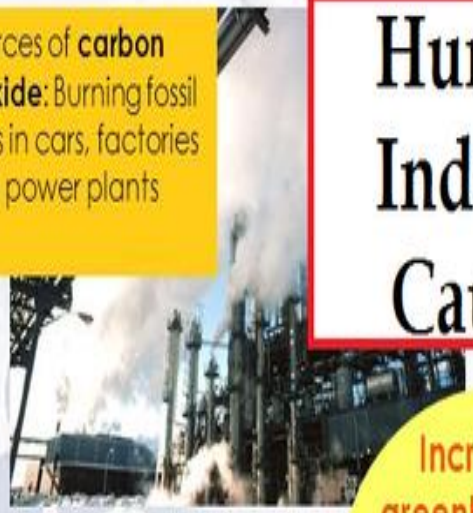
6.E.2A.2 Scientific Argument: Claim, Evidence, Reasoning

Human Induced Causes

Sources of **carbon dioxide**: Burning fossil fuels in cars, factories and power plants



Sources of **nitrous oxides**: Vehicle exhaust pipes, fertilisers, livestock wastes

Increase in greenhouse gas emissions due to human activities

Sources of **CFCs**: Aerosol cans, air-conditioners, refrigerators, plastic forms

Sources of **methane**: Landfills, rice paddies, guts of cattle

versus

Naturally Induced Causes

6.E.2A.2 Scientific Argument: Claim, Evidence, Reasoning

What is a claim?

The answer to the original research question. What you found out from the experiment.

Claim Tips/Tricks:

- Use your science vocabulary from the question.
- Avoid the word "it".

Usually a one sentence long statement!

Claim Examples:

- All trees change colors in the fall.
- Objects with densities lower than that of water will float.
- Sugar and salt are different substances.
- All animals can swim.
- Lowered concentration of sunlight causes changes in seasons.

6.E.2A.2 Scientific Argument: Claim, Evidence, Reasoning

What is evidence?

Scientific data that supports the claim. The data needs to be suitable and sufficient to support the claim. Evidence is not an opinion. Not all data is considered relevant evidence.

Evidence Tips/Tricks:

- Cite qualitative/quantitative data
- Qual-"L" for LOOK with senses
- Quan-"N" for NUMBERS
- Include multiple pieces of evidence to support the claim.

Info gleaned from Graphs/Charts & Illustrations!

Evidence Examples:

- Maple and oak leaves change color in the fall from green to orange and red. Pine trees are green in the summer and green in the fall and winter.
- Water had a density of 1 g/cm$_3$. Oak had a density of 0.85 g/cm$_3$ and floated. Ice had a density of 0.91 g/cm$_3$ and floated. Aluminum had a density of 2.7 g/cm$_3$ and it sank. PVC had a density of 1.3 g/cm$_3$ and it sank as well.

6.E.2A.2 Scientific Argument: Claim, Evidence, Reasoning

What is reasoning?

Justification that connects the evidence to the claim.

Reasoning Tips/Tricks:

- It shows why the data counts as evidence by using relevant science concepts scientific principles and methods of causation.
- Illustrates understanding of the 'big picture' and the mechanism for cause effect relationship
- Incorporates background knowledge, makes connections to concepts studied in class to draw conclusions.

