

## **Week 2 Notes**

### Three Dimensional Learning

NGSS Engineering Design help students develop engineering habits and vital problem solving skills. Learning revolves around student interest and phenomena of a problem.

What does it mean to be proficient in Science?

### 3 Dimensions: Practices, Crosscutting Concepts and Disciplinary Core Ideas

#### 1- Practices

- These describe behaviors that scientists engage in as they explore concepts.
- They are based of the key things that scientists and engineers do as they investigate and design models.
- They are referred to as practices because it is an ongoing inquiry that you must continue to learn and grow with.
- Scientific Inquiry- Formulate a question to investigate and explore.
- Engineering design- Formulate a problem that is solved through a design process.

#### 2- Crosscutting Concepts

- It is important to integrate concepts to help students interlace different science domains.
- Crosscutting concepts are lenses through which phenomena are studied, understood and explained.
- These can include: Patterns, similarity and diversity; Cause and effect; scale, proportion and quantity; systems and system models; energy and matter; structure and function; stability and change.
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#### 3- Disciplinary Core Ideas

- These are the core ideas that focus certain aspects of science.
- In order to be considered core ideas they should meet two criteria out of four.
  - o Criteria for core ideas
    - Broad importance across multiple sciences or engineering disciplines or at least be a key organizing component of a single discipline.

- Provide a key tool to understand or investigate complex ideas.
- Relate the interests and experience of students to a societal or personal concern that uses scientific knowledge.
- Must be taught or learned over time at increasing levels of depth and sophistication.

The goal of three dimensional science is to teach students how to design and investigate a phenomena of interest and develop a scientific mindset.

The three-dimensional process is much different than in the past. Teaching science used to be able the concepts and spent little time creating authentic learning for students. Helping them to understand when to use the skills taught.

Three dimensional teaching is more exploratory and meant to be useful to students rather than just learning concept after concept without any connections between concepts or basis of why they are being taught. It focuses more on the why than the what and creates more of an emphasis on the discovery of the content rather than a sit an get method.