Figure - A Model of Three-dimensional Science Learning

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A Model of the Three Dimensions of Science Learning

**Disciplinary Core Ideas (DCIs)**
- Life Science
- Physical Science
- Earth Systems Science
- Engineering

**Cross Cutting Concepts (CCCs)**
- Patterns
- Cause & effect
- Scale, proportion, and quantity
- Systems & systems models
- Energy & matter
- Structure & function
- Stability & change

**Scientific and Engineering Practices (SEPs)**
- 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

**Engagement in practices within science content, but without connection to unifying themes**

**Science content with connections to unifying themes, but without the ability to explore or further scientific knowledge**

**Scientific practices connected to CCCs but not to discipline-based content**

**THIS IS WHERE WE WANT TO BE!**

**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.

**References:**
Framework for K-12 Science Education – the Three Dimensions of Science


Disciplinary Core Ideas
CONTENT
- Life Science
- Physical Science
- Earth Systems Science
- Engineering

Cross Cutting Concepts
BIG IDEAS
- Patterns
- Cause & effect
- Scale, proportion, and quantity
- Systems & systems models
- Energy & matter
- Structure & function
- Stability & change

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
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Three Dimensional Learning (PEs)

Explicit evidence of integration:

What in your unit/lesson is happening here?

References: