Teaching Climate Science to Elementary School Students using the NGSS

What Children and Their Teachers Need

Kim Cheek

- Teach science methods for elementary majors and combined science/mathematics methods for early childhood majors
- Taught 3rd-8th gr. for 11 years
- In-service teacher professional development (elementary and middle school)

Overview

- What children need
- What teachers need

What Children Need

Analyze & Interpret Data

Develop & Use Models

ESS2: Earth's Systems

Construct Explanations & Design Solutions

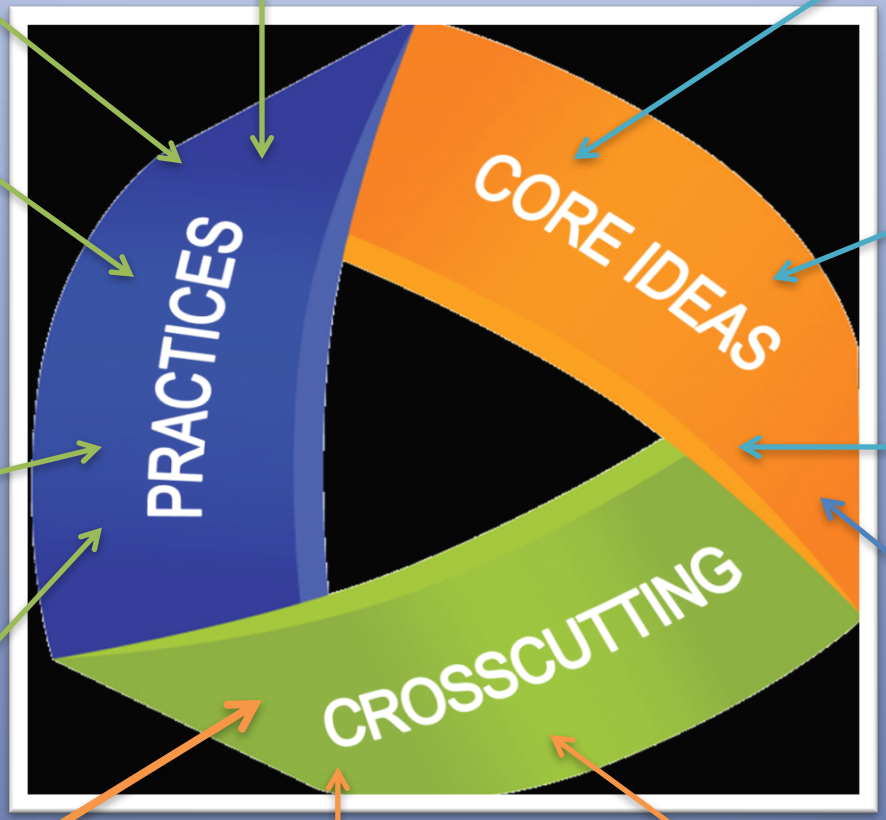
ESS3: Earth & Human Activity

Engage in Argument from Evidence

PS3: Energy

Obtain, Evaluate, & Communicate Information

LS2: Ecosystems: Interactions, Energy & Dynamics



Patterns

Cause & Effect

Systems & System Models

Core Ideas

- ESS2: Earth's Systems
- ESS3: Earth and Human Activity
- PS3: Energy
- LS2: Ecosystems: Interactions, Energy, and Dynamics

- Use bridging analogies—challenge of *experience* and *scale*

Science and Engineering Practices

- Develop and use models
- Analyze and interpret data
- Science talk practices (6-8): construct explanations, argue from evidence and evaluate others' arguments

- Use sentence frames
- Practice with familiar examples

Sample Sentence Frames

- My claim is _____.
- My evidence is _____.
- My evidence supports my claim because _____.

