TEACHING FOR UNDERSTANDING UNIT/PROJECT ORGANIZER: You will use this unit/project organizer across several sessions to draft various elements of the TfU Framework. You may be designing a curriculum unit (e.g., a unit of instruction for a classroom, curriculum for a website, etc.) or you may be designing some other type of work project (e.g., a session with your staff, a training program for docents or other specialists or groups, an "in-museum guide," etc.).

We will be working on specific elements of the TfU Framework during Sessions 3, 4, and 5. You will type in your work related to the specific parts of the organizer that are the focus of each Unit/Project assignments for each of the Sessions—leaving the other parts blank. (E.g., For Session 3, we will just focus on the Title of your unit/project and any other information that you want to complete in the heading except the summary description. We will also work on your Generative Topic (plus criteria for a strong Generative Topic), and your Understanding Goals (in both statement and question form)—See Session 3, Assignments 3.2 and 3.3. As our sessions unfold, you may go back at any time and revise any section of this organizer that you completed previously. In fact, you will be asked to do that in some assignments. (Throughlines are optional in TfU 1. if you wish to try developing some Throughlines your coach will comment on them briefly; but the main emphasis in TfU 1 is on unit or project-level work—rather than year-long or course-long goals).

Your Name: _____Pascale, Seth & June aka Smithsonian Team #2_____
Title of Your Unit/Project: __Much Ado About Nothing? Reasoned Responses to Science in the News
Date:_____July 2009_____
Setting for the Unit/Project (class, museum, staff meeting, website etc.): ___Class__
Intended Audience: __7th and 8th grade students
Approximate Time the Unit/Project May Take: _____
Major Resources Needed:
Brief Summary (3-5 sentencesummary describing your unit/project):
Not everyone 'buys into' climate change - not even all experts agree.
After taking the online course, how can students sift through the debate and respond in ways that personally help them craft an empowering world view? What stand will they take on this and other, important science-based issues, and what inquiry processes will help them gain knowledge useful to them in developing reasoned positions?

(OPTIONAL IN TFU 1) THROUGHLINES [TLS] – (Large, Overarching Understanding Goals for an entire year, or quarter, or whole course etc. These general, overarching goals stay the same for every unit/project throughout the entire year, or quarter, etc.)

1. **Question Form: How can students use a variety of resources to learn about science issues that affect their daily lives?**
   Statement form: Students must use a variety of credible resources to learn about science and its connection to their daily lives.
2. **Question Form: After analyzing evidence provided in a variety of resources, what types of informed conclusions and decisions about science issues can students make that could affect their daily lives and future?**
   Statement form: Students must learn to analyze evidence from a variety of credible sources in order to develop conclusions and make informed decisions about science issues that affect their daily lives.

3. Question Form: How can the habits of mind formed through scientific investigations be utilized by students to build their understanding of the world that surrounds them?

Statement form: Scientific investigations provide opportunities for students to develop the habit of mind necessary to solve problems and understand their world.

GENERATIVE TOPIC [GT]

What is your Generative Topic? (Write your generative topic as a phrase, concept, or question from your discipline.)

How can students sift through differing points of view offered within scientific debate and respond in ways that personally help them craft an empowering world-view? What stand will they take on important science-based issues and how will that stand help them to creatively solve future problems?

CRITERIA for a GENERATIVE TOPIC [GT]: Explain how your Generative Topic meets the criteria below.

1. **Centrality:** (In which discipline do you see your topic as central, and why do you believe this topic of central importance to your discipline?)
   Every discipline in science has debate on the newest issues to arise as scientific discoveries are made. In the life sciences, we have issues dealing with species extinction, epidemics, health/DNA cloning, and others. In the physical sciences, we are struggling to resolve geologic and oceanographic conundrums, as well as issues with changing weather and climate, natural resources and the human impact on the environment. Finally, we are reaching for the worlds outside of our own. There is much debate about the nature of our universe and the possible resources or plans for moves to the moon and Mars.

2. **Engagement: (**Why will it interest you and your intended audience (learners)--or have the potential to become interesting? How might you make it interesting to your intended audience?)
   Students are very interested in those things that affect them on a daily basis. With the issue of global climate change, there are many issues that arise to affect the student's daily lives including energy resources, human impact on the environment, loss of species/loss of possible health resources, changing hazards of weather that impacts where students live and the possible impacts to the world as a whole.

3. **Accessibility: (**What are 2-3 specific examples of resources related to the topic that are available?)
   Smithsonian conference speakers and materials, NOAA, National Science Foundation, textbook (has some resources), internet and discussion blogs.

4. **Connections: (**How does the topic relate to other topics in the discipline, to other disciplines, and beyond the disciplines to life in the world at large?)
   See Centrality comments above.

5. **Challenges:** (Describe what may be potential "troublesome knowledge"-- challenges for your intended audience in understanding this topic and how you might design the project/unit to address likely challenges.)
   For students in the middle grades, the challenge usually is getting them to collect a variety of credible points of view and evidence to support their argument. Providing specific resources, after the Smithsonian conference will help them organize what they are looking for. Also, providing/modeling how a scientific debate is held will help them put their own arguments together before they have to present them.

YOUR SUMMARY REFLECTION: (Briefly summarize major points from your analysis of your Generative Topic [above, 1-5]. Using some of the points above, explain why this is a strong Generative Topic for your unit/project.)

Central to scientific reasoning is the ability to discern fact from fiction, logical from the illogical, observation from conclusions, science from pedestrian opinions. The debate about climate change has gained traction in recent years and offers opportunities for fostering critical thinking skills and engaging civic-mindedness that can be applied beyond this single issue to other issues associated with all science disciplines.

We want students to be able to analyze and formulate a world view that is based on evidence, especially as they tackle other events that come up in their daily lives. Additionally, we want students to be able to select and analyze specific types of evidence (maps, data tables, charts, "experts") and develop thoughtful explanations for the possibility of global climate change. We also want students to be able to communicate their conclusions using sound reasoning and marshalling evidence to support their position.

UNIT/PROJECT-LEVEL UNDERSTANDING GOALS [UGS] (Write three or four goals specific to your particular unit/project. Your unit/project Understanding Goals will eventually lead you to design three to five… Performances of Understanding aimed to help learners reach your Understanding Goals).

UG 1	**UG 2**	**UG 3**	**UG 4**
Question: What constitutes a reasoned, scientific response to headline news and what is the benefit of such an approach? **Statement:** Learners will understand that… stories in the media can be approached with thoughtful reasoning and analysis.	**Question:** What evidence exists that supports and refutes the current theories of global climate change? **Statement:** Learners will understand that… research data exists and can be accessed and analyzed in order to form a reasoned, scientific conclusion about global climate change.	**Question:** What credible evidence (video, physical, scientists, internet) can be utilized to create a compelling argument for/against global climate change? **Statement:** Learners will understand that… they can develop a product that includes specific credible evidence with proper references that supports their conclusions about an issue associated with global climate change.	**Question:** What can I do as a student locally to respond to global environmental concerns? **Statement:** Learners will understand that… they can create a role for themselves and others in developing incremental, local changes to improve global conditions.

