

# Seminars on Science

## Climate Change Assessment

### ASSESSMENT COMPONENT: ASSIGNMENTS

Course Assignments introduce processes, tools and technologies that scientists use to ask and answer questions. Assignments engage learners in scientific practices and expose them to scientific processes.

**Overall Objective: To build content knowledge.**

**Climate Change - Week 2  
Drivers over Time**

Objective	Exceeds course expectations	Meets course expectations	Approaches course expectations	Does not meet course expectations
<b>To describe the time span of a particular driver</b>	Selected a driver and clearly articulated the time span associated with the driver in a way that demonstrated mastery of the content.	Selected a driver and described the time span in a way that demonstrated understanding of the content.	Described the time span of a driver in a way that did not demonstrate understanding or may have been inaccurate.	Did not describe the time span of the driver.
<b>To explain why a driver operates over a particular time span</b>	Clearly articulated why the selected driver operates over a particular time span in a way that demonstrated mastery of the content.	Explained why the selected driver operates over a particular time span in a way that demonstrated understanding of the content.	Explained why the driver operates over a particular time span in a way that did not demonstrate understanding or may have been inaccurate.	Did not explain the reason for the time span.
<b>To communicate scientific ideas</b>	Communicated ideas effectively using appropriate course-related language.	Generally communicated ideas using appropriate course-related language.	Generally communicated ideas but did not use course-related language.  OR Writing contained significant errors.	Did not communicate scientific ideas.
<b>To cite reference sources</b>	Cited all reference sources in an organized manner.	Cited reference sources in an organized manner with minor errors.	Some reference sources omitted or poorly organized.	Did not cite reference sources.

Climate Change – Week 3  
Using a Global Climate Model: Part 1

Objective	Exceeds course expectations	Meets course expectations	Approaches course expectations	Does not meet course expectations
<b>To estimate the length of time it takes to run a simulation using EdGCM</b>	Logically estimated and clearly explained the calculations for the length of time it takes to run a simulation.	Estimated and explained the length of time it takes to run a simulation.	Attempted to estimate the length of time with some errors. Included some explanation.	Did not estimate the length of time.
<b>To describe the similarities and differences between the two scenarios</b>	Used the completed comparison table to describe the similarities and differences between the two scenarios in a way that demonstrated mastery of the content.	Used the completed comparison table to describe the similarities and differences between the two scenarios in a way that demonstrated understanding of the content.	Described some of the similarities and differences in a way that did not demonstrate understanding or may have been inaccurate.  OR  Did not complete the comparison table.	Did not describe the similarities and differences.
<b>To predict the potential differences in Annual Surface Air Temperature and Snow and Ice Coverage for the two scenarios</b>	Thoughtfully predicted the potential differences in Annual Surface Air Temperature and Snow and Ice Coverage for the two scenarios and supported predictions with evidence.	Predicted the differences in Annual Surface Air Temperature and Snow and Ice Coverage with some evidence to support predictions.	Predicted the differences in Annual Surface Air Temperature and Snow and Ice Coverage with little or no evidence to support predictions.	Did not predict the differences.
<b>To communicate scientific ideas</b>	Communicated ideas effectively using appropriate course-related language.	Generally communicated ideas using appropriate course-related language.	Generally communicated ideas but did not use course-related language.  OR  Writing contained significant errors.	Did not communicate scientific ideas.

Climate Change – Week 4  
Using a Global Climate Model: Part 2

Objective	Exceeds course expectations	Meets course expectations	Approaches course expectations	Does not meet course expectations
<b>To interpret graphs of Surface Air Temperature</b>	Accurately interpreted graphs in a way that demonstrated mastery of the content.	Interpreted graphs in a way that demonstrated understanding of the content.	Interpreted graphs in a way that did not demonstrate understanding or may have been inaccurate.	Did not interpret graphs.
<b>To interpret maps of Surface Air Temperature</b>	Accurately interpreted maps in a way that demonstrated mastery of the content.	Interpreted maps in a way that demonstrated understanding of the content.	Interpreted maps in a way that did not demonstrate understanding or may have been inaccurate.	Did not interpret maps.
<b>To interpret maps of Snow and Ice Coverage</b>	Accurately interpreted maps in a way that demonstrated mastery of the content.	Interpreted maps in a way that demonstrated understanding of the content.	Interpreted maps in a way that did not demonstrate understanding or may have been inaccurate.	Did not interpret maps.
<b>To create and analyze maps of a third variable</b>	Used EVA to create an anomaly map showing a third variable. Analysis demonstrated mastery of the content.	Used EVA to create an anomaly map showing a third variable. Analysis demonstrated understanding of the content.	Did not include map of a third variable.  OR  Analysis did not demonstrate understanding or may have been inaccurate.	Did not create and analyze a map.
<b>To communicate scientific ideas</b>	Communicated ideas effectively using appropriate course-related language.	Generally communicated ideas using appropriate course-related language.	Generally communicated ideas but did not use course-related language.  OR  Writing contained significant errors.	Did not communicate scientific ideas.

Climate Change – Week 5  
Using an Empirical Climate Model

Objective	Exceeds course expectations	Meets course expectations	Approaches course expectations	Does not meet course expectations
<b>To observe the individual contribution of each variable</b>	Made in-depth observations of all four variables in a way that demonstrated mastery of the content.	Made observations of all four variables in a way that demonstrated understanding of the content.	Made observations of the variables in a way that did not demonstrate understanding or may have been inaccurate.  OR Did not make observations for all four variables.	Did not make observations.
<b>To analyze how different settings change the model</b>	Manipulated the model to observe how variables interact and thoroughly analyzed the results.	Manipulated the model and analyzed the results.	Attempted to analyze the manipulated variables with some errors.	Did not analyze.
<b>To make conclusions regarding the effects of four variables on temperature fluctuations</b>	Made logical and accurate conclusions about the overall effects of the four variables on observed temperature fluctuations based on the model in a way that demonstrated mastery of the content.	Made accurate conclusions about the effects of the variables in a way that demonstrated understanding of the content.	Made conclusions about the effects of the variables in a way that did not demonstrate understanding or may have been inaccurate.	Did not make conclusions.
<b>To compare and contrast an empirical model with a Global Climate Model</b>	Thoroughly compared and contrasted the models in a way that demonstrated mastery of the content.	Compared and contrasted the models in a way that demonstrated understanding of the content.	Compared and contrasted models in a way that did not demonstrate understanding or may have been inaccurate.  OR Omitted comparing or contrasting.	Did not compare and contrast.
<b>To explain how climate scientists use empirical models</b>	Accurately explained how climate scientists might use empirical models in a way that demonstrated mastery of the content.	Explained how climate scientists might use empirical models in a way that demonstrated understanding of the content.	Explained how scientists might use empirical models in a way that did not demonstrate understanding or may have been inaccurate.	Did not explain.
<b>To communicate scientific ideas</b>	Communicated ideas effectively using appropriate course-related language.	Generally communicated ideas using appropriate course-related language.	Generally communicated ideas but did not use course-related language.  OR Writing contained significant errors.	Did not communicate scientific ideas.

OVERALL ASSESSMENT: ASSIGNMENTS (COURSE WEIGHT: 30%)

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**ASSESSMENT COMPONENT: DISCUSSIONS**

A large part of learning in our online courses occurs through discussion (text-based, asynchronous message exchanges). You are expected to be in frequent contact with your instructional team and other learners in the course's Discussion areas.

While this can be different from face-to-face communication, the same characteristics make classroom and online discussions meaningful. Both consist of two-way exchanges between teachers and learners: a back-and-forth that engages and deepens the understanding of all participants.

Each Discussion is graded two weeks after it begins. Weekly grades are based on how well learners reflect on content, engage in discussion with faculty and other students, and extend the online conversation (see the first two rows in the rubric). These grades will appear in the gradebook and will be combined with grades for the completion of Discussion assignments (see the third row in the rubric) to determine an Overall Assessment for Discussions.

