

Breakout 2A

Essential Principles Breakout - Group 2A (10:30 a.m., 27 November 2007)

Group Participants: Sarah Wise (Facilitator), Kristin Conrad (OPL), Ted Willard (Project 2061), Steve Ackerman (U. Wisc.), John Snow (Dean, Atmos. Sci. U. of OK), Frank Niepold (NOAA), Chris Donovan (Teacher), Janelle Alvarez (Teacher), Anne Corn (NASA Fellow/teacher), Leslie Smith (Board of Ed, BVSD), Ula Pearson ()

--- please note that OPL may not have spelled names correctly!

Introduction: Hello, online participants. My name is Kristin Conrad, and I will serve you as group 2A's Online Participant Liason (OPL). I will both capture the gist of the discussion, and will relay selected comments from online participants, back to members of this breakout session. We hope that you will enjoy and participate in this important discussion.

NOTE: Please refresh your browser (PCs use F5 key; Macs use function+F5) every 30 - 60 seconds to view the most recent comments.

BEGIN BREAKOUT SESSION REPORTING

The goal of the breakout session is to define 6 to 8 draft **Essential Principles**. Discussion this afternoon will achieve a consensus among the drafts from the breakout groups, on 6 - 8 final Essential Principles. Tomorrow's sessions will further define 4 to 5 **Fundamental Principles** for each Essential Principle. This will be roughly parallel to the **7 Essential Principles for Ocean Literacy**. The approach is inherently interdisciplinary.

Discussion - Still unresolved is the relationship between Atmospheric Science and Climate. Are they coupled or separate. Do we need to resolve this first? John Snow felt that the EP (Essential Principles) are very high-level and can be decided without resolving the relationship. Decision was to start, and see which issues require this definition.

The group is now throwing out ideas for fundamental topics. Energy, Sun, Temperature, Composition, Water in Atmos., Human Interactions? What if we tie climate topics to how these tie to human activities? Should students understand the topics in pure science terms (separately), or in connection with human interaction?

The broad topic should focus on the atmosphere and as the group gets into the smaller scale interactions of atmosphere, climate discussions will come into play. The group should focus on the broad, atmospheric science topics. To do this, ask the question: What is it that we want the public to know? (brainstorming)

- The Atmosphere makes life possible
- Life on Earth is submerged in the atmosphere
- Humans have an impact on the atmosphere
- Living things (including humans) affect the atmosphere
- The atmosphere recycles on different timescales
- The relationship of the Earth to the Sun allows life to exist
- Fundamental assumption that the atmosphere is made of matter, has a composition that influences living things
- Predictability: cycles of the sun, for instance
- Water: Water is the most important variable component in the atmosphere
- Oxygen is another
- Circulations on different scales
- The atmosphere's composition and behavior is intimately tied to our solar system's behavior and energy
- The composition of the atmos. is variable (per the effect on prediction).
- Dynamic nature of the atmos. is different that the variability of the atmos. Influences predictability. Variables are specifics whereas dynamic nature is "why is it hard to predict weather beyond 3 days..."
- Atmosphere is 3-dimensional
- Why are there forecast windows where we have much more accuracy than others?
- Science for All Americans (book). First chapter provides guidance.
- The nature of science: How to communicate to the public how science works... Scientists are comfortable with a degree of uncertainty and theory and the public wants concrete answers
- Energy dynamics involved in atmosphere - specifically the sun (people don't understand solar impacts)
- The forecast problem: atmos. described by basic Newtonian principles and behaves according to physical laws that we know.

There is now further discussion about the charge of this group. Group is charged with what to teach; not how people use this science to make decisions (i. e. weather forecasting, etc.).

Sarah Wise (facilitator) asks if the group is now ready to find the common denominators in the list. The OPL (Kristin) will now revise the list below according to group discussion.

Discussion now revolves around "thinking about the intended audience", as we draft these principles. Example of a teacher given that wording she has used has turned off students from the very beginning (i.e. Energy Budget). Others feel that is a point for later "wordsmithing", but point well-taken. Agreement on simplicity of language in final Essential Principles.

Now there is a discussion about keeping the discussion of energy very broad and not focusing specifically on the Sun. The nuances of what wording teachers use to teach is dependent on needs of the classroom.

Again with specifics, there is a discussion of whether to use specific words like "weather", "climate", as opposed to broad terms like "energy" or "dynamics".

***** Here is a list of keywords the group agrees upon to draft the Essential Principles**

KEYWORDS

- composition
- energy/sun
- dynamics
- predictability
- follows physical laws
- water
- life and/or human impacts
- scale (temporal & spatial)

DRAFT - DRAFT - DRAFT: COLLECTION OF ESSENTIAL PRINCIPLES (group 2A) LISTED HERE --- These are DRAFT only and currently being discussed

1. Life, Composition -- The atmosphere makes life on earth possible
2. Dynamics/Predictability -- The atmosphere is a variable, dynamic and complex system
 - 2a. We can observe, measure and study the atmos. in order to make predictions and understand it (addresses the way science works in regard to dynamics/predictability)
3. Life -- Living things, including humans, affect the atmosphere (both positive and negative, according to one's perspective)
4. Water -- The cycling of water has profound affects on the atmosphere (e.g. weather...)
5. Energy -- The cycling of energy through the atmosphere has profound effects
6. Scale -- The atmosphere operates on different temporal and spatial scales
7. Composition -- ...is evolving/not static,
8. Dynamics -- The atmosphere is part of a larger system and has connections to ocean, geological systems, climate systems, etc

Now the group is taking 2 minutes to silently review these 7 statements and come up with their own wordsmithing and edits. Below, I will write the agreed-upon wording that Group 2A comes up with:

COLLECTION OF EDITED ESSENTIAL PRINCIPLES (group 2A) LISTED BELOW:

1. The atmosphere is a variable, dynamic, and complex system.
 - The atmosphere is mixture of gases with measurable properties
 - Layers
 - Chemical composition
2. The atmosphere is one of many earth systems and interacts with these other systems.
 - Ocean
 - Geological
 - Climate
3. The atmosphere makes life on earth possible.
4. Living things, including humans, affect the atmosphere.
5. The cycling of water through the atmosphere has profound effects on it precipitation.
6. The cycling of energy through the atmosphere has profound effects on it.
7. Changes in the atmosphere take place on a wide range of spatial and temporal scales.
 - The atmosphere is made of many components that change over temporal and spatial scales.
8. The atmosphere can be studied and understood.

The breakout session has now ended.