

Causes and Effects of Climate Change



What we know about climate change

1. Climate is changing -

- *It's happening, right here, right now*

2. Humans are responsible

- *We're causing it*
- *Scientists agree about this*

3. Impacts are serious and already visible

- *We can't wait (if things continue on with business as usual, we're locked in on a certain trajectory)*

4. We can do something about it and we need to act now

- *We can fix it.*

Table Talk: Discuss 4 points

- What do you think each of the points mean?
- What evidence have we gathered that supports these points?
- What questions arise for you?

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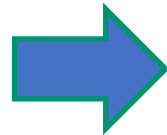
Think Pair Share *plus two*

1. Join a group of 3, and spend about two minutes individually recording your ideas about the following prompts:
 - *List all the global effects of increasing atmospheric CO₂ that you can think of.*
 - *Pick 2 and briefly describe why you think these are important to learn about.*
2. Pass your paper to the person in your group sitting to your left.
3. Review the ideas from your peer and add at least one idea and one comment to their paper.
4. When ready, repeat by passing the paper to your left again and adding one idea and one comment to your peer's paper.
5. When ready, pass the paper back to the originator.
6. Discuss the ideas with your small group – compare and contrast your lists and ideas about what is important for your students to learn.
7. Consolidate your lists and be ready to share whole group.

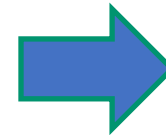
Causes and Effects of Climate Change

Using your list of effects of increasing CO₂ and climate change, work with your table group to build a cause and effect flow chart.

Burning of fossil fuels is increasing CO₂ in the atmosphere



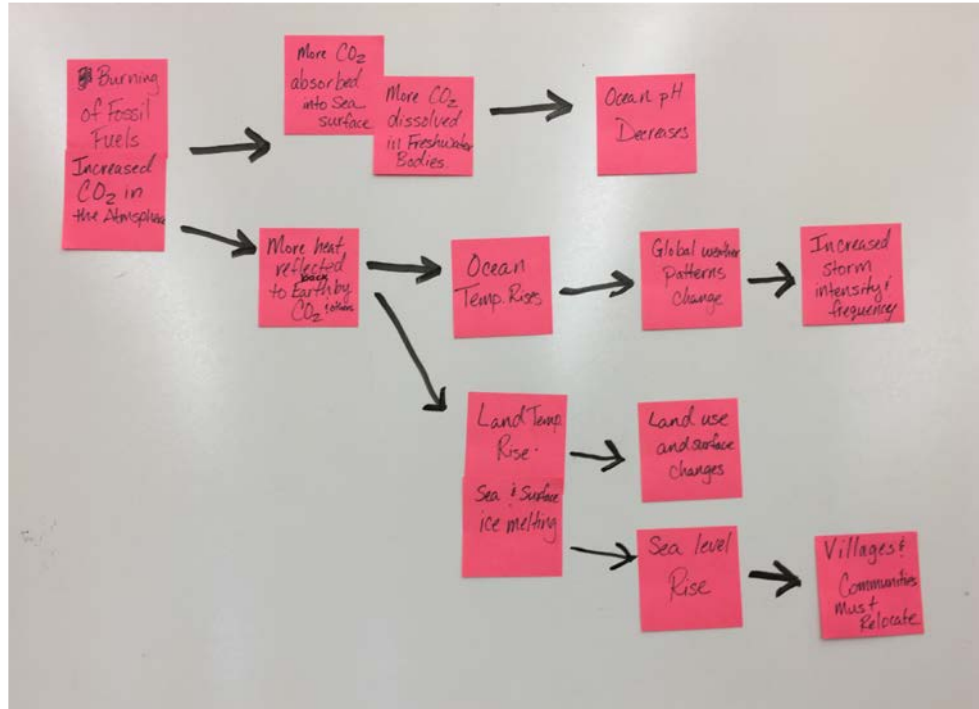
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Small groups build cause and effect flow chart

- a. refer to the global effects (the circled ideas) brought up about climate change from the think pair share recorded on the whiteboard,
- b. write one effect per sticky note
- c. begin with “Burning of fossil fuels”
- d. discuss the placement of each item, listen to each other, and work cooperatively
- e. use arrows to connect to all of the effects they include; more than one arrow can be drawn from a cause and effect.

Flow Chart Example



About Evidence

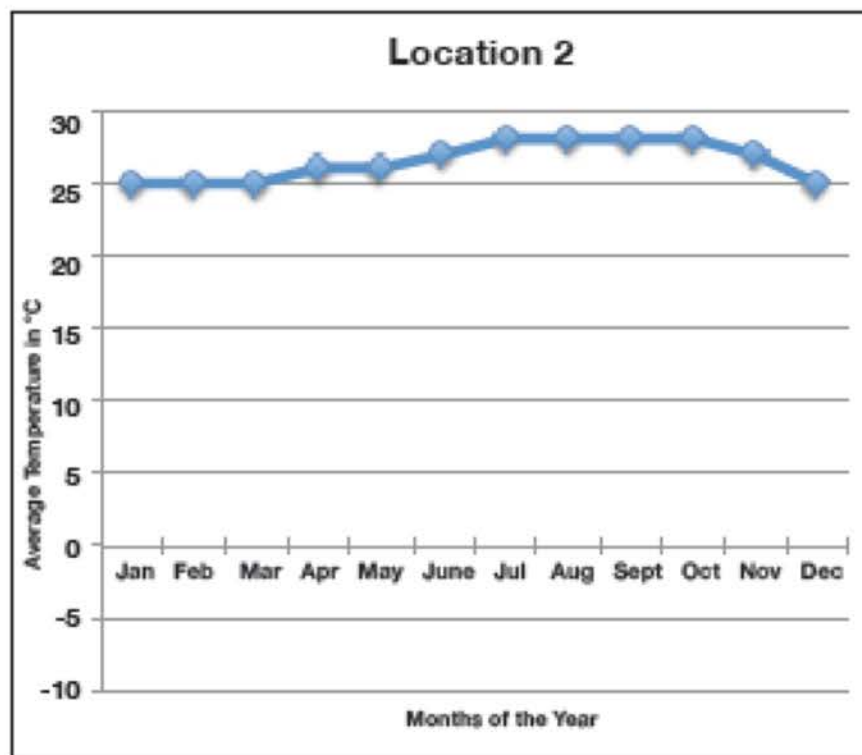
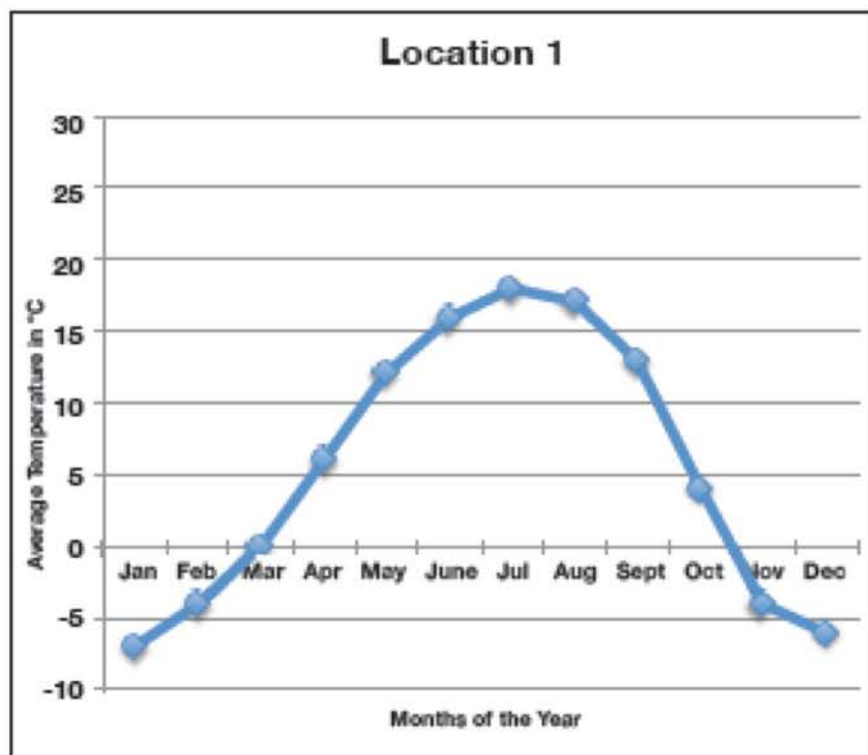
What counts as evidence?

What makes a good scientific explanation?

Example: Mystery Locations

Which average temperatures are for Hawaii? Alaska?

What is your evidence?