**Overall Objective: To construct content knowledge and community.**

<b>Objective</b>	<b>Exceeds course expectations</b>	<b>Meets course expectations</b>	<b>Approaches course expectations</b>	<b>Does not meet course expectations</b>
<b>To support reflections on content</b> (Discussion Grade Weight: 45%)	Reflected on the Discussion question using course materials while drawing on other resources and asking additional questions.	Reflected on the Discussion question using course materials.	Did not adequately reflect on the discussion question or did not relate post to course materials.	Did not post, or posted without addressing the Discussion question.
<b>To engage in the online learning community and extend the online conversation</b> (Discussion Grade Weight: 35%)	Posted many substantive and timely responses to other learners and course faculty.	Often responded in a substantive and timely manner to other learners and course faculty.	Occasionally responded substantively to other learners and course faculty, or failed to post in a timely manner.	Posted few or no substantive responses.
<b>To complete the Discussions</b> (Discussion Grade Weight: 20%)	Completed all of the Discussions.	Completed almost all of the Discussions.	Completed more than half of the Discussions.	Completed few or no Discussions.

<b>OVERALL ASSESSMENT: DISCUSSIONS (COURSE WEIGHT: 40%)</b>
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### ASSESSMENT COMPONENT: FINAL PROJECT

You have two options for the *Final Project*.

- *Application in the Classroom*: an instructional unit based on a course topic that you might be interested in using in your own classroom or environment. How could you use questions related to this course to support research and inquiry exploration in an educational setting?
- *Application in the Field*: a research proposal that relates to a course topic you find particularly interesting. What question would you pursue if you could? How would you plan to answer that question?

**Overall Objective: To build and demonstrate understanding of course content.**

Objective	Exceeds course expectations	Meets course expectations	Approaches course expectations	Does not meet course expectations
<b>To demonstrate content knowledge</b>	Project demonstrated mastery of course content by applying appropriate scientific concepts.	Project demonstrated understanding of course content by applying appropriate scientific concepts.	Project demonstrated a limited understanding of course content by applying appropriate scientific concepts.	Project failed to demonstrate an understanding of course content.
<b>To support scientific inquiry</b>	Project clearly supported scientific inquiry, either by raising and investigating important questions in a manner consistent with the way scientists study the natural world, or through the clear design of classroom materials that provide students with opportunities to ask important questions and to gather, organize, analyze, and evaluate relevant information.	Project supported scientific inquiry, either by raising and investigating questions or by designing classroom materials that may provide students with opportunities to ask important questions and to gather, organize, analyze, and evaluate relevant information.	Project sought to support scientific inquiry, either by raising important questions or by designing classroom materials that might enable student research projects or practice to emerge.	Project did not support scientific inquiry.
<b>To integrate and organize content</b>	Incorporated all of the required elements, as well as a clearly articulated introduction and conclusion in an organized sequence that demonstrates the goals of the project.	Incorporated all of the required elements, as well as a clearly articulated introduction and conclusion in an organized sequence that demonstrated the goals of the project. Some elements lacked depth and/or clarity.	Incorporated most but not all of the required elements, or lacked an organized sequence that demonstrated the goals of the project.	Did not incorporate the required elements.
<b>To use resources (essays, books, videos, websites, etc.)</b>	Critically analyzed all resources. Incorporated personal ideas, course based materials, and additional resources.	Incorporated personal ideas, course based materials, and additional resources.	Drew upon some course-related resources.	Did not use resources effectively in the project.
<b>To organize time schedules</b>	Completed all of the milestones and the final project by the date each was due.	Completed one milestone by the due date; submitted one after the due date. Completed the final course project by the due date.	Both milestones completed, but one or both submitted after the due date. Completed the final project after the due date.  OR  Did not complete the milestones. Completed the final project by the due date.	Did not complete the project milestones. Completed the final project after the due date.

**WEEK 3 FINAL PROJECT SUBMISSION (COMPLETE OR INCOMPLETE)**

**WEEK 5 FINAL PROJECT SUBMISSION (COMPLETE OR INCOMPLETE)**

**OVERALL ASSESSMENT: FINAL PROJECT (COURSE WEIGHT: 30%)**