Crosscutting Concepts

- Patterns
- Cause and effect
- Systems and system models

What Teachers Need

Understandable Explanations

Help to "See" Climate Science in Curriculum

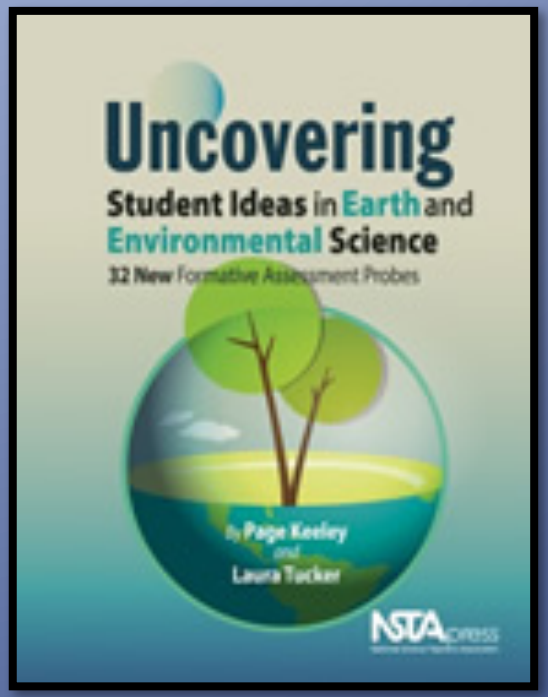
How to Connect to Other Subjects

How to Integrate SEPs and CCs

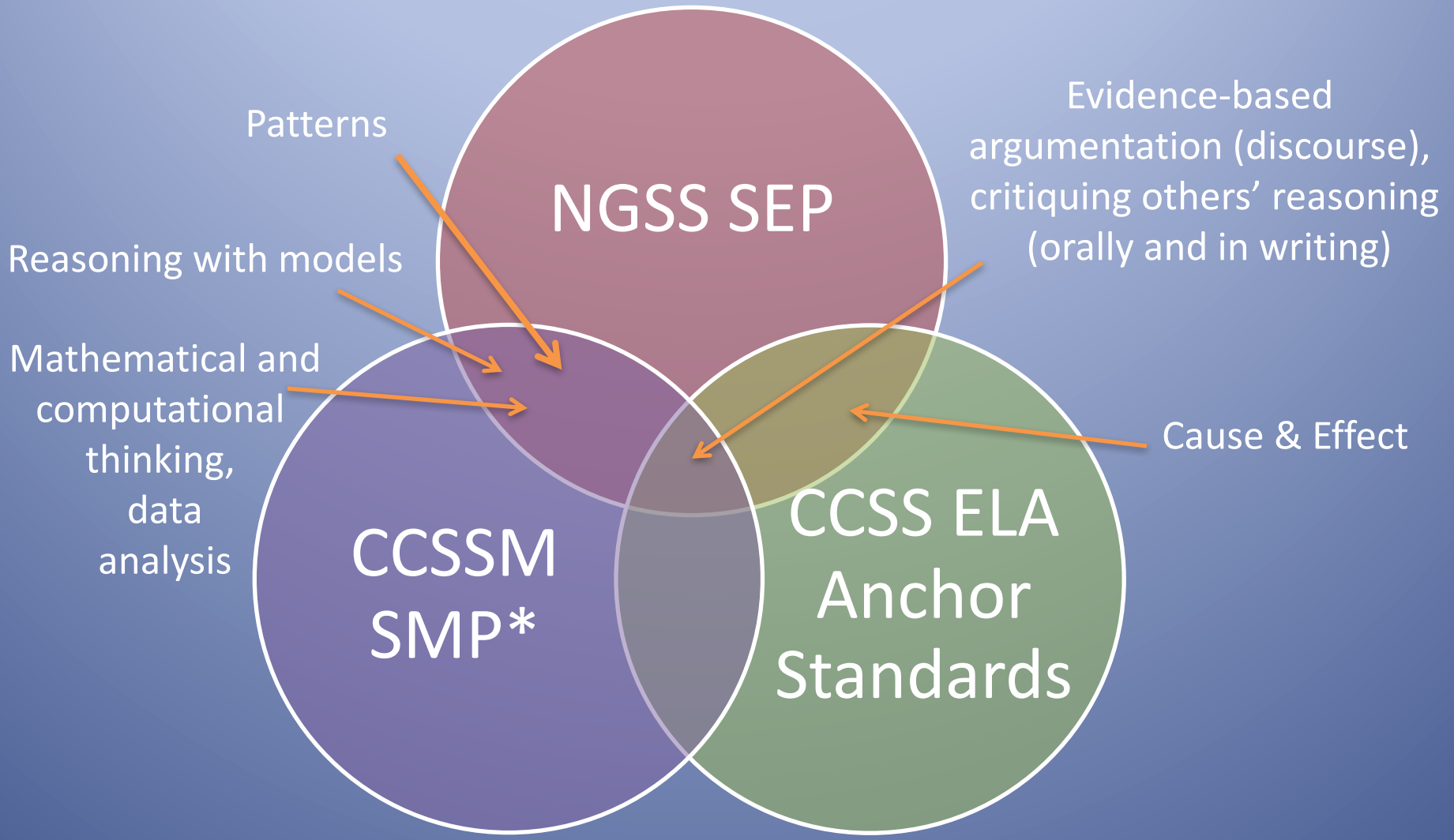
Materials and Instructional Support

Content Knowledge: Alternative Conceptions and "Seeing" Climate Science

- Typically few science courses
- Use formative assessment probes
- "Some children think…."
- Climate science connections to what I already teach

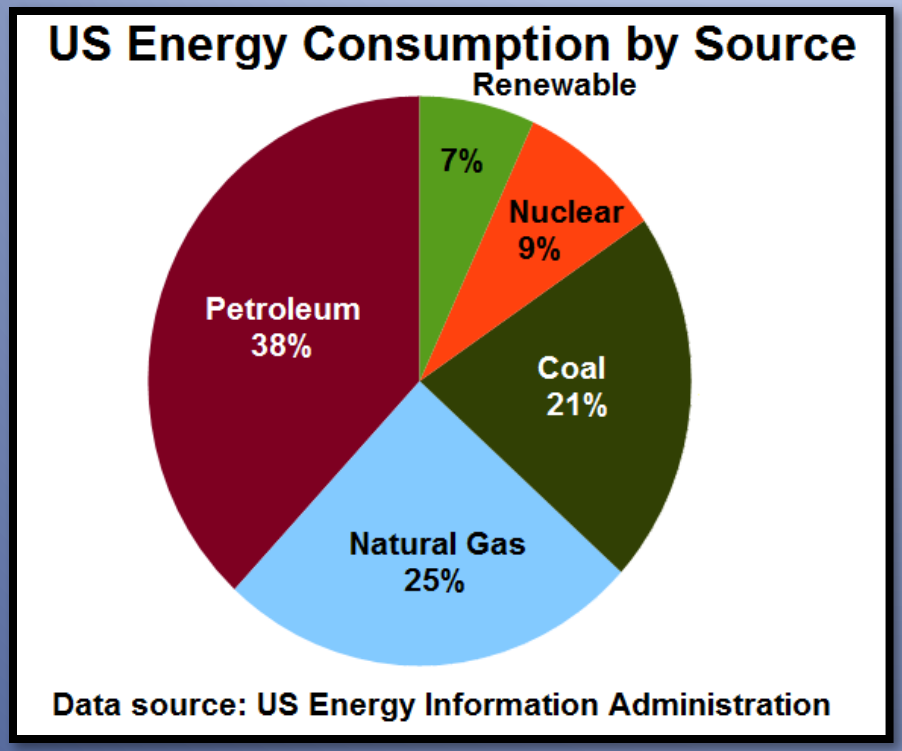


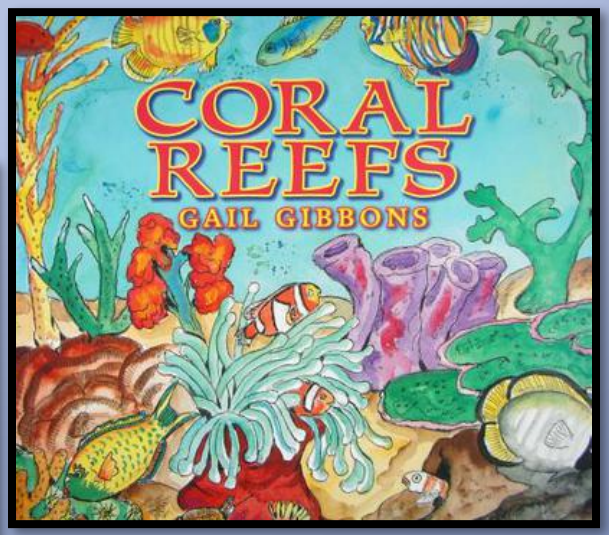
Connect to the Common Core

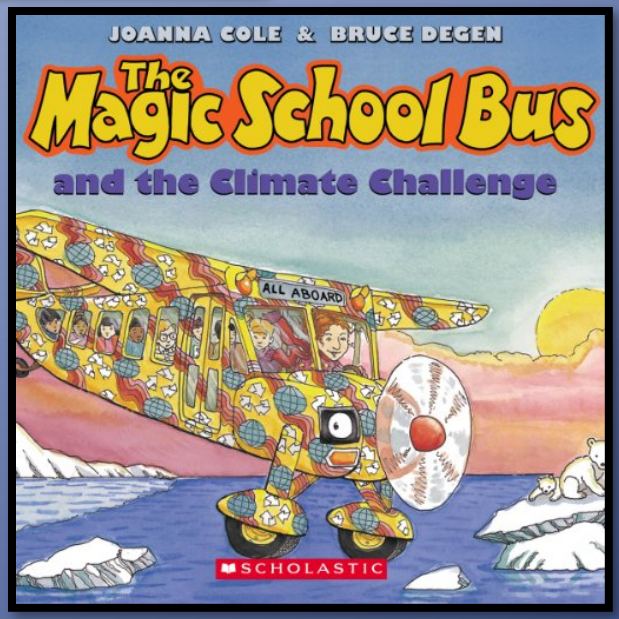


*SMP= Standards for Mathematical Practices

Connect to Other Subjects







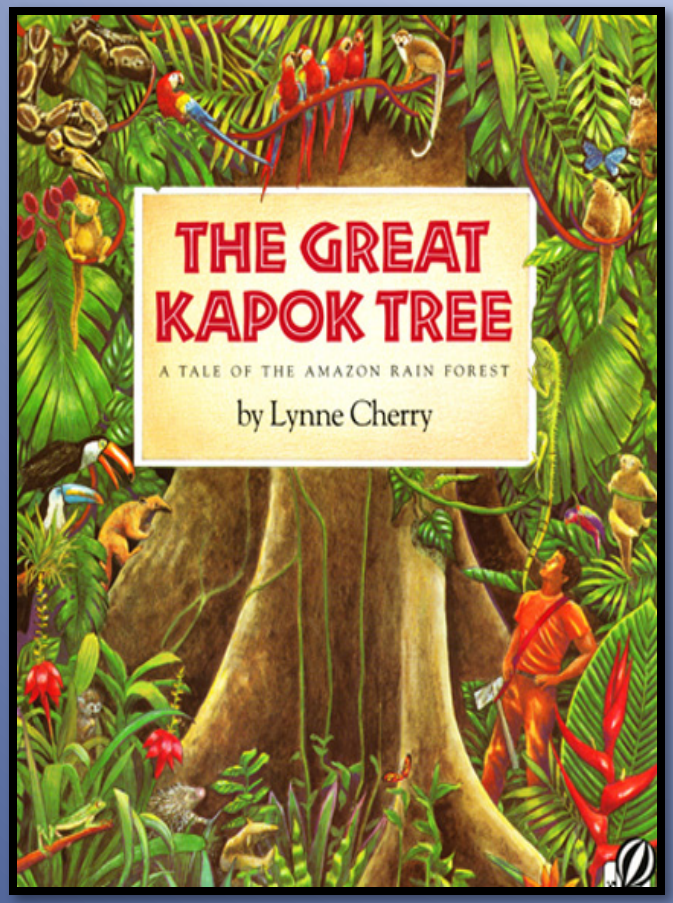
Integrating SEPs and CCs

- Use NGSS bundles as starting point

Kg. Topics Bundle		
How do objects move and what happens when they interact?	What is the relationship between the needs of different plants and animals and the places they live?	What can we observe about sunlight?

- Make integration explicit and topic-specific

Materials and Support for Teachers



- Infrastructure for dissemination and instructional support
- Short, online video clips from real classrooms
- Recording sheets, relevant children's literature
- Make It-Take It workshops

Questions?

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