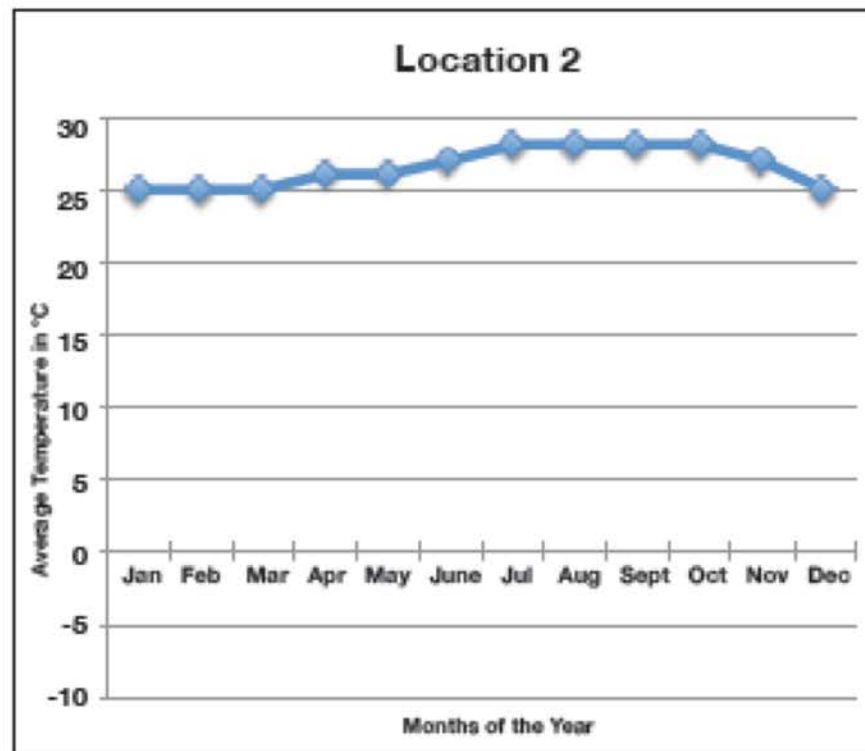
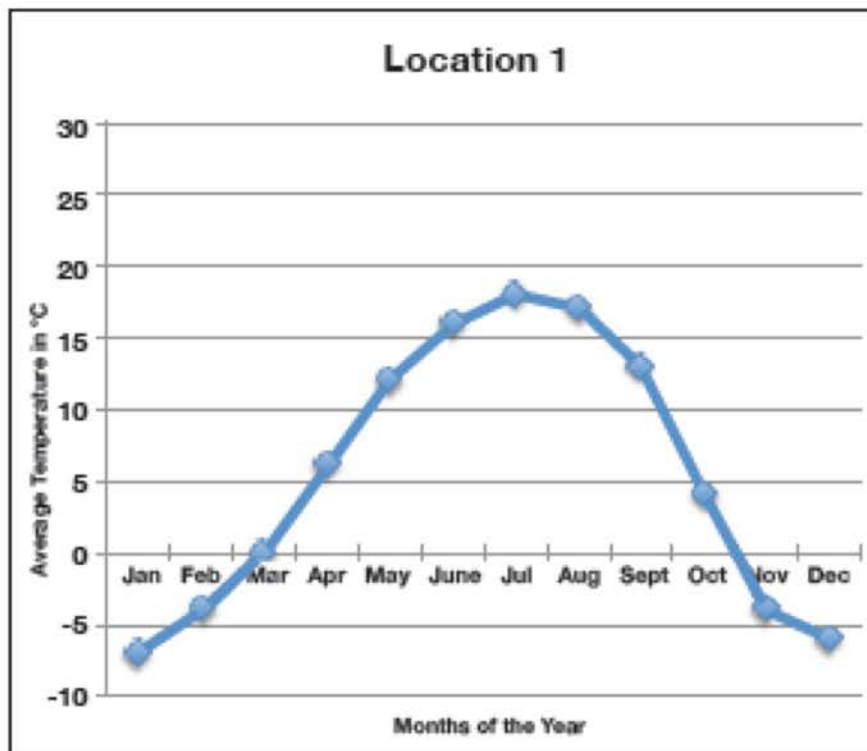
Scientific Evidence

- Evidence is a clue that helps answer a question or explain something.
- Evidence can come from...
 - our own investigations.
 - other people’s investigations.
- Evidence includes reasoning about WHY or HOW the data help to answer the question or explain something.
- Scientific explanations are based on evidence.

What's wrong with this explanation?

Explanation #1:

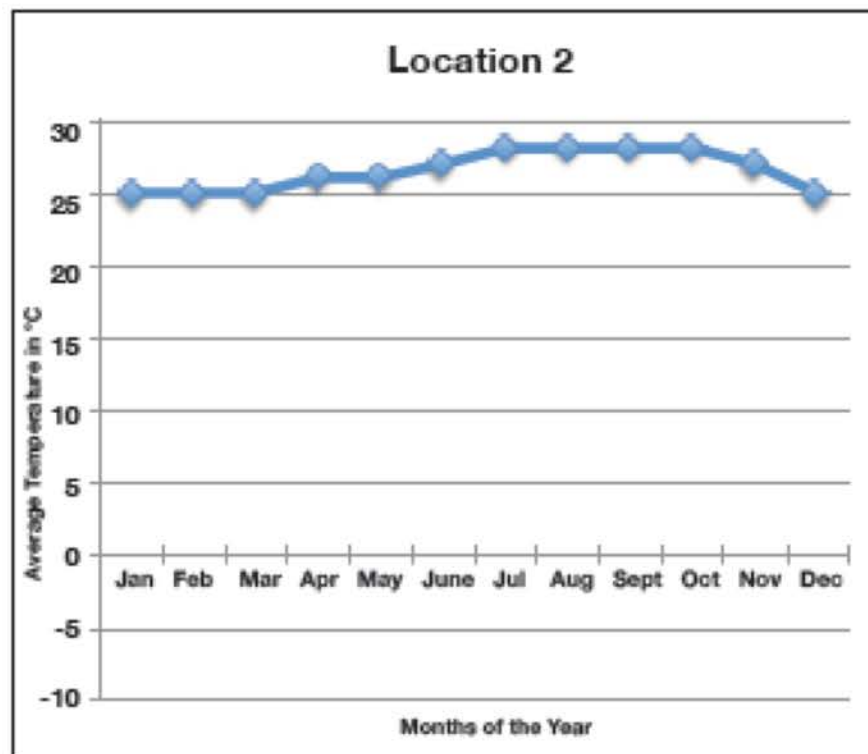
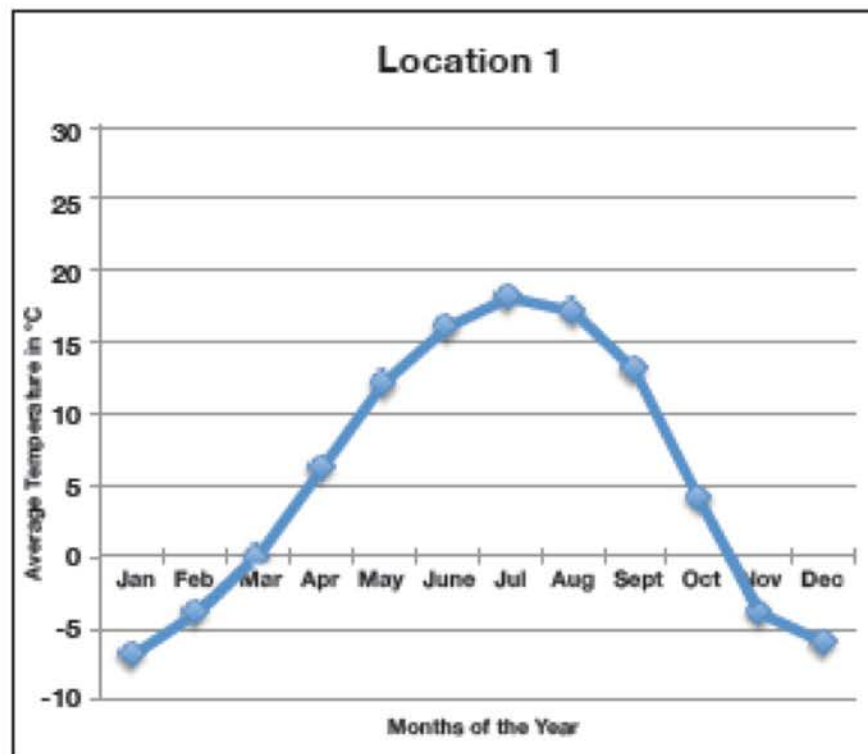
“I think Location 1 is Alaska. I don't know why. I just think that!”



What's wrong with this explanation?

Explanation #2:

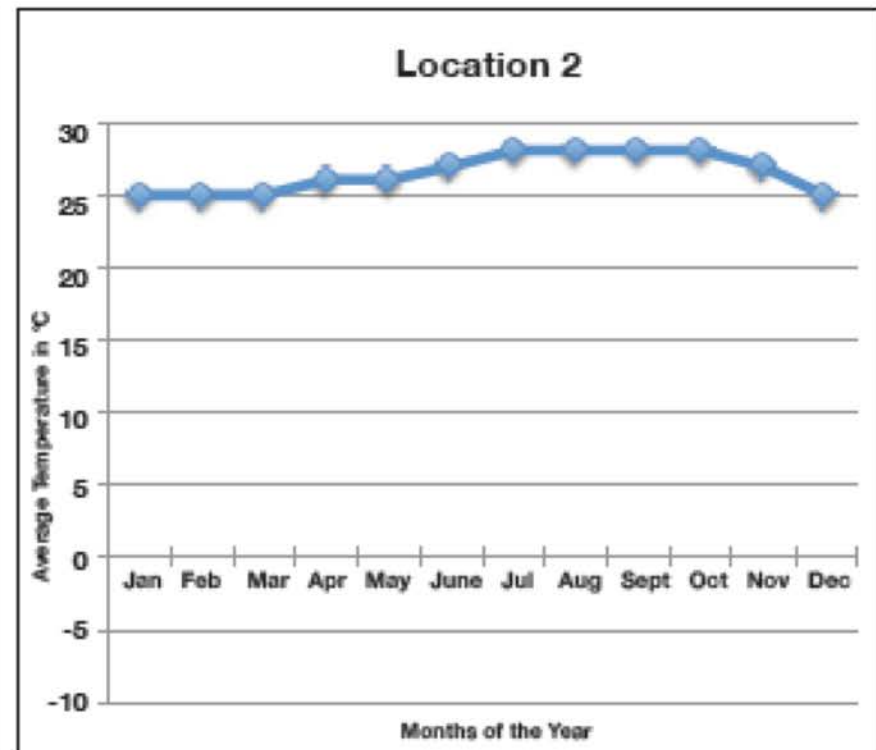
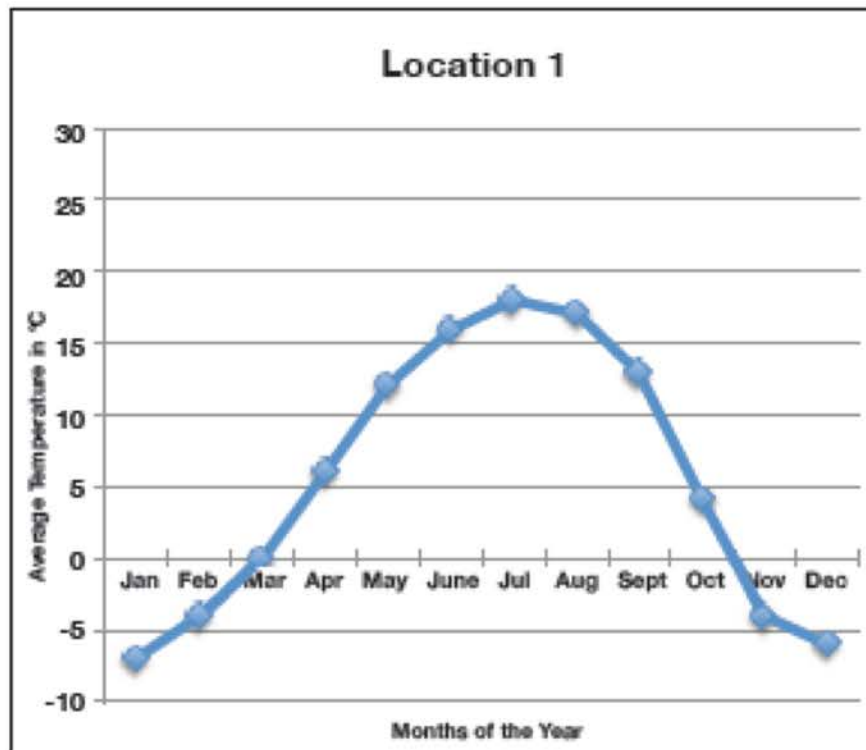
“The second one is Hawaii, because of the evidence.”



What's wrong with this explanation?

Explanation #3:

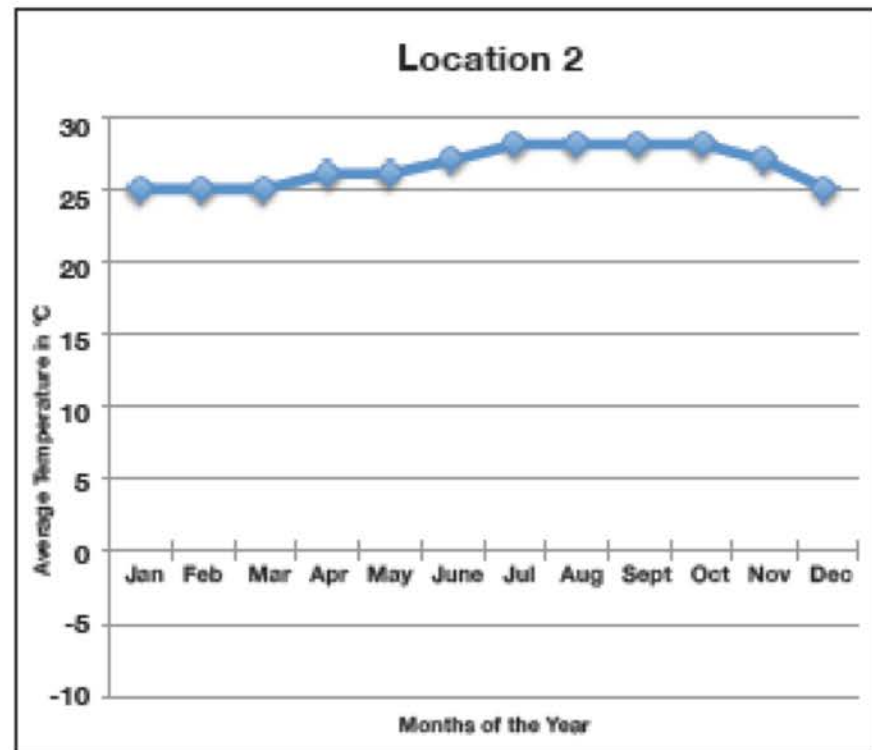
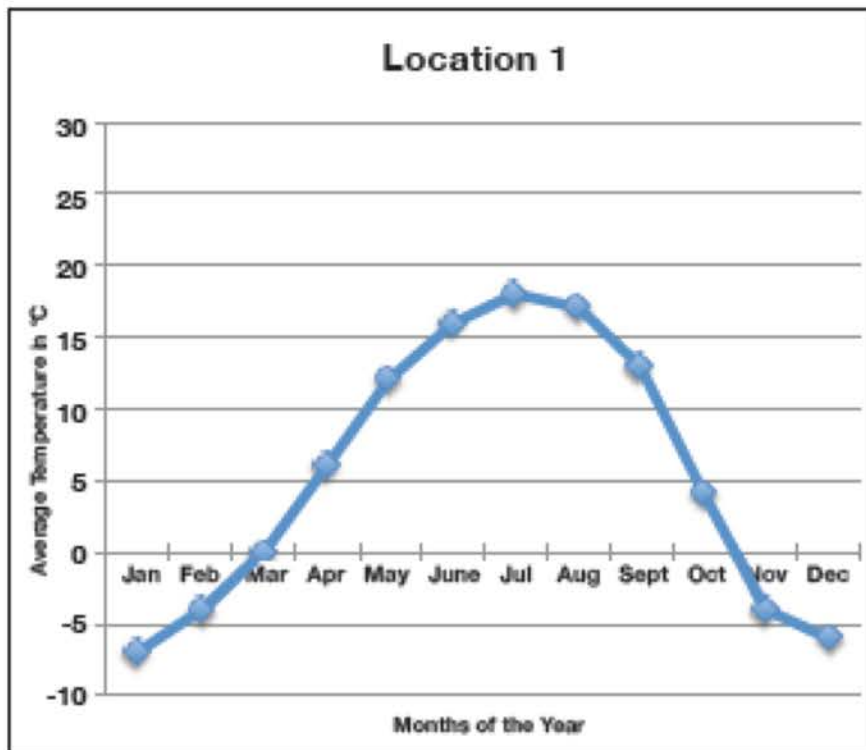
“I went to Hawaii once, and it was really warm there that week. I haven't been to Alaska, but my grandma has, and she said it was really cold. Also, when I've seen pictures of Alaska, it looks cold. That's why the first one is Alaska, and the second one is Hawaii.”



What's wrong with this explanation?

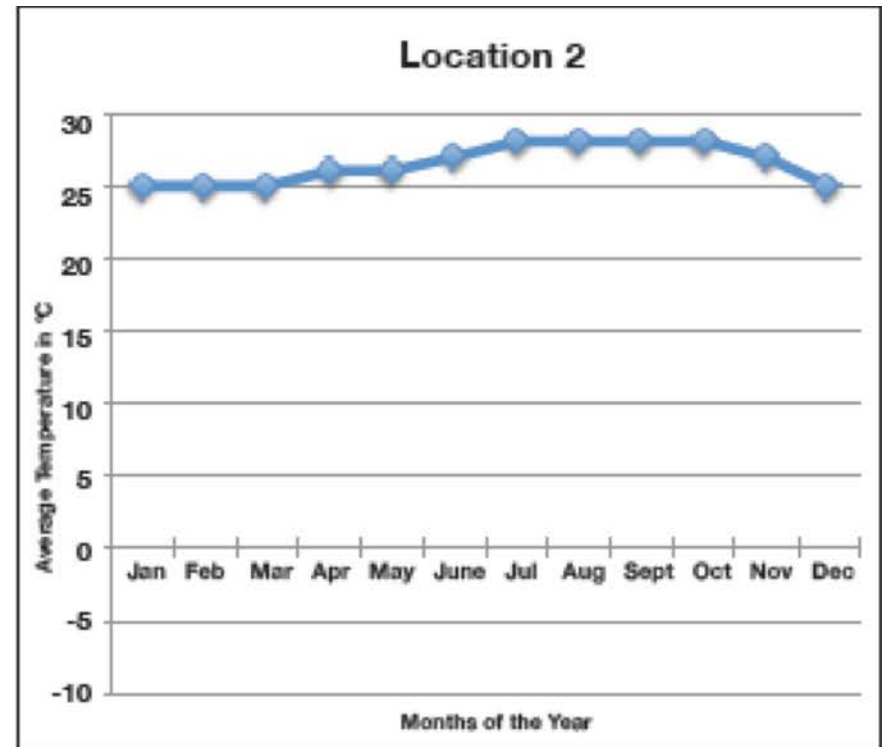
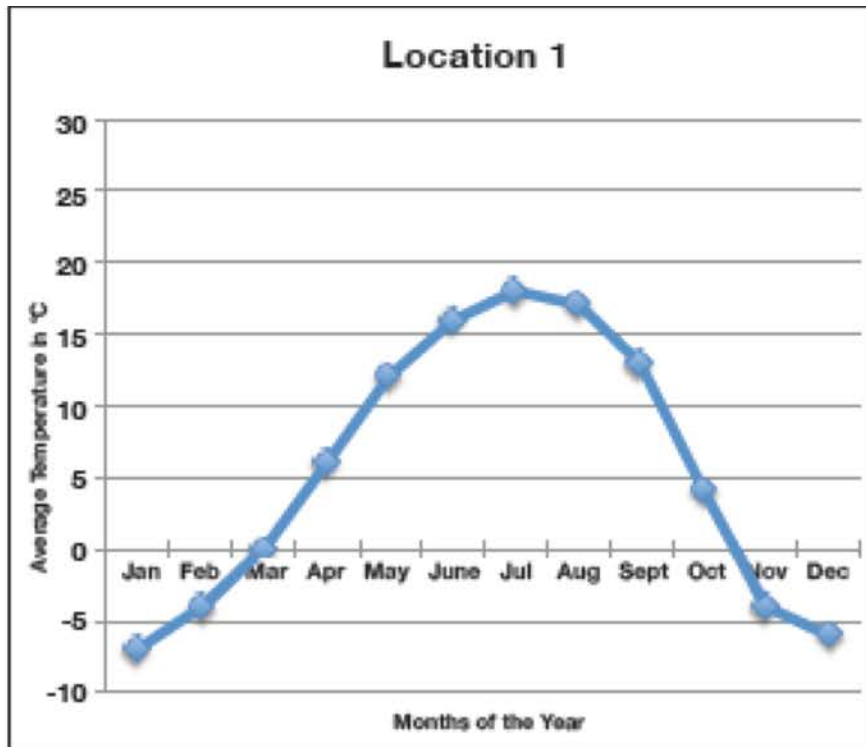
Explanation #4:

“On the world map, Alaska is near the North Pole, which means days are long in summer and short in winter. There would be a bigger difference between summer and winter temperatures. The graph shows a huge difference from winter to summer at the first location. That's why I think Location 1 is Alaska.”



Explanation #5:

On the world map, Alaska is near the North Pole, which means days are long in summer and short in winter. There would be a bigger difference between summer and winter temperatures because temperature is dependent on the number of hours of sunlight received in an area. The graph shows a huge difference from winter to summer at the first location. This means that the area is receiving very different amounts of sunlight at different parts of the year and must be very far from the equator. Therefore, I think Location 1 is Alaska.

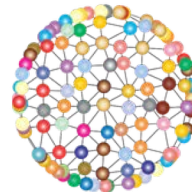


What makes a good scientific explanation?

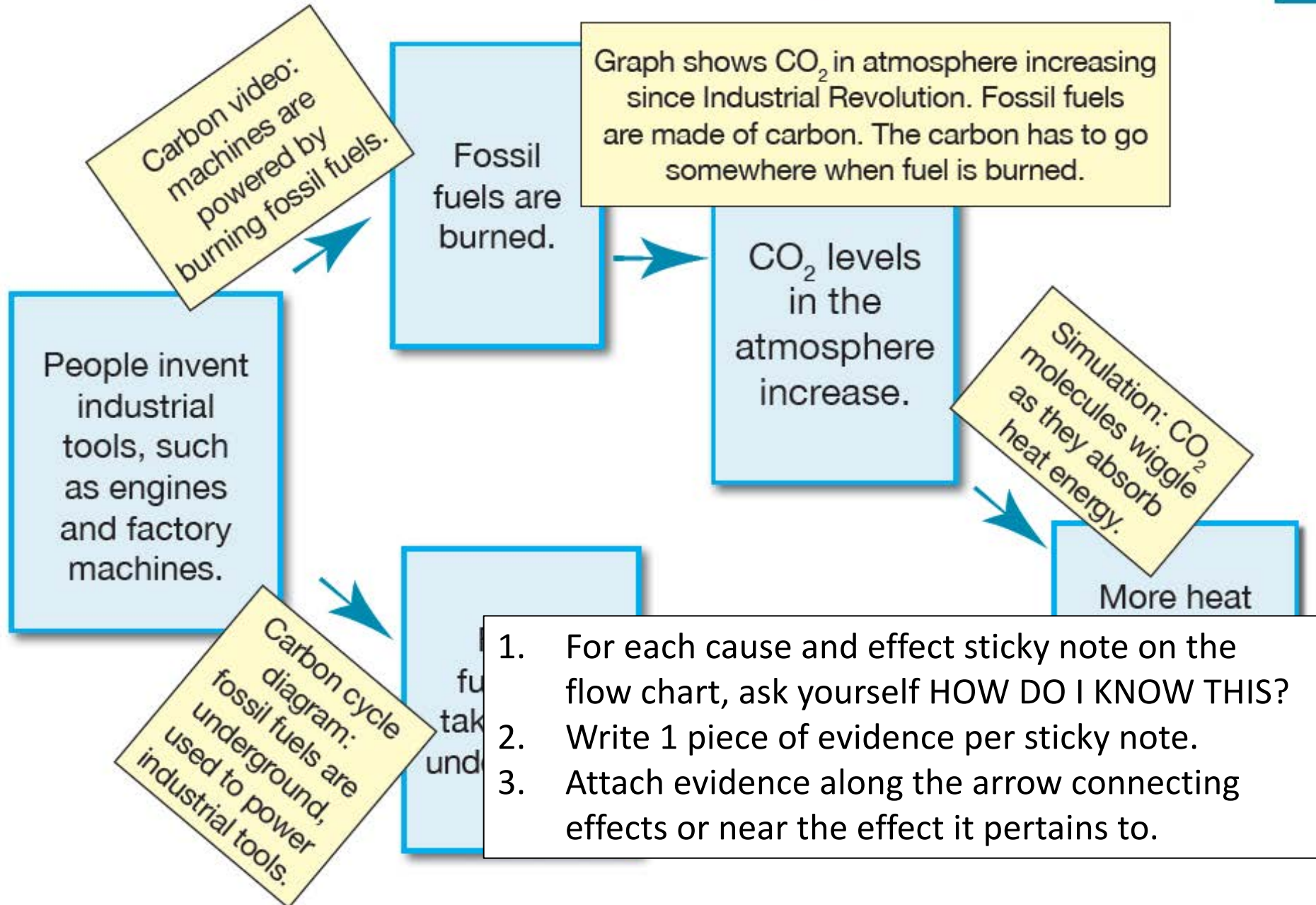
- The evidence supports the explanation.
- The evidence is based on carefully collected data and information, not just one casual observation.
- The evidence is from a reliable source.

Adding Evidence to Flow Charts

- Focus on the evidence gathered about causes and effects of climate change.
- For each sticky note on the flow chart – ask...
 - How do I know this???



Flow Chart with Evidence



1. For each cause and effect sticky note on the flow chart, ask yourself HOW DO I KNOW THIS?
2. Write 1 piece of evidence per sticky note.
3. Attach evidence along the arrow connecting effects or near the effect it pertains to.

Table Talk: local effects of global climate change

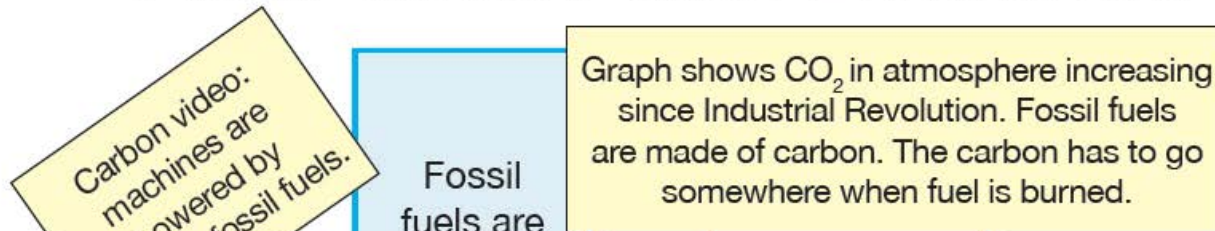
Think about your local ecosystems, natural environments and/or natural resources.

- What local changes do you think you will see in these as a result of global climate change?
- What are some of your local communities, cultures, industries, economies and/or businesses that rely on marine resources, the ocean, or other natural resources susceptible to effects of climate change?
- What effects of climate change are being addressed by local governments, communities and/or individuals?

Local Cause & Effect Flowcharts

Flow Chart with Evidence

3.6



- In small groups, reflect on ideas shared during Table Talk and determine what local effect(s) you could add to each of your flow charts
- Add local effects on sticky notes
- Share your local cause and effect flowcharts with another group to receive feedback.