PERFORMANCES OF UNDERSTANDING [POU]…..... AND…… ONGOING ASSESSMENTS

UNDERSTANDING GOALS (Write the number of which unit/project-level Understanding Goal or Goals are targeted by each Performance of Understanding? E.g., UG1, or UGs 3 and 4)	PERFORMANCES OF UNDERSTANDING (What will learners say, do, or make to learn your Understanding Goals and to demonstrate that they understand your Understanding Goals?)	ONGOING ASSESSMENTS How will you know learners understand? What evidence/criteria should an assessor be looking for in "high quality work/thought in EACH performance?" Give a few examples of what an assessor might predict that learners will do or say or what criteria an assessor might use to assess learner understanding (products, presentations…) in "high level" work for EACH of your Performances? Let the questions below help in the design of your assessments.
UG1	**Introductory Understanding Performances #1:** Students will collect, share and view a variety of cartoons that have been published regarding global warming and climate change. Students will share their cartoon with their groups and class and then write a brief reflection about what they think about what has been portrayed in their science notebook. As an option, the class could collect data as to the number of cartoons "lampooning" global warming and the number that do not – graph results.	**Who** is the assessor? Students will assess each others cartoon offering through their reflection in their science notebook. The teacher will assess that each student has reflected in their notebook. **Where** does the assessor look? Science notebook **How** is the assessor looking (formally, informally)? **What** is the assessor looking for—CITERIA for a high level of understanding? Summary of main idea of cartoon, depth of thought connected to evidence supplied by the cartoon, personal point of view of the cartoonist is explained.
UG1 & UG2	**Introductory Understanding Performances #2:** Students will view several contrasting video clips that have speakers present their evidence and point of view regarding specific aspects connected to the issue of global warming and climate change. As they view the presentations, they will take notes in their science notebook for future reference, as well as record their references in correct MLA style. Students will develop several questions they have about what has been presented.. Questions will be used to guide research.	Who? Students and teacher Where? Science notebook How? Informally – notes will be used later What? Complete & accurate notes, correct format of bibliography, at least 3 questions generated regarding the viewpoints presented.
UG 1-3	**Guided Understanding Performance #1** Students will read and review a pro and con article from provided websites Using the "read and reflect" directions/rubric that is provided, they will summarize and state/support their own point of view. In addition, students will collect and graph data from their peers (survey) as they present the pros/cons they have outlined.	Who? Teacher and students Where? Notebook, survey data and graphs How? Formally – reflection will be graded with a reading/reflection rubric. Survey results will be graphed with a written analysis. A rubric will be used to assess proficiency. What? See various rubrics

UG 3-4	**Guided Understanding Performance #2** Students will conduct a home "carbon" footprint analysis and then ask/interview parents to develop a "carbon" footprint connected to one of their parent's job.	Who? Teacher and student Where? home How? Formally - Home carbon footprint assignment What? complete and written analysis of results
UG1 - 3	**Guided Understanding Performance #3** Students will participate in the Global Climate Change presented by various scientists working within the Smithsonian Institution. They will use the questions they have generated as a lens through which to listen to presentations. Students will continue to gather information for their notes and to support their pro/con stance regarding global warming and climate change.	Who? Teacher and students Where? classroom (online conference) How? Informally - notebook What? Notes for each session, written analysis of what was learned
UG 1-4	**Guided Understanding Performance #4** Students will read and review a series of ideas that are presented in The Atlantic Monthly article about various solutions proposed to deal with the issues associated with global warming and climate change. Students will then create a labeled drawing that explains the solution they have chosen to highlight from the reading.	Who? Teachers and Students Where? classroom/home How? Formally – reading/reflection rubric and the ICAN do Quality Work in Science product rubric What? See rubrics
UG 1-4	**Culminating Understanding Performance #1** Students will be able to develop a product (e.g., ……) that includes specific evidence with proper references that supports that conclusions about an issue associated with global climate change. The product should include a) a specific issue associated with global climate change, b) the evidence that supports and/or refutes the idea that climate change has contributed to this issue, c) visual representations of the data/evidence, d) at least three relevant and credible references, e) the student's written analysis of evidence and conclusions.	Who? Self, peers and teacher Where? Student will self-assess their product with the provided rubric and then pair-share assess. Time will be given to allow students to revise their product in light of feedback before the final evaluation. After student completes presentation, then teacher will assess. How? Informal assessment as product is developed and formal assessment after product is presented using the same rubric. What? See rubric
	Culminating Understanding Performance #2 Students will create the ECOTOWN to reduce global warming as much as possible using the website provided. After completing their town, students will share their town with their peers and compare the solutions they chose for their town.	Who? Self, peers and teacher Where? Student will self-assess their product with the provided rubric and then pair-share assess. After student completes presentation, then teacher will assess. How? Informal assessment as product is developed and formal assessment after product is presented using the same rubric. What? See rubric