

Breakout 5A

Essential Principle: *The atmosphere has a thin atmosphere that sustains life.*

Group Participants: Sarah Wise (Facilitator), Kristin Conrad (OPL), Julie Gustafson, Mark Franson, Parker Pennington, Cinthia Haymond, John Snow, Ira Gear, Wendy Abshire, Blanch Meeson, Roberta Johnson, Sarah Shettinger, Susan Innis

Introduction: Hello, online participants. My name is Kristin Conrad, and I will serve you as group 5A'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

This group is discussing the first Essential Principle: ***The Earth is surrounded by a thin atmosphere that sustains life.*** Fundamental (or supporting) concepts are being discussed in this session. We will come up with a list which will be further discussed by another breakout group in a later session. Some of these concepts will then fit more than one EP or could be moved to more appropriate EPs.

Discussion is that this EP needs rewording. It sounds like the Atmos. is separate from the earth. Suggested -- ***The atmosphere HAS a thin atmosphere that sustains life.*** The group agrees with this rewording, and I have changed the session title, above.

Fundamental Concepts support teaching concepts for the EP and can be "unpacked" as appropriate for grade level.

Brainstorming Session on the Fundamental Concepts supporting this EP

- how is the atmosphere staying around the Earth?
- **air is real, air has mass and composition**
- what is in the atmosphere?
- there is history of how the atmosphere came to be
- atmosphere has structure and is related to the concept of composition
- what does the piece that sustains life have to do with this EP
- oxygen, nitrogen, stratospheric ozone, and greenhouse gases sustain life on Earth and are part of energy and material cycles (attempt to get more specific...)
- above explains why Ozone is good "up there" but bad for us "down here". Everything has its proper place and balance
- should be more general in tackling the "life piece" -- life develops and is sustained by components of the atmosphere
- composition of atmos. has evolved in response to forms of life, and vice versa - a reciprocal relationship exists
- Structure & Composition
 - temperature structure is a critical piece of telling the story of the atmosphere. This brings us to a discussion of dynamics, which is part of another Essential Principle
 - - clouds
 - dynamics
 - kinds of motions in various parts of atmosphere
 - height of jetstream
 - pressure
- presence of water vapor is atmospheric constituent that...
- **The atmosphere is a mixture of gases with minute quantities of liquid and solid particles**
- The atmosphere has weight and is bound to Earth by gravity and is detectable by pressure
- Earth's current atmosphere makes the planet surface habitable for human life (this is a sub-bullet of the main EP)
 - current habitability
 - past evolution and habitability

Discussion: What should get me excited as a citizen or student about these concepts? Make connection between Fundamental Concept and the public's interest and what they know about these issues... How does this wording pull people into "what decision should I make today?"

But this is intended to guide teachers with guidance. Maybe it is a further step to word these for society?

Public does need to know what happens in, for example, the Troposphere, Mesosphere, etc. But will they get excited about this wording. There is a need to word this for different audiences and unpack this differently, as needed.

DRAFT Fundamental Principles are now being discussed from the brainstormed list and will be written, below.

DRAFT Fundamental Principles

1. Atmosphere is a mixture of gases with minute quantities of liquid and solid particles
2. Atmosphere has weight and is bound to Earth by gravity
3. The atmosphere is thin but has an ordered structure. (discussion - should not push the concept that atmosphere is composed of static, unchanging "layers"; should words like "structure" and "thin" be in here; should word "unique" be in here... This concept requires further effort)

- ordered structure that varies in space and time
- structure gives rise to dynamics
- varies in composition from place-to-place and over time
- changes vertically due to weight and gravity, most dense at bottom
- varies both vertically and horizontally
- variability and non-uniform nature of atmos.

4. The atmosphere's composition varies from place-to-place and time-to-time (variability concept)

5. Current atmosphere makes life on Earth inhabitable (life concept)

- Reciprocal concept - life changes atmosphere and atmosphere affected by life
- atmos. and life have co-evolved to make life
- humans versus other life are a sub detail
- ...makes regions of the Earth inhabitable...

Online Viewers: Please use the "Add Comments" button below to add your comments and suggestions.