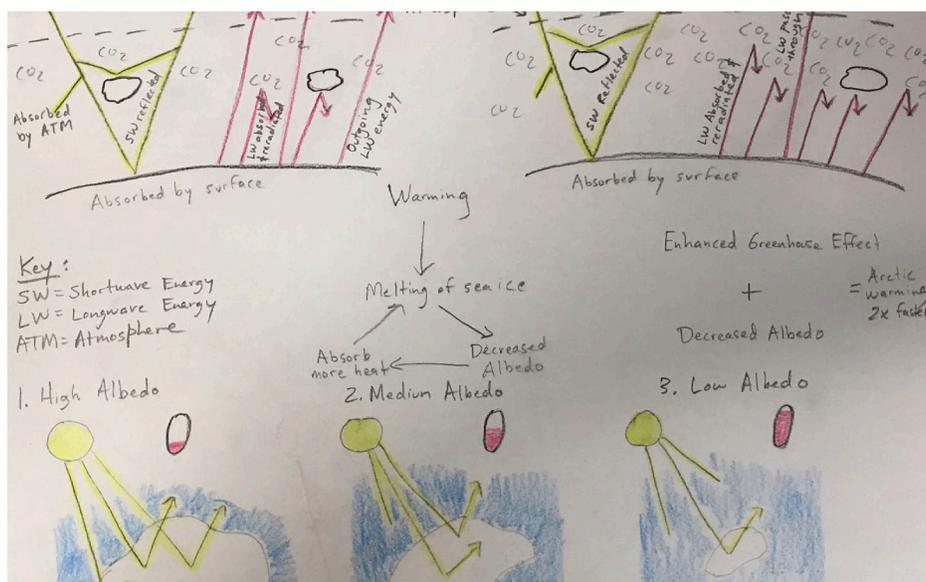


Building Consensus: Final Model Construction

Setting the Stage

Scientists gather evidence and develop models to represent phenomena. As new evidence is acquired, models are revised, an iterative process that goes on indefinitely. In this lesson, students draw on concepts and evidence acquired during the unit to construct final models for the unit driving question, “Why might the Arctic be warming twice as fast as the rest of the world?”



Lesson Overview

- **Part 1 – (45 minutes) Final Model Construction**
Students work in pairs to construct their final models for the unit driving question, “Why might the Arctic be warming twice as fast as the rest of the world?”
- **Part 2 – (15 minutes) Gotta-Have Checklist**
Students work as a whole class to create checklist (~5-10 items long) of all ideas/concepts necessary to explain the driving question

Instructional Overview	
Grade Level	Middle/High School
Instructional Time	60 minutes (may take longer depending on the class)



Standards Alignment	<p>NGSS Disciplinary Core Ideas:</p> <ul style="list-style-type: none"> • ESS2.A: Earth Materials and Systems • ESS2.D: Weather and Climate <p>NGSS Science and Engineering Practices:</p> <ul style="list-style-type: none"> • Developing and Using Models • Constructing Explanations <p>NGSS Crosscutting Concepts:</p> <ul style="list-style-type: none"> • Systems and System Models
Unit Driving Question	<ul style="list-style-type: none"> • Why might the Arctic be warming twice as fast as the rest of the world?
Driving Question(s) For This Lesson	<ul style="list-style-type: none"> • Why do scientists continue to gather evidence and revise models of phenomena?
Learning Goals	<ul style="list-style-type: none"> • Construct a model that explains why the Arctic is warming twice as fast as the rest of the world?
Materials	<ul style="list-style-type: none"> <input type="checkbox"/> Building Consensus PPT <input type="checkbox"/> Final Model Student Worksheet (1 per group) <input type="checkbox"/> Colored pencils <input type="checkbox"/> Markers <input type="checkbox"/> Butcher Paper or online document to create “Gotta-Have Checklist” <input type="checkbox"/> Summary Table <input type="checkbox"/> Initial Ideas Public Record
Material Preparation	<ul style="list-style-type: none"> <input type="checkbox"/> Cue and test web links <input type="checkbox"/> Review speaker notes in the Building Consensus PPT <input type="checkbox"/> Display summary table and initial ideas public record. <input type="checkbox"/> See Gotta-Have Checklist Example <input type="checkbox"/> See Final Summary Table Example <input type="checkbox"/> See Final Model Examples
Vocabulary	<ul style="list-style-type: none"> • No new vocabulary



Part 1 - Final Model Construction (45 minutes)

Refer to Part 1 slides included in the [Building Consensus PPT](#). See PPT presenter notes for additional information.

1. Summarize the “Arctic Feedbacks” unit referring to the final summary table and initial ideas public records (see [final summary table example](#))
2. In small groups or as a whole class, create a list of all relevant parts and data/evidence that should be included in the final descriptive models representing the unit driving question.
 - a. Students should record this list of ideas on their “[Final Model Student Worksheet](#)”.
3. Refer to the [Building Consensus PPT](#) to review the “signs and symbols to connect relevant parts” (slide #4) and provide any additional instructions for the final model construction phase.
4. Students work in pairs to construct their final models (see [final model examples](#)).
 - a. Teacher should be prepared to:
 - i. Prompt each group to describe how and why they changed the model.
 - ii. Ask probing questions
 - iii. Compare and contrast ideas across groups

Optional: Model Sharing

- Facilitate a gallery walk in which students have the opportunity to observe their peers’ models.

Part 2 - Gotta-Have Checklist (15 minutes)

Refer to Part 2 slides included in the [Building Consensus PPT](#). See PPT presenter notes for additional information.

1. Students take 5 minutes (in their final model construction pair/group) to create a list of 3-5 ideas/concepts they think must be included in a final written explanation of the unit driving question (refer to Building Consensus PPT).
2. Teacher facilitates a whole-class discussion in which students share their lists. Before adding an idea/concept to the Gotta-have checklist, make sure the class has come to a consensus. A completed checklist (~5-10 items long) should contain all ideas/concepts necessary to explain the unit driving question.
3. Review each idea/concept on the Gotta-have checklist and ask students to consider what evidence they have for each bullet. This could be quantitative data, the name of a



simulation or video, or the title of a lesson/lesson part they completed. Record the evidence in a separate color next to the corresponding bullet idea/concept (see [Gotta-Have Checklist Example](#))

- a. Note: Students will refer to the Gotta-have checklist when writing their final explanations (Lesson 10).