

INDEXING
GLOBE
TO NATIONAL & INTERNATIONAL
STANDARDS

A PROJECT OF THE GLOBE CLASSROOM ASSESSMENT
TEAM AT SRI INTERNATIONAL

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GLOBE Classroom Assessment Tools

“How to Index YOUR Standards to GLOBE”

The classroom assessment team at SRI International has developed a series of protocols designed to facilitate your efforts to index GLOBE to standards. The pages that follow represent our first draft efforts (‘97 Implementation Guide only). These materials can be used as a starting place for GLOBE partners, curriculum specialists, and teachers as they work together with district- and state-level officials to build a coherent plan for implementing GLOBE activities.

1. Review Links to External Standards (NSES etc). This is helpful if YOUR standards are based on a set of reference standards. (Found in Sections 1, 2 & 3 of GLOBE Indexing Notebook)
2. Assemble Indexing Team/s (based on subject matter / grade level specialty; states with multiple franchises might consider subdividing the task).
3. Index GLOBE Science & Inquiry Concepts to YOUR Standards. (Use templates in section 4 & 5 of GLOBE Indexing Notebook.)

ATMOSPHERE Concept	NGSS E - 1	NGSS E - 2	NGSS E - 3	NGSS E - 4
Heat and temperature	Heat can be produced in many ways, such as burning, rubbing, or rubbing one substance with another.	Energy is transferred in many ways. Heat energy is transferred when two warmer objects in contact cool, and both reach the same temperature.		Heat consists of microscopic and the vibrations of atoms, molecules, and ions. The higher the temperature, the greater the kinetic energy of molecules.
GLOBE Framework Strategies: Planning Investigations	NGSS Inquiry Standards	SCIENCE PRACTICES	INQUIRY	NGSS STANDARDS: Practices in Scientific Thinking, Tools & Technologies, Communication
Students select a topic, appropriate problem/application	<ul style="list-style-type: none"> Ask questions that can be answered with scientific knowledge and procedures. 	<ul style="list-style-type: none"> People use often learn about things around them by just observing them. (page 11) Ask questions about the world around them that lead to testable answers to test of them by making careful observations and trying things out. (page 20) 	Investigating the natural world	SP1 – Identify problems, propose and implement solutions, evaluate the accuracy, design and outcomes of investigations
GLOBE Framework Strategies: Planning Investigations	MEASUREMENT	SCIENCE PRACTICES	INQUIRY	NGSS STANDARDS: Practices in Scientific Thinking, Tools & Technologies, Communication
Students select a topic, appropriate problem/application	7. Observe, measure, record, or trace and interpret by generating ideas and questions, making plans, predicting.	<ul style="list-style-type: none"> Numbers & Operations (NO), Algebra (A), Geometry (G), Measurement (M), Data Analysis & Probability (DP), Cross-Cutting Concepts (CCC), Communication & Collaboration (C), Connections (Co), Properties of Matter (P) 	Investigating the natural world	SP1 – Identify problems, propose and implement solutions, evaluate the accuracy, design and outcomes of investigations SP2 – conduct a design process that includes problem, solution, and evaluation steps that might also be the study SP3 – connect into relevant questions

ATMOSPHERE SCIENCE CONCEPTS	Insert YOUR standard here
1. Composition of the atmosphere; human influences on changes in the Earth's atmosphere	
2. Cloud formation (including water cycle) and identification	
3. Clouds can be used to forecast / predict the weather	
4. Clouds can have a cooling/warming effect; effects of wind	
5. Earth's heat transfer is influenced by movement of water in the atmosphere	
6. Density (of rain, snow)	
7. Change of state; energy changes and changes in state; heat capacity	
8. Acids, bases, pH, pH measurement, buffers; acid precipitation and its effects	
9. Heat and temperature	
10. Heat transfer through radiation, conduction, and convection	
11. Different substances transfer energy and heat at different rates; some materials are good conductors, some are good insulators	
12. Substances expand and contract as the temperature changes; coefficient of expansion	
13. Classification helps us organize and understand the natural world.	
14. Models and simulations allow you to study a process or phenomenon that would be difficult to study in other ways; compare the predicted values (using the model) and the measured values; modify input parameters in order to predict realistic changes in output.	

- Establish Iterative Review Process and involve key District- & State- level personnel in the process to edit, review, and approve. Post approved index links on Web (ultimately).
- Cross-reference your selected standards to the Protocols, Learning Activities and Classroom Assessments (found in section 6, 7, & 8 of GLOBE Indexing Notebook) to create coherent lesson and curriculum plans.

GLOBE Key Concepts - Atmosphere	Cloud Type	Cloud Cover	Rainfall	Solar Rad.	pH	Max, Min and Current Temp
1. Composition of the atmosphere; human influences on changes in the Earth's atmosphere						
2. Cloud formation (including water cycle) and identification	X	X	X	X		
3. Clouds can be used to forecast/ predict the weather						
4. Clouds have a cooling/warming effect; effects of wind			X	X		

Inquiry Concepts in the ATMOSPHERE Inquiry also use	Cloud Type	Cloud Cover	Rainfall	Solar Precipitation	pH	Max, Min and Current Temp
1. Students set up a site, appropriate problem/application						
2. Student design an experiment						
3. Student specify measurement/variables to investigate						
4. Student pose relevant questions						
5. Observations and measurements are accurate and appropriate	X	X	X	X	X	X
6. Equipment is used properly			X	X	X	X
7. Measurement Quality - Data are detailed			X	X	X	X
8. Measurement Quality -Quality assurance procedures are employed (multiple, repeated readings, recalibration)	X		X	X	X	X

GLOBE Key Concepts - ATMOSPHERE	Describe earth's Clouds	Calculate Cloud Cover	Estimate amount of water	Explain the relationship	Land Water Air	Cloud Height	What's Up(Land Cover)
1. Composition of the atmosphere; human influences on changes in the Earth's atmosphere							
2. Cloud formation (including water cycle) and identification	X					X	X
3. Clouds can be used to forecast/ predict the weather						X	
4. Clouds can have a cooling/warming effect of clouds; effects of wind			X				
5. Human relationship is influenced by placement of water in the atmosphere					X		

ATMOSPHERE Inquiry Concepts	Students Identify Goals	Estimate Goal Size	Measure Data	Explain the Results	Land, Water, Air	Cloud Height
1. Students set up a site, appropriate problem / application						
2. Student design an experiment			X		X	
3. Student specify measurement/variables to investigate			X		X	
4. Student pose relevant questions						
5. Observations and measurements are accurate and appropriate	X		X	X	X	X

ATMOSPHERE SCIENCE CONCEPT	Primary	Elementary	Middle School	High School	Protocol Tools	NCTM activities	NCTE activities
1. Composition of the atmosphere; human influences on changes in the Earth's atmosphere							
2. Cloud formation (including water cycle) and identification	✓	✓					
3. Clouds can be used to forecast/ predict the weather	✓	✓	✓	✓			
4. Clouds can have a cooling/warming effect; effects of wind	✓	✓	✓	✓			

ATMOSPHERE Inquiry Concepts	Primary	Elementary	Middle School	High School	Protocol Tools	NCTM activities	NCTE activities
1. Use appropriate mathematical procedures		✓	✓	✓	1 2 3 4 5 6 7 8 9 10 11 12		
2. Infer patterns, trends	✓	✓	✓	✓			
3. Explain data and relationships	✓	✓	✓	✓			
4. Create multiple formats for representing data		✓	✓	✓			

Notes: