Global Availability of Freshwater

Plausibility Ratings

- **Model A: Earth's freshwater is abundant and will remain so even in the face of global climate change.**

  A person who supports this model makes the following argument:

  Earth is closed system. This means that there is no net water loss globally. Even with future impacts of climate change, the amount of freshwater will not change.

- **Model B: Earth has a shortage of freshwater that can be met by engineering solutions.**

  A person who supports this model makes the following argument:

  Although Earth may have a shortage of freshwater, advanced technology is rapidly changing. Future technological advances will ensure adequate freshwater supply.

- **Model C: Earth has a shortage of freshwater, which will worsen as our world's population increases.**

  A person who supports this model makes the following argument:

  Increasing population will limit the availability of freshwater supplies. Almost all human activities require freshwater. Climate change will further stress availability.

Plausibility Ratings

- Read the three models carefully and quietly.
- They each provide explanations for a specific scientific phenomenon.
- Discuss with partners and eventually as a class to clarify each model.

Plausibility Ratings

Plausibility is a judgment we make about the potential truthfulness of one explanatory model compared to another. The judgment may be tentative (not certain). You do not have to be committed to that decision.

Circle the plausibility of each model. [Make three circles, one for each model.]

	Greatly implausible (or even impossible)									Highly plausible
Model A	1	2	3	4	5	6	7	8	9	10
Model B	1	2	3	4	5	6	7	8	9	10
Model C	1	2	3	4	5	6	7	8	9	10

THE MEL PROJECT

Plausibility Ratings

What are some factors that you considered when determining the plausibility of the models?

Model Selection

In your work group:

Choose two of the three models to use in the MEL activity.

Place the model card on your worksheet. It will be super helpful if you put them on the sheet in alphabetical order, from top to bottom.

Write the model letter on the line.

Which models did you choose?
        A vs B
        A vs C
        B vs C

Why did you choose those two models?

Why did you exclude the one that you did?

Evidence Selection

Go through and carefully read each of the 9 lines of evidence and the supporting texts. Think about each question as you read:

Does the evidence support the model(s)?

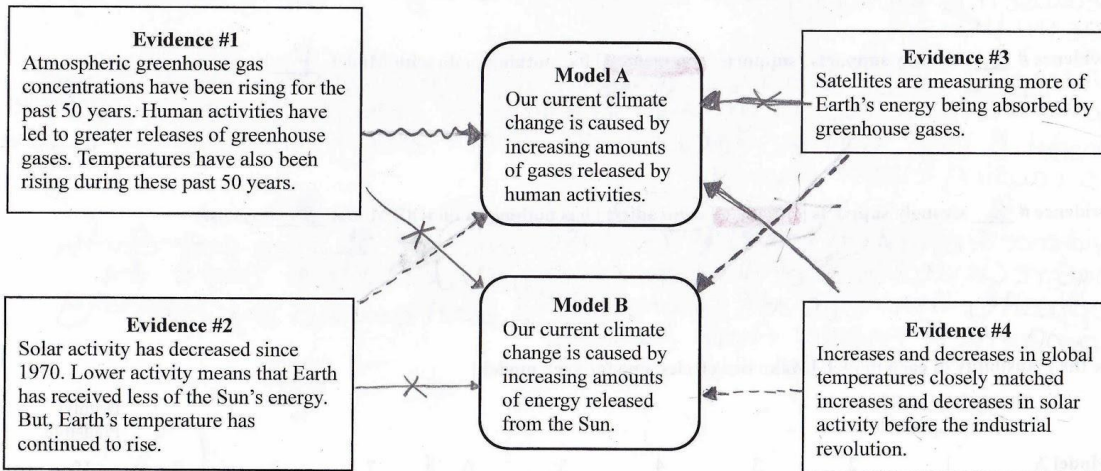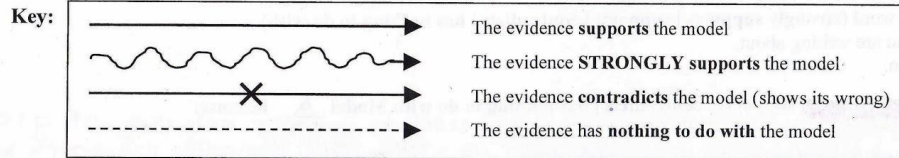Does the evidence *strongly* support the model(s)?

Does the evidence contradict the model(s)?

Does the evidence have nothing to do with the model(s)?

Choose 4 lines and your evidence cards on your worksheet in numerical order, from top to bottom, then left to right. Write the evidence letter on the line.

MEL Construction

Directions: Draw 2 arrows from each evidence box, one to each model. You will draw a total of 8 arrows.

Key:

→ The evidence **supports** the model

∿→ The evidence **STRONGLY** supports the model

—✗→ The evidence **contradicts** the model (shows its wrong)

┄┄→ The evidence has **nothing to do with** the model

Evidence #1
Atmospheric greenhouse gas concentrations have been rising for the past 50 years. Human activities have led to greater releases of greenhouse gases. Temperatures have also been rising during these past 50 years.

Model A
Our current climate change is caused by increasing amounts of gases released by human activities.

Evidence #3
Satellites are measuring more of Earth's energy being absorbed by greenhouse gases.

Model B
Our current climate change is caused by increasing amounts of energy released from the Sun.

Evidence #2
Solar activity has decreased since 1970. Lower activity means that Earth has received less of the Sun's energy. But, Earth's temperature has continued to rise.

Evidence #4
Increases and decreases in global temperatures closely matched increases and decreases in solar activity before the industrial revolution.

Use the additional information for your evidences to help you evaluate the relationship between them and each model.

Draw 2 arrows from each evidence box, one to each model (totaling 8 arrows).

Use the key to show how each evidence relates to the model.

Explanation Worksheet

Name: _____ Date: _____ Teacher: _____ Period: _____

Please work on this part individually after you complete your diagram. Now that you have completed the diagram, reconsider the plausibility of Models A, B, and C.

Circle the plausibility of each model. [Make three circles, one for each model.]

	Greatly implausible (or even impossible)									Highly plausible
Model A	1	2	3	4	5	6	7	8	9	10
Model B	1	2	3	4	5	6	7	8	9	10
Model C	1	2	3	4	5	6	7	8	9	10

Did the plausibility of Model A, Model B, and/or Model C change after you completed the diagram? Yes or No [Circle One]

[Note: you may have to look at your previous ratings if you do not remember what they were. Ask your teacher for assistance.]

Which arrows changed your plausibility judgments about the models? If your plausibility judgment did not change, which arrows supported your original plausibility judgments? Use the following steps to provide two explanations for why your plausibility judgments did or did not change.

A. Write the number of the evidence you are writing about. [Note: it is okay to include more than one evidence]
B. Circle the appropriate word (strongly supports | supports | contradicts | has nothing to do with).
C. Write which model you are writing about. [Note: it is okay to include more than one model].
D. Then write your reason.

1. Evidence # _____ strongly supports | supports | contradicts | has nothing to do with Model _____ because:

2. Evidence # _____ strongly supports | supports | contradicts | has nothing to do with Model _____ because:

The final task is for you to individually re-rank the plausibility of each model and choose two of your compelling links to explain.

Select the two most interesting or important arrows that you feel are the best ones. Justify your thinking for choosing these links between the evidence and model in the space provided on the sheet.

This task is very important so please explain thoroughly.

Explanation Worksheet

Name: _____ Date: _____ Teacher: _____ Period: _____

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D. Then write your reason.

1. Evidence # _____ strongly supports | supports | contradicts | has nothing to do with Model _____ because:

2. Evidence # _____ strongly supports | supports | contradicts | has nothing to do with Model _____ because:

Which evidences were most compelling for you? Why?

Did your plausibility scores change? What about the those for the model you did not select?

How do you think differently about the topics surrounding freshwater resources?

ACKNOWLEDGEMENTS