A Model of the Three Dimensions of Science Learning

Adapted from: Houseal, A. (2015). A visual representation of three-dimensional learning: A tool for evaluating curriculum. Science Scope 39 (1): 58-62.

Disciplinary Core Ideas (DCIs) CONTENT

- Life Sciences
- Physical Sciences
- Earth and Space Sciences
- Engineering, Technology, and Applications of Science

Integration of content and big ideas

Integration of content, process, and big ideas

Integration of content and process

Cross Cutting Concepts (CCCs) BIG IDEAS

- 1. Patterns
- 2. Cause & effect
- 3. Scale, proportion, and quantity
- 4. Systems & systems models
- 5. Energy & matter
- 6. Structure & function
- 7. Stability & change

Integration of big ideas and process

Scientific and Engineering Practices (SEPs) PROCESS

- 1. Asking questions/Defining problems
- 2. Developing and using models
- 3. Planning and carrying out investigations
- 4. Analyzing and interpreting data
- 5. Using mathematical and computational thinking
- 6. Constructing explanations/Designing solutions
- 7. Engaging in arguments from evidence
- 8. Obtaining, evaluating and communicating information

Reference:

National Research Council [NRC], (2012). A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas,