A Model of the Three Dimensions of Science Learning

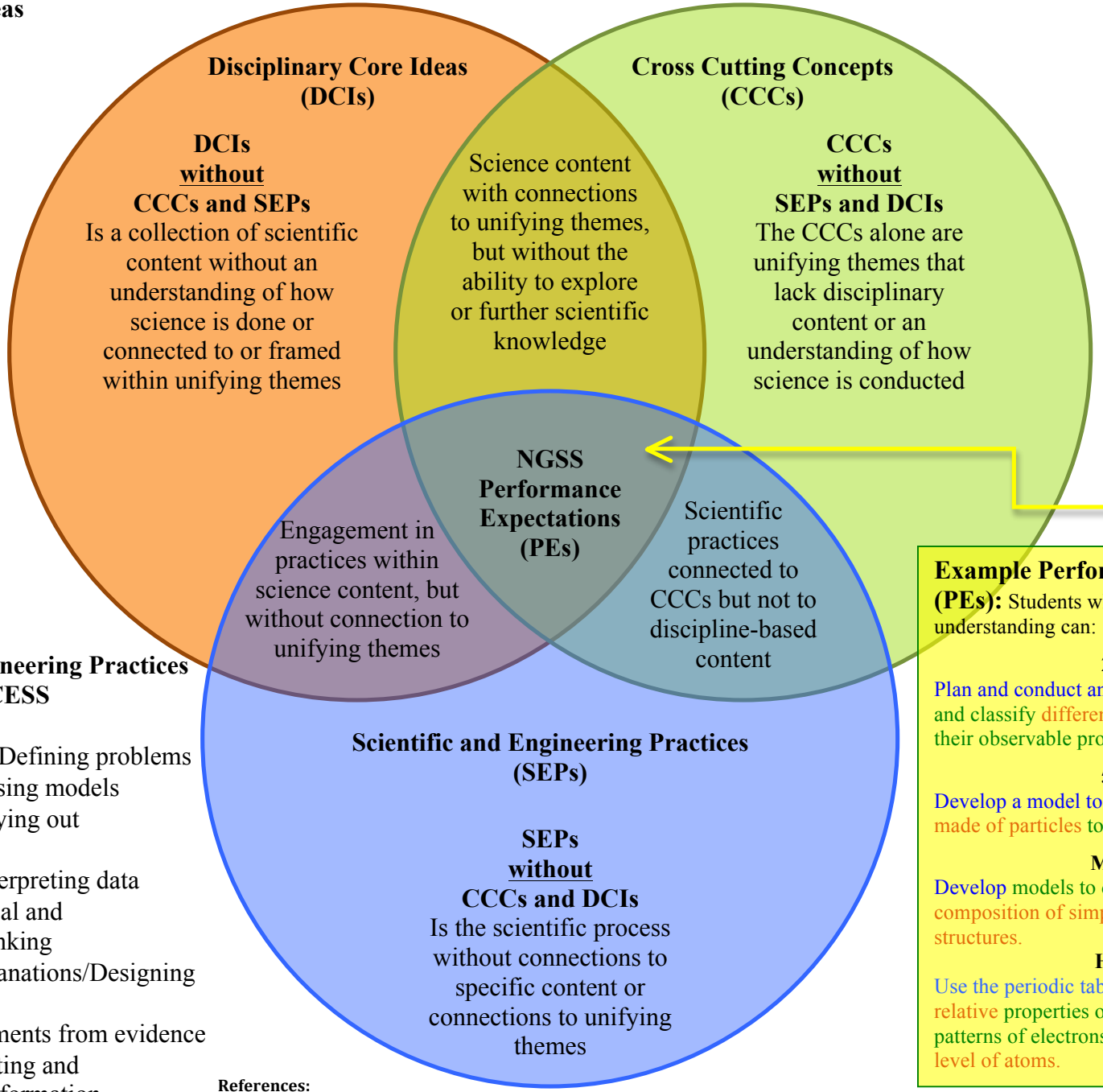
Adapted from: Houseal, A. (2015). A visual representation of three-dimensional learning: A tool for evaluating curriculum. Science Scope 39 (1): 58-62.

Disciplinary Core Ideas
CONTENT

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

Cross Cutting Concepts
BIG IDEAS

- Patterns
- Cause & effect
- Scale, proportion, and quantity
- Systems & systems models
- Energy & matter
- Structure & function
- Stability & change



THIS IS WHERE WE WANT TO BE!

Scientific and Engineering Practices
PROCESS

- Asking questions/Defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematical and computational thinking
- Constructing explanations/Designing solutions
- Engaging in arguments from evidence
- Obtaining, evaluating and communicating information

Example Performance Expectations (PEs): Students who demonstrate understanding can:

2-PS1-1.
Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

5-PS1-1.
Develop a model to describe that matter is made of particles too small to be seen.

MS-PS1-1.
Develop models to describe the atomic composition of simple molecules and extended structures.

HS-PS1-1
Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

References:
National Research Council [NRC]. (2012). *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas.*. Washington, DC: The National Academies Press.
NRC. (2013). *Next Generation Science Standards: For States, By States.* Washington, DC: The National Academies Press.