Resources

Transforming Agricultural Education for a Changing World
http://dels-old.nas.edu/ag_education

Strategies to Integrate Now
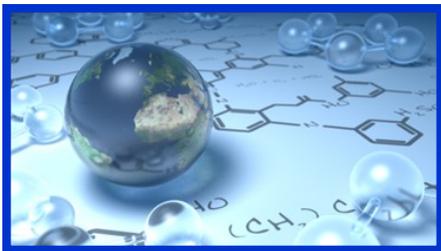www.strategiestointegratenow.com

Achieve, Inc.
www.achieve.org

The Curriculum Matrix
www.leadered.com/curriculumMatrix.html

States' Career Clusters
www.careerclusters.org/

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Assisting in the Movement From STEM to STEAM

The Process

1. Identify the agricultural, food, or natural resource (AFNR) concept
   - What are you teaching?

2. Identify the "enabling" core concept
   - What fundamental science, technology, engineering, or mathematics concept is required for the AFNR concept to be taught?

3. Describe the connection between the two concepts
   - How are the two concepts related?
   - Why can't one function without the other?

4. Implement the deductive model to teach the lesson
   - Follow the six steps that are included in the deductive model to teach about the AFNR concept

Example

AFNR Concept

Nutrient exchange

Core Subject Concept

Cation exchange capacity

AIMED Approach

Soils are for the most part negatively charged, due to the chemical structure of clay particles in soilds. The amount of negative charge on a given soil depends upon the amount the type of clay minerals present and the organic matter content. The total amount of negative charges in the soil can be measured and is called the cation exchange capacity. The net negative charge in the soils is permanent and is not changed by the addition of fertilizers . Higher soil pH tends to enhance this negative charge. Nutrients exist in the soil as ions (electrically charged atoms or group of atoms). Thus, soils act as a cation exchanger and will attract positively charged cations such as Ca 2+, Mg 2+, and K+.

Reference

Buriak, P. & Osborn, E.W. (1996). *Physical science applications in agriculture*. Danville, IL: Interstate Publishers, Inc.

The Deductive Model
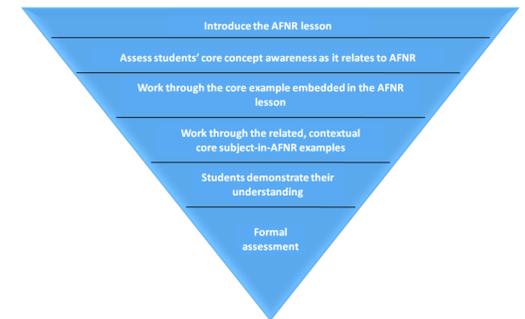
1. Introduce the AFNR lesson
2. Assess the students' core concept awareness as it relates to AFNR
3. Work through the core example embedded in the AFNR lesson
   - Review the core concept in its original context
4. Work through the related, contextual core subject-in-AFNR examples
   - Provide examples of how the core subject concept and the AFNR concept are related and rely upon each one another
5. Students demonstrate their understanding
   - Ask students to explain the relationship between the two concepts in the AFNR context, this could be done multiple ways (i.e. group discussion, written summary, short answer quiz, group work)
6. Formal assessment
   - Include questions on tests and quizzes in regards to the relationship between the two concepts