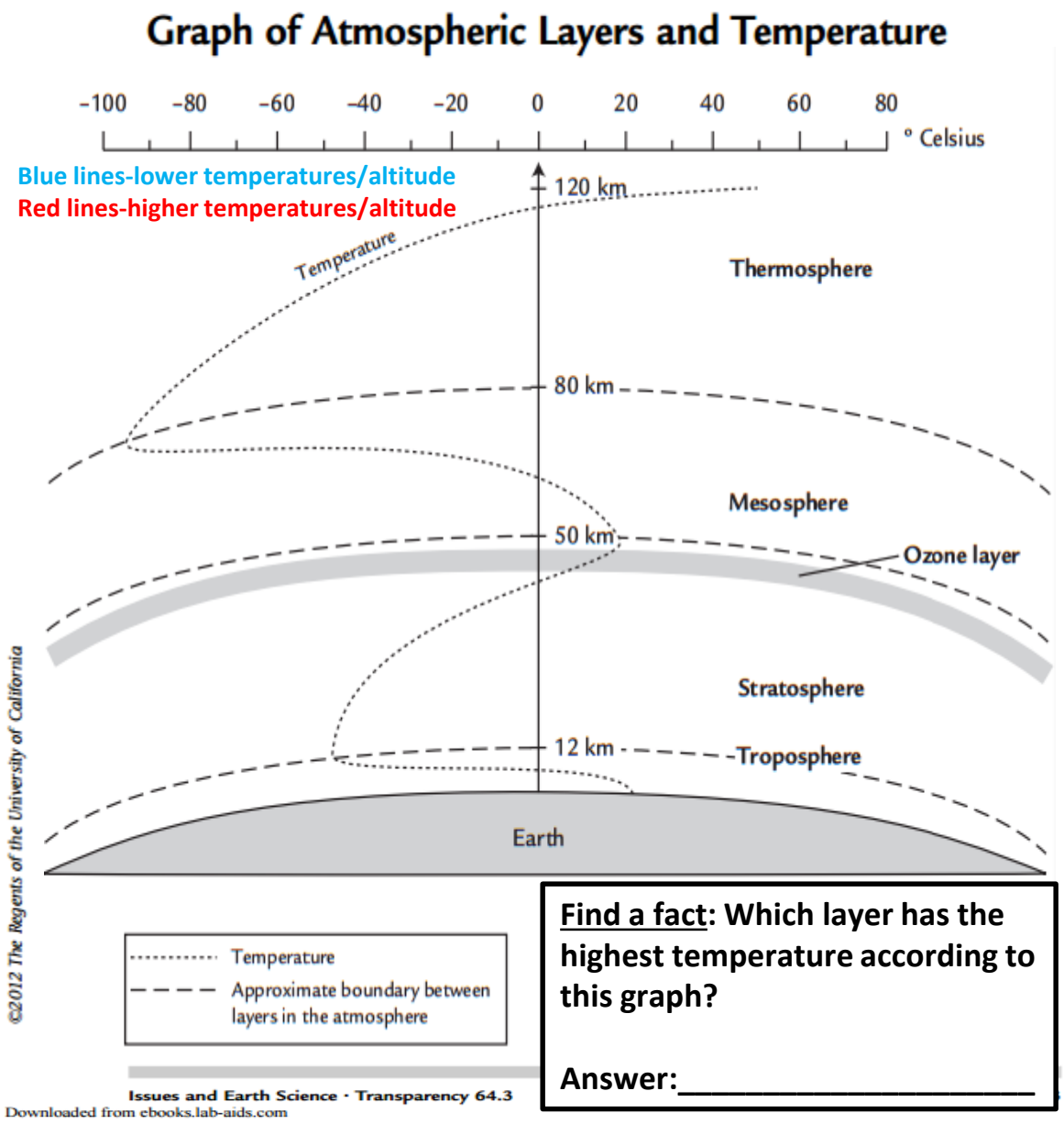
Make connections & draw conclusions!

Reasoning Examples:

Leaves change color due to changes in the seasons. In the fall, days grow shorter, and with that light exposure shortens too. So leaves are not able to make as much chlorophyll, which gives them their green color. When the amount of chlorophyll lessens, the leaves reveal other colors that we cannot normally see, but are there year round. Basically, in the summer the great amount of green chlorophyll obscures the small amounts of other colors in the leaves.

Activity #1 Scientific Argument: Claim, Evidence, Reasoning

6.E.2A.2



Find a fact: Which layer has the highest temperature according to this graph?

Answer:_____

Using the graph, use your scientific argument skills to make a claim, find evidence and reasoning about temperature trends in the layers in relation to altitude.

Claim:_____

_____

Evidence:

_____

_____

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Reasoning:

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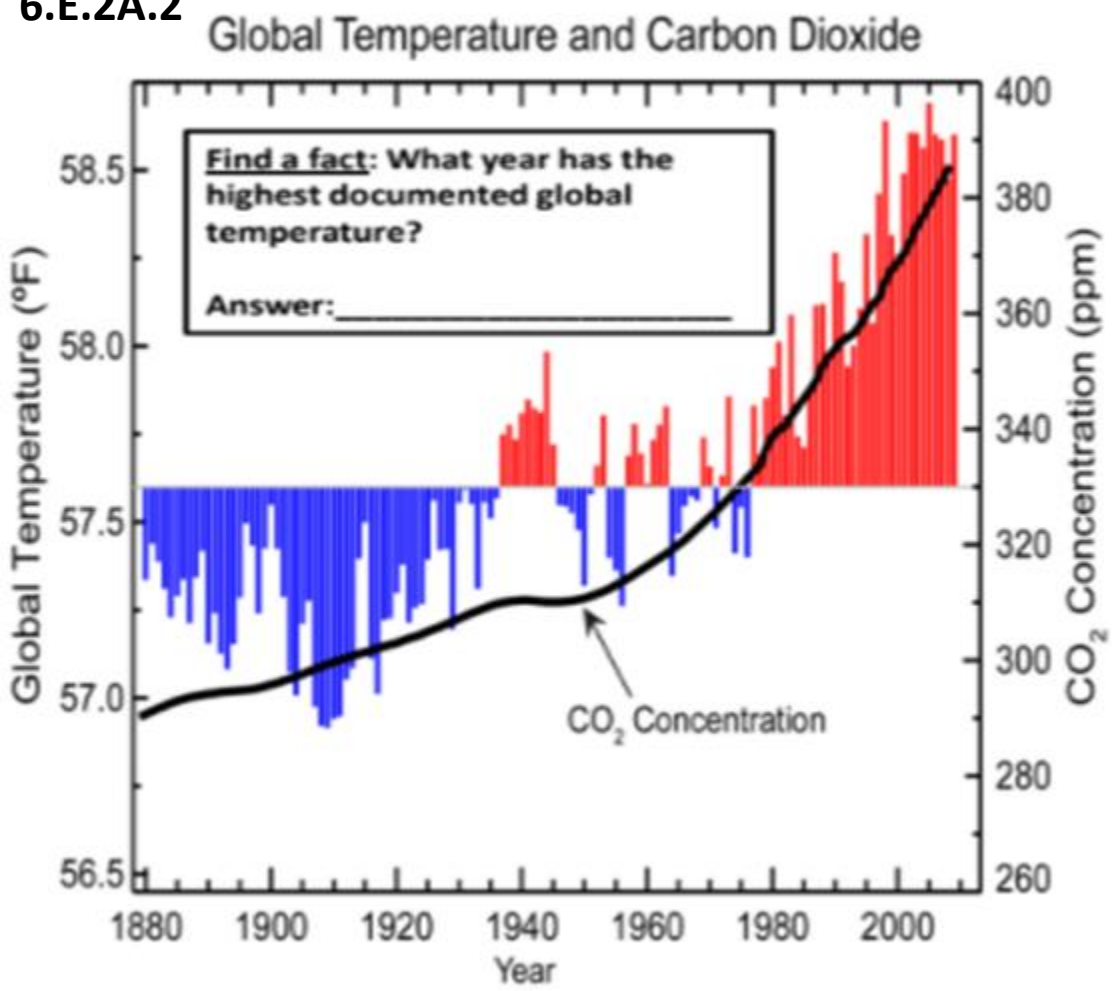
Activity #2 Scientific Argument: Claim, Evidence, Reasoning

6.E.2A.2



Find a fact: What year has the highest documented global temperature?

Answer:_____

Using the graph, use your scientific argument skills to make a claim, find evidence and reasoning about temperature change regarding carbon dioxide and global temperature in the atmosphere and how human activity may have caused the change.

Claim:_____

_____

Evidence:

_____

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_____

_____

Reasoning:

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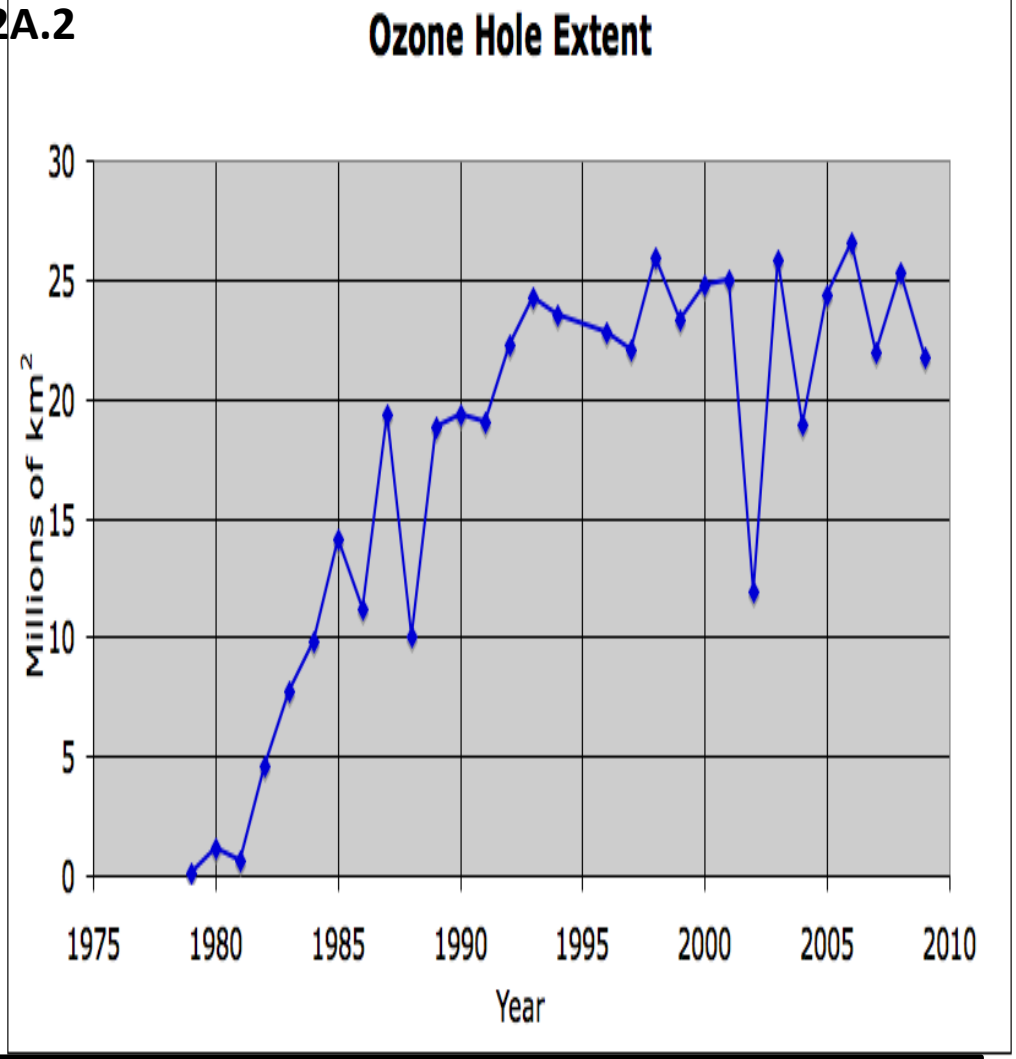
_____

Activity #3 Scientific Argument: Claim, Evidence, Reasoning

6.E.2A.2

CFC's



Find a fact: Which year did the Ozone hole appear the smallest in km2?

Answer:_____

Using the graph, use your scientific argument skills to make a claim, find evidence and reasoning about the use of aerosol sprays and the size of the ozone hole and how human activity may have caused the change.

Claim:_____

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Evidence:

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Reasoning:

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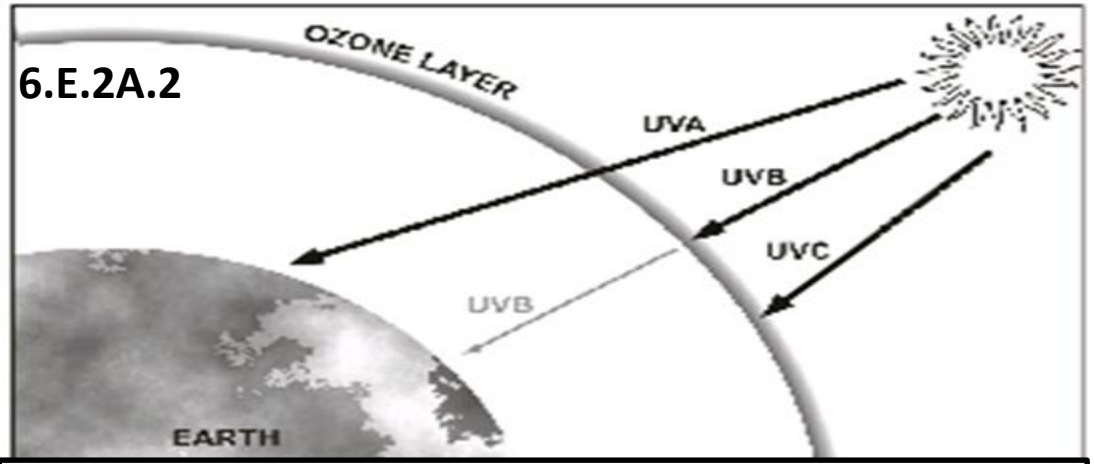
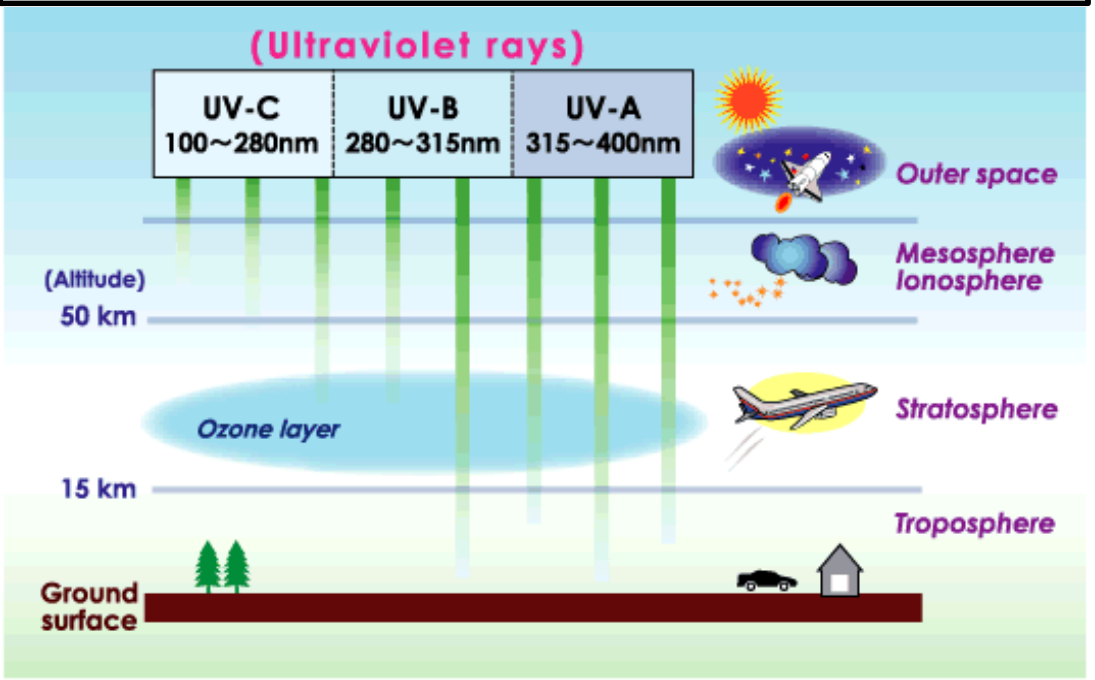
Activity #4 Scientific Argument: Claim, Evidence, Reasoning



<u>Find a fact</u>: **Which type of UV Radiation comes through the Ozone the most?**
Answer:_____



Using the illustration and graph below, use your scientific argument skills to make a claim, find evidence and reasoning about temperature change regarding use of aerosol sprays and effect on the size of the ozone hole in regards to UV radiation.

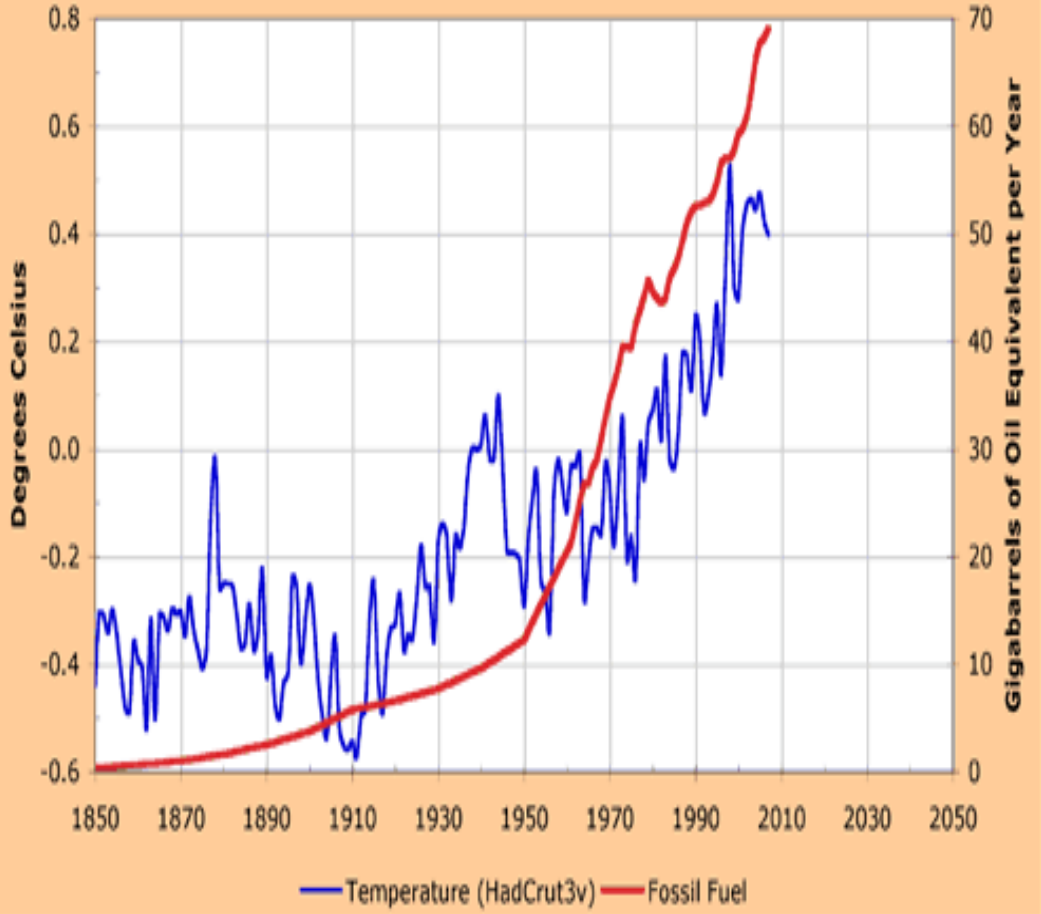
Claim:_____
_____

Evidence:
_____
_____
_____
_____
_____

Reasoning:
_____
_____
_____

Activity #5 Scientific Argument: Claim, Evidence, Reasoning

6.E.2A.2 **Global Mean Temperature & Fossil Fuel Use**



Find a fact: **Which year was the fossil fuel use the greatest?**
Answer:_____

Using the illustration and graph below, use your scientific argument skills to make a claim, find evidence and reasoning about temperature change regarding fossil fuel use how human activity may have caused the change.

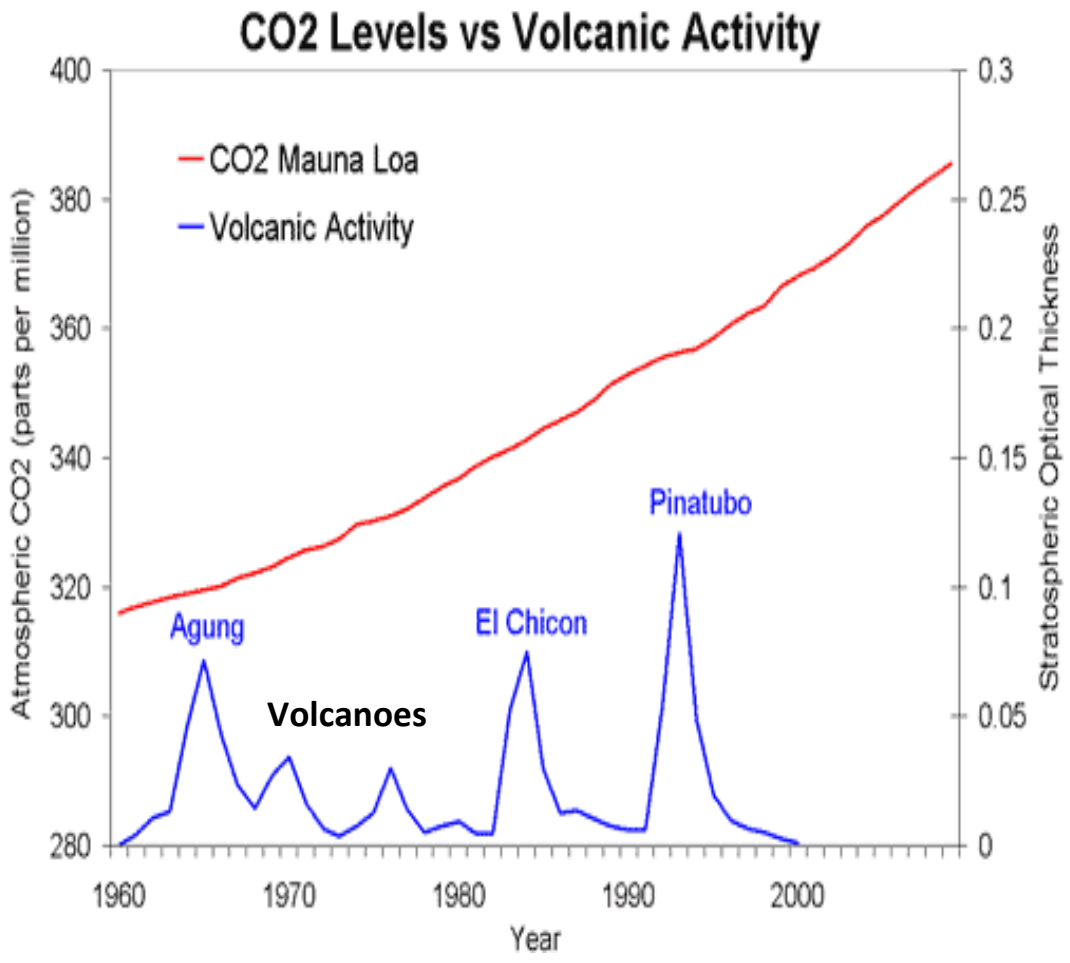
Claim:_____
_____

Evidence:
_____
_____
_____
_____

Reasoning:
_____
_____
_____
_____

Activity #6 Scientific Argument: Claim, Evidence, Reasoning

6.E.2A.2



Using the illustration and graph below, use your scientific argument skills to make a claim, find evidence and reasoning regarding volcanic activity and CO_2 levels and how natural occurring activity has caused the change.

Claim:_____

_____

Evidence:

_____

_____

_____

_____

Reasoning:

_____

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_____

_____

<u>Find a fact</u>: Which volcanic eruption had the largest output of CO_2?
Answer:_____