

Crosscutting Concepts: What Do They Look Like in an Elementary Classroom?

Fall 2014 NSTA
12:00 p.m. – 1:15 p.m.





Goal



- Explore the ways FOSS provides students with opportunities to utilize crosscutting concepts to deepen their understanding of science content.



Agenda

- Experience 3 investigation parts from the 3 third grade FOSS modules.
- Use the crosscutting concepts to deepen understanding.
- Discuss the ways students progress in their understanding of the crosscutting concepts.



Full Option Science System



FOSS is a complete, modular, research-based curriculum developed at the Lawrence Hall of Science with support from the National Science Foundation.



Overview of FOSS Next Generation

All FOSS ©2012 Complete Kits Include:

- 1 Teacher Toolkit
- 32 *FOSS Science Resources* books
- 1 *FOSS Science Resources* big book (K-2)
- Equipment kit for 32 students; 2 class uses
 - Measurement tools included in kits!
- Access code for FOSSweb content
 - Teacher Prep Videos on FOSSweb only





Crosscutting Concepts

Cause and Effect

Patterns

Structure and
Function

Systems

Scale

Change and
Stability

Matter and
Energy



Activating Prior Knowledge

- What is the importance of the crosscutting concepts?
- What are you already doing that relates to the crosscutting concepts?



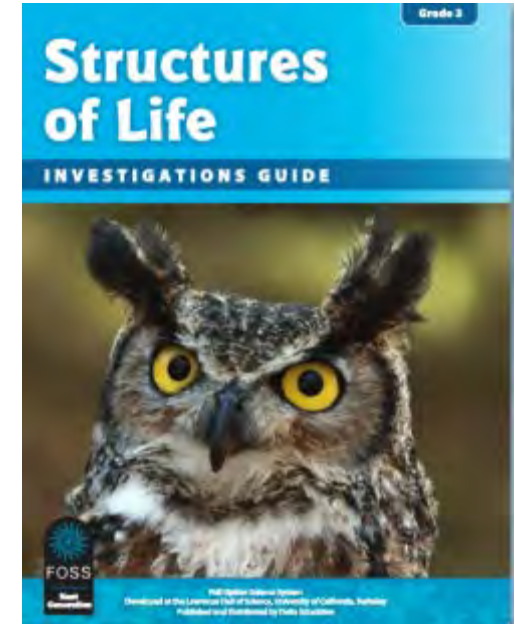
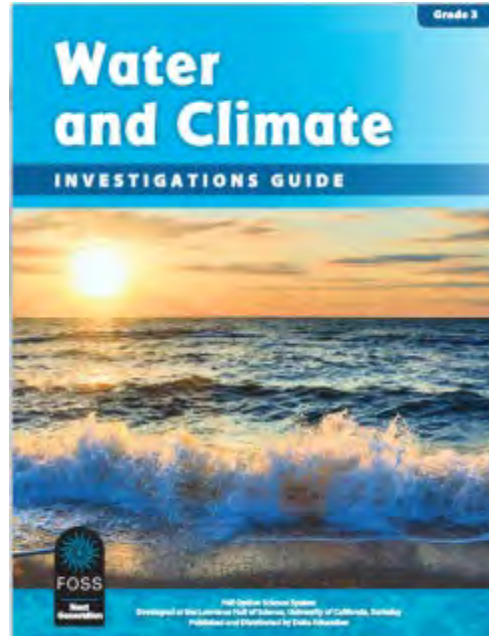
Crosscutting Concepts

- *Crosscutting concepts have value because they provide students with **connections** and **intellectual tools** that are related across the differing areas of disciplinary content and can **enrich their application of practices** and their **understanding of core ideas**.*

(NRC Framework, 2012, p. 233)



FOSS Next Generation Modules



Stations

- Rotate through 3 stations
- Wait for the signal before rotating
- Use the recording sheet to note the relationship to the crosscutting concepts



Wrap-up

- How did using the perspective of the crosscutting concepts deepen understanding of the core science ideas?
- Twirly Bird Example: Forces and Motion
 - Twirly birds create motion from the interaction of the forces of gravity and air resistance.
 - Twirler performance is affected by variables including wing size, shape, and angle.



Wrap-up

- How did using the perspective of the crosscutting concepts deepen understanding of the core science ideas?
- **Cause and effect:** Forces cause change of motion than can be observed and predicted.
- **Patterns:** Moving systems display patterns of motion that can be used to make predictions



Wrap-up

- How did addressing the crosscutting concepts help build understanding of the science and engineering practices?
 - **Asking questions and defining problems**
 - Developing and using models
 - Planning and carrying out investigations
 - **Analyzing and interpreting data**
 - Using mathematical and computational thinking
 - **Constructing explanations and designing solutions**
 - Engaging in argument from evidence
 - Obtaining, evaluation, and communicating information





Crosscutting concepts for all

- Crosscutting concepts provide a common framework on which to anchor new scientific understanding.
- Using overarching concepts is effective for English Language Learners and diverse learners.

Introducing Teachers and Administrators to the NGSS, 2014

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<http://www.fossweb.com>

