

Learning Biology Through Global Issues

Maia K. Willcox

SEPUP

Lawrence Hall of Science

Berkeley, CA

NABT Friday, October 17

Why use issue-oriented science?

- **Science for all students.**
- **Integrates sciences and integrates science with other subjects.**
- **Makes real-world connections and shows students how science is useful in many careers and in daily life.**
- **Encourages and prepares students to use scientific evidence to make decisions.**

Issue-oriented Science and Inquiry

Less Emphasis On	More Emphasis On
Discussing science in isolation	Discussing science concepts and understanding in the context of personal and societal issues
Working alone	Working with a group that simulates the work of a scientific community or policy group
Acquiring scientific information	Acquiring conceptual understanding and applying information and conceptual understanding in making personal, societal, and global decisions
Testing students for understanding at the end of the unit	Embedded assessments throughout the unit and culminating assessment activities
Closed questions with one correct answer	Open-ended questions that require students to explain phenomena or take positions backed by evidence

How to use issue-oriented science

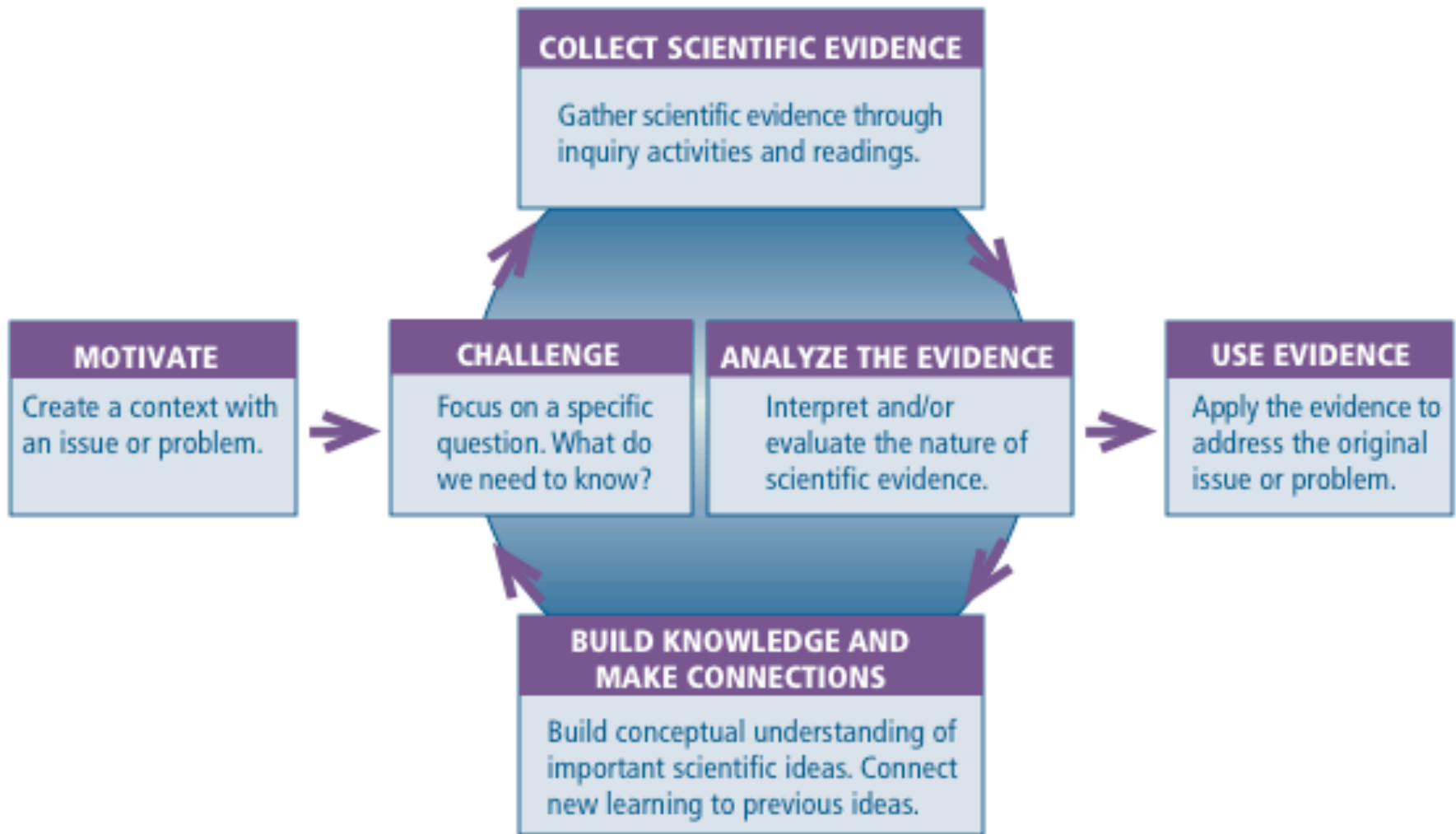
- Weave into the curriculum, do not add-on
- Be sure the issues and content are closely related.
- Try to advocate the use of scientific evidence and concepts in the decision-making process, not a particular decision.
- Encourage students to look at both sides of an issue and evaluate the trade-offs involved in a complex decision.

Evaluating issues

The strongest issues:

- Require knowledge and understanding of important scientific concepts and processes
- Require an application of relevant scientific evidence
- Relate to scientific concepts and processes appropriate to grade level and subject matter
- Engage diverse groups of students
- Are complex enough to foster discussion and debate (Is there more than one solution or response?) OR clearly illustrate how science can inform a decision.

Instructional model for issue-oriented science



Literacy and assessment strategies are tied to issues

- Literacy strategies
 - Discussion strategies
 - Writing strategies
 - Reading strategies
 - Concept building strategies
- Assessment
 - Conceptual Understanding
 - Analyzing Data
 - Evidence and Trade-offs
 - Group Interaction

Science in Global Issues

Issue-Oriented Science

- **In SGI, the theme of sustainability and global issues related to this theme unify the program.**
- **Ecology: Living on Earth**
 - fisheries and fishery management
- **Cell Biology: World Health**
 - global infectious diseases

Energy Traveling Through the Kelp Forest - An Issue-Oriented Activity

- Issue: Sustainable Fisheries
- Biology Content: Energy flow through an ecosystem
- Unit Context: Ecology unit, Activity 6, population dynamics and producers/consumers already covered

Contact Information

Maia K. Willcox

SEPUP - Lawrence Hall of Science

mwillcox@berkeley.edu

(510) 642-8718

<http://www.lawrencehallofscience.org/sepup>