Stuff We Buy" went up? Californians do not have to spend as much money on energy, so they spend more money on stuff.

In Western countries, clothing is the next biggest part of the carbon footprint after electricity generation and transportation. It really does matter how much we chose to buy. Studies have shown that buying quality clothes that last longer can have a big impact on an individual's carbon footprint. The global fashion industry contributes about 10% of the world's excess carbon emissions. Most of the excess carbon is generated from clothes that are worn once or twice and then discarded. Buying used clothing or trading clothes with someone else is a great way to reduce one's carbon footprint.

The fourth largest contributor to the carbon footprint is food. Like clothing, choices about food can have a big impact. Production of one serving of beef for example releases almost four times as much carbon dioxide as a serving of pork or chicken. Therefore, eating less beef can reduce one's carbon footprint. Wasting food also contributes to the carbon footprint. Stopping food waste could eliminate as much as 11% of the world's carbon emissions.

These statistics show that individuals can change their behavior to have a big impact on carbon emissions. It is ironic. We are constantly told to buy things " to save the planet". However, the most efficient way for individuals to reduce their carbon footprint may be to simply be careful about what they buy. Buying only what you need saves both carbon and money.

 Name:

Do Parts 1-3 after you read the article "Reducing Your Carbon Footprint"!

Part 1: Read the article "Reducing Your Carbon Footprint" and answer the following questions after you read the article.

During your first reading you should annotate the text using the instructions in your planner.

Box words you don't know.
Circle key terms, relevent names, dates places.
Put a ? mark by anything that is you have a question about or that is confusing.
Put an ! mark next to interesting or surprising information.
Highlight the author's claims/arguments/points and supporting evidence

Online TIP: If you working in adobe acrobat reader on your phone, tap the pencil icon and will open a menu that will allow you to highlight and draw on the document.

1. List key terms from the article that you didn't know before and explain their meaning in your own words.
   Key term 1:_____

   Key term 2:_____

   Key term 3:_____

2. List two things that surprised you when you read the article
   Surprise 1: _____

   Surprise 2: _____

3. What is one interesting thing that learned when you read the article.

Read the article a second time and then use what you learned from the article to complete the sentences below.

Word Bank: buy, carbon, combustion, dioxide, eat, emissions, energy, footprint, production, stuff, transportation, use, waste, water (words can be used more than once)

1. **From <u>What is a carbon footprint</u>.**

   The carbon _____ measure the carbon _____ from human activities. Carbon _____ are the carbon-containing molecules

released into the atmosphere. The release of _____ _____ is an example of a carbon emission.

The biggest differences between the carbon footprint of a person who lives in Massachusetts and a person who lives in the SF Bay Area is in the _____ we _____ and the _____ we _____.

2. **From <u>Hidden Carbon Emissions</u>**

The largest amount of carbon emissions in the carbon footprint of a t-shirts is during the _____ of the t-shirt. These emissions happen because a large amount of _____ is needed to make a t-shirt. _____ also contributes to the carbon footprint. In both cases, the energy needed to move the _____ or the t-shirt comes from the _____ of fossil fuels.

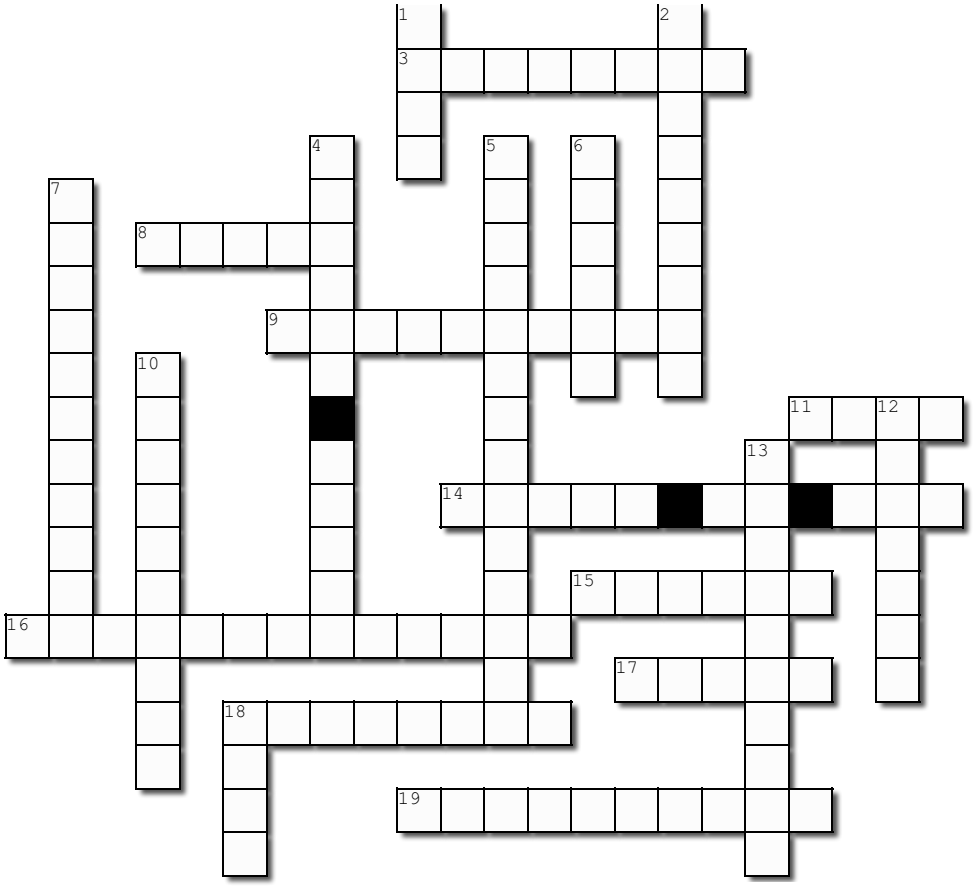
3. **From Choices**

For most individuals, the easiest part of the carbon footprint is the "_____ we _____" or the "_____ we _____". By buying less _____ or choosing to eat different _____, an individual can change their carbon footprint. Another strategy would be to reduce _____.

 Name: _____

Reducing Your Carbon Footprint

Part 2: *Use the information in the "Reducing Your Carbon Footprint" Article to help you solve the puzzle.*



fossil	hidden	emission	carbon cycle	generation	coal	stuff we buy	beef	hydroelectric	clothing
production	footprint	combustion	geothermal	transportation	water	electricity	neutral	solar	wind

Across

3. The act of releasing or the amount of something that is released

8. Twenty percent of the electricity in Califonia is used to move _____.

9. The chemical reaction that 'burns' coal, oil and natural gas

11. Energy from the movement of air

14. The biggest part of the carbon footprint of a person living in the SF Bay Area

15. Part of the carbon footprint the individuals can't change

16. Electricity creating using dams

17. Energy from the sun

18. The product of the fashion industry

19. The biggest part of the carbon footprint of a t-shirt

Down

1. The food with the most carbon dioxide released per serving

2. The carbon _____ measures how much carbon is released.

4. How carbon moves between the atmosphere and the various carbon sinks

5. An activity that moves people and goods from one place to another

6. Fuels made from ancient plants

7. Use to power many devices

10. Energy from heat within the earth

12. When the amount of carbon entering and leaving atmosphere is the same, the process is carbon ____.

13. The process of creating something new

18. Burned to generate most of the electricity in West Virginia

Part 3: How Did Your Carbon Footprint Change ?

Use the calculator as a way to think about how your carbon footprint changed because of the corona virus.

Talk to whoever pays the bills in your household to get estimates for how much your household spent on different items before the shutdown and after. It is OK to estimate. You do not need exact numbers. You just want to use reasonable numbers to see if there is a difference.

For some questions you will have to think about how things might change for your household in the coming year. We will be doing the calculation assuming that we sheltered for one year and that the last month is a typical month. Make your best guess as to what you think might happen.

Household

Before *After*

1. How many people live in your home? _____ _____

2. What is your zip code? _____
3. What is your households approximate yearly household income?

Before *After*

_____ _____

Energy

4. How much natural gas does your household use per month?

(Use your monthly consumption in thousands of cubic feet, for a more accurate estimate)

Before *After*

_____ dollars per month _____ dollars per month

_____dollars per year _____ dollars per year

5. How much electricity does your household use per month? (Use average kilowatt-hours, for a more accurate estimate.)

Before *After*

_____ dollars per month _____ dollars per month

_____dollars per year _____dollars per year

The calculator uses yearly use for the energy numbers so you will need to multiply your numbers by 12 before you put them into the calculator.

6. How much other types of fuel for example propane does your household use per month?

Before	*After*
_____ dollars per month	_____ dollars
_____ dollare per year	_____ dollars per year

7. How much water does your household use per month?

Before	*After*
_____ dollars per month	_____ dollars per month
_____ dollars per year	_____ dollars per year

Transportation

8. For each vehicle answer fill in the information to complete the table below: On average, how many miles do you put on each vehicle per week?

What is the average gas mileage (miles per gallon)?

Before

	Miles/Week	Mileage
Vehicle 1		
Vehicle 2		
Vehicle 3		
Vehicle 4		
Vehicle 5		

After

Miles/Week	Mileage

9. How far does your family travel by public transportation (bus, train ....) each week? (check one)

Before	*After*
◯ 0 miles	◯ 0 miles
◯ 1-5 miles	◯ 1-5 miles
◯ 5-25 miles	◯ 5-25 miles
◯ 25-50 miles	◯ 25-50 miles
◯ 50 or more miles	◯ 50 or more miles

You will need to put miles per year into the calculator. Multiply by 52 to convert to miles per year.

10. How many miles does your family fly each year?

Before *After*

_____ miles _____ miles

Hint: Think about whether the corono virus will change whether you fly in the coming year.

Food

11. On a typical day how many servings of each food do you eat?

Before

Beef/Lamb/Pork/Veal (1 serving =3 oz or the size of a deck of cards):
_____ servings x 300 = _____ calories

Fish and Seafood (1 serving =3 oz or the size of a deck of cards):
_____ servings x 100 = _____ calories

Chicken and Eggs (1 serving =3 oz or the size of a deck of cards or 1 egg):
_____ chicken servings x 200 = _____ calories
_____ egg servings x 80 = _____calories
_____total calories

Grains and Baked Goods (1 serving =0.5 cup grains (rice, pasta, ...) or 1 slice of bread):
_____ servings x 200 = _____ calories

Dairy (1 serving = 1 cup milk or yogurt, 1 oz of cheese):
_____ servings x 100 = _____ calories

Fruits and Vegetables (1 serving = 1 cup vegetables or 1 piece of fruit):
_____ servings x 50 = _____ calories

Snacks and Drinks (1 oz chips, 8 oz of sodas, 3 small cookies.....):
_____ servings x 100 = _____ calories

After

Beef/Lamb/Pork/Veal (1 serving =3 oz or the size of a deck of cards):
_____ servings x 300 = _____ calories

Fish and Seafood (1 serving =3 oz or the size of a deck of cards):
_____ servings x 100 = _____ calories

Chicken and Eggs (1 serving =3 oz or the size of a deck of cards or 1 egg):
_____ chicken servings x 200 = _____ calories
_____ egg servings x 80 = _____calories
_____total calories

Grains and Baked Goods (1 serving =0.5 cup grains (rice, pasta, ...) or 1 slice of bread):
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Fruits and Vegetables (1 serving = 1 cup vegetables or 1 piece of fruit):
_____ servings x 50 = _____ calories

Snacks and Drinks (1 oz chips, 8 oz of sodas, 3 small cookies.....):
_____ servings x 100 = _____ calories

How much stuff do you buy?

Think about how the corono virus might change your households spending over the next year.

12. How much did you spend on goods each month?
Goods are physical things that you buy: clothes, electronics, furniture, cars.....

Before *After*

_____ _____

13. How much did you spend on goods each month?
Goods are physical things that you buy: clothes, electronics, furniture, cars.....

Before	*After*
_____	_____

Putting all the information together.

Use the website below to calculate your household's carbon footprint before and after the corona virus shutdown. If you can not access the internet you can answer the questions by comparing your before and after answers.

https://www.nature.org/en-us/get-involved/how-to-help/carbon-footprint-calculator/

1. (If you have access to the internet) What is your household's carbon footprint estimate footprint before the shutdown? What was your household's estimated carbon footprint after the shutdown? How did they compare to the average?

2. In what categories did you see the biggest changes?

3. List three things that you and your family can do to reduce the carbon footprint of your household.

   1. _____
   2. _____
   3. _____

Ashley Olinger

4. How do we stop fossil fuel emissions?

By Brad Plumer, a climate reporter specializing in policy and technology efforts to cut carbon dioxide emissions.

