

# Educational Resources from *Phenomenon Science Education*

## Student Proficiency Goals for **NGSS MS-PS1-3**



### Information about MS-PS1-3

#### **NGSS Performance Expectation MS-PS1-3.**

Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

#### **Clarification Statement.**

*Emphasis is on natural resources that undergo a chemical process to form the synthetic material. Examples of new materials could include new medicine, foods, and alternative fuels.*

#### **Assessment Limits.**

*Assessment is limited to qualitative information.*

#### **Science and Engineering Practice (Obtaining, Evaluating, and Communicating Information)**

- Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence.

#### **Disciplinary Core Idea (PS1.A: Structure and Properties of Matter)**

- Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.

#### **Disciplinary Core Idea (PS1.B: Chemical Reactions)**

- Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants.

#### **Crosscutting Concept (Structure and Function)**

- Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used.

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### Student Proficiency Goals for **NGSS MS-PS1-3**



#### Student Proficiency Goals

##### SEP (Obtaining, Evaluating, and Communicating Information):

- Students gather information from multiple appropriate sources that describe how synthetic materials come from natural resources and impact society.
- Students analyze information and sources to assess the credibility, accuracy, and possible biases of each selected publication.
- Students analyze information and sources to describe how relevant materials are or are not supported by evidence.

##### DCI (PS1.A Structure and Properties of Matter):

- Students know that different substances have different characteristic physical and chemical properties.
- Students know that synthetic materials with specific properties can be created with the intent to meet societal needs.
- Students know that synthetic materials have different properties than the natural resources from which they were derived.

##### DCI (PS1.B Chemical Reactions):

- Students know that the characteristics of a substance change when the atoms in that substance are rearranged to form a new substance.
- Students know that natural resources can undergo chemical processes to form synthetic materials.
- Students know that the results of chemical processes have positive and negative consequences for society.

##### CCC (Structure and Function):

- Students consider the physical and chemical properties of natural and synthetic materials and structures, and how those properties drive the use of materials and structures for specific functions.
- Students consider how natural resources are changed into new synthetic materials through chemical processes, and how these new synthetic materials have physical and chemical properties that are different from the original natural resources.
- Students consider how synthetic materials can be shaped and used to meet societal needs.