Key for M-STEP Grade 11 Science
Online Tools Training (OTT) Sample Items

Grade 11 Sample Item Cluster: Atmospheric Changes over Time

Topic Bundle: Earth's Systems*

Item #	NGSS Alignment	Key (screenshot for interaction type)	Assessment Claim
Atmospheric Changes over Time (Part 1)			
1	**HS.ESS2.A** **SEP 2-**Developing and Using Models **CCC 7-**Stability and Change	photosynthesis, diffusion to the ocean	The student uses the model to make a prediction about how changes in parts of the carbon cycle would affect other parts of the cycle.
2	**HS.ESS2.D** **SEP 4-**Analyzing and Interpreting Data **CCC 7-**Stability and Change	increased, fossil fuel combustion	The student uses the model and the data table to explain changes in atmospheric carbon dioxide concentrations over time.
3	**HS.ESS2.D** **SEP 4-**Analyzing and Interpreting Data **CCC 7-**Stability and Change	This item has two possible keys, both of which should be marked correct. Key 1 (possible correct answers): oxygen, increased, photosynthesis Key 2 (possible correct answers): carbon dioxide, decreased, photosynthesis	The student uses the model and the data table to explain changes in atmospheric oxygen concentrations over time.

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Item #	NGSS Alignment	Key (screenshot for interaction type)	Assessment Claim
Atmospheric Changes over Time (Part 2)			
4	**HS.ESS2.C** **SEP 3-**Planning and Carrying Out Investigations **CCC 5-**Energy and Matter	**Part A:** d **Part B:** a small, no	The student uses the data from the investigation to explain the difference in energy absorption of two materials.
5	**HS.ESS2.C** **SEP 3-**Planning and Carrying Out Investigations **CCC 5-**Energy and Matter	**Modification**: Place a thin sheet of metal on top of a second cup of water, and put it under the heat lamp for ten minutes. Then compare the water temperature of the two cups. **Reasoning**: Covering the cup of water represents snow and would reflect light from the heat lamp.	The student determines how to modify the investigation to answer a new question.

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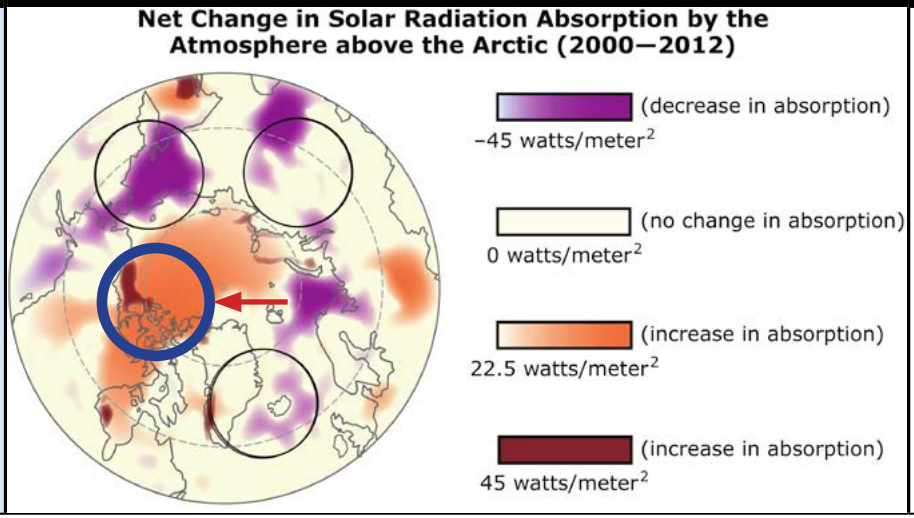
6	**HS.ESS2.D** **SEP 4-**Analyzing and Interpreting Data **CCC 7-**Stability and Change		The student compares graphical information and extrapolates evidence to support a claim about trends in solar radiation absorption.

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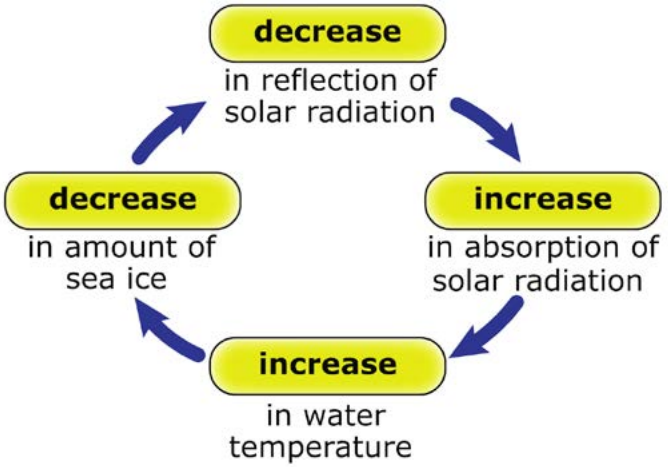
7	**HS.ESS2.D** **SEP 7-**Engaging in Argument from Evidence **CCC 7-**Stability and Change	Part A of this item has two possible keys, both of which should be marked correct. **Part A:** Key 1 (possible correct answers)  	The student evaluates a design solution and determines trade-offs of the design solution.

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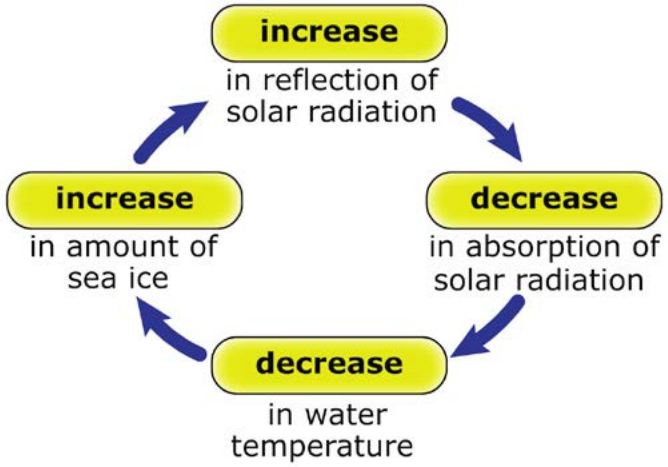
Item #	NGSS Alignment	Key (screenshot for interaction type)	Assessment Claim
7	**HS.ESS2.D** **SEP 7-**Engaging in Argument from Evidence **CCC 7-**Stability and Change	**Part A:** Key 2 (possible correct answers)  **Part B:** decreasing, increased CO2 , decrease, polar bears, polar bears	The student evaluates a design solution and determines trade-offs of the design solution.

*** NGSS Topic Bundle Link:** [HS.Earth's Systems | Next Generation Science Standards]