Adapted From: New York Times April 19,2020

To stop global warming, we will need to stop greenhouse gas emissions from billions of different sources worldwide. Every coal plant in China is part of the problem. Every steel mill in Europe is part of the problem. Every car and truck on American highways are part of the problem. It is such an enormous task that it can be tough to figure out where to begin.

I am a reporter. I have spoken to experts and read dense reports about how countries can slash their emissions. There's often fierce debate over the best path forward. But I have found it helpful to think what all the different proposals have in common. They essentially recommend four broad steps. Consider them a rough game plan for how the world might solve climate change.

Clean up electric power plants

Today, roughly one-quarter of humanity's emissions come from power plants generating electricity. Most power plants still burn coal, natural gas or oil. They produce carbon dioxide that heats the planet.

The good news is there are lots of available technologies that can produce electricity without emissions. France cleaned up its grid with nuclear power. California is aiming for zero-emissions

electricity by 2045 by installing solar panels and wind turbines. Some companies plan to capture carbon dioxide from existing coal plants and bury it underground.

Experts often disagree on which technologies are best. Many technical problems need to be solved before cutting emissions to zero. For example, better batteries to store wind and solar power would help. But there's broad agreement that we could greatly reduce power-plant emissions with the tools we have today.

Electrify much of our economy.

Developing green power plants would allow us to change big chunks of our economy. We could use clean electricity instead of burning fossil fuels.

For example, we can replace cars that run on gasoline with electric vehicles. We can replace gas-burning furnaces with electric heat pumps. Instead of steel mills that burn coal, we can use electric furnaces that melt scrap metal. Roughly another one-quarter of global emissions could be avoided by electrification.

Reducing our energy use would make changing to electric power easier. We could save energy by making cities less dependent on cars, upgrading home insulation and increasing energy-efficiency in factories.

Develop new technology for the hard-to-electrify parts of our economy.

Parts of the modern economy cannot easily be electrified. Batteries are still too heavy for most airplanes or long-haul trucks. Many key industries, like cement or glass, require extreme heat generated by burning coal or gas.

One recent study concluded that about one-quarter of emissions fall into this "difficult to electrify" category. Governments and businesses will need to invest in new technologies. We will have to get creative.

Fix farming

A final one-fourth of global emissions comes from agriculture and deforestation. Think cows belching up methane. Farmers clearing rainforests for cropland. Figuring out how to feed billions while using less land and producing fewer emissions is difficult. It will take a lot of different solutions. For example, ranching practices could be improved. Food waste could be reduced. More than one percent of the world's energy is used to provide fertilizer for crops.

This list is simplified. Figuring out how to achieve these four steps is the hard part. A tax on carbon emissions could give businesses incentive to find fixes. Governments could ramp up spending on clean technologies. International cooperation and policies to help dislocated workers are vital. Powerful industry interests who prefer the status quo will fight major change. These changes are basic road map if we want to reduce emissions. However, scientists agree that what is needed to keep the world from heating up endlessly.

Part 1: Read the article "How do We Stop Fossil Fuel Emissions" and answer the following questions after you read the article.

During your first reading you should annotate the text using the instructions in your planner.

Box words you do not know.
Circle key terms, relevent names, dates places.
Put a ? mark by anything that is you have a question about or that is confusing.
Put an ! mark next to interesting or surprising information.
Highlight the author's claims/arguments/points and supporting evidence

Online TIP: If you are working in adobe acrobat reader on your phone, tap the pencil icon and will open a menu that will allow you to highlight and draw on the document.

1. List key terms from the article that you did not know before and explain their meaning in your own words.
   Key term 1:_____

   Key term 2:_____

   Key term 3:_____

2. List two things that surprised you when you read the article
   Surprise 1: _____

   Surprise 2: _____

3. What is one interesting thing that learned when you read the article.

Part 2: Read the article a second time and then use what you learned from the article to complete the sentences below.

1. **How did the author learn about the source of fossil fuel emissions?**

2. **What does the author claim that we need to do to reduce global emissions?**

(For each action that he suggests that we should take. You should identify a piece of evidence that the author uses to support his claim.)

1.

2.

3.

4.

3. **What do you think? Do you agree with his suggestions? Do you disagree?**

4. **Think about all the material that you have learned in assignments 1-6. Write at least 5 sentences about what you learned and how your understanding of climate change has changed over the last five weeks.** When you are happy with what you wrote, please call me and leave a voice message at (209) 565-0124.I am looking forward to hearing your thoughts.