

OpenSciEd Massachusetts Standards Guidance

8th Grade: Chemical Reactions & Matter

This document is to provide guidance to Massachusetts 8th grade teachers who are implementing [OpenSciEd](#). This guidance assumes the OpenSciEd curriculum is being implemented across grades 6-8, following the [MA coherent sequence by grade level](#) (*download*). The following guidance identifies the MA standards addressed in the [Chemical Reactions & Matter](#) unit, and the most effective use of the OpenSciEd materials for 8th grade teachers.

Scope and Sequence Recommendation

Implement the *Chemical Reactions & Matter* unit in 8th grade as the first unit of the year, and before the *Chemical Reactions & Energy* and *Metabolic Reactions* units. *Chemical Reactions & Matter* has built-in supports for establishing OpenSciEd routines at the beginning of the year, and has significant coherence when leading into the *Chemical Reactions & Energy* unit; this pair of units foundationally address standards related to chemical reactions (PS1) and building understanding of chemical reactions across both units. *Chemical Reactions & Matter* lays a foundation for addressing life science concepts in *Metabolic Reactions*. *Chemical Reactions & Matter* addresses three 8th grade physical science standards. Refer to the [MA coherent sequence by grade level](#) (*download*) for the complete scope and sequence recommendation.

8th Grade Standards in *Chemical Reactions & Matter*

Standards in unit	Lessons building towards standards
8.MS-PS1-1 . Develop a model to describe that (a) atoms combine in a multitude of ways to produce pure substances which make up all of the living and nonliving things that we encounter, (b) atoms form molecules and compounds that range in size from two to thousands of atoms, and (c) mixtures are composed of different proportions of pure substances.	a: Lessons 1-14 b: Lessons 11-13 c: Lessons 3-5
8.MS-PS1-2 . Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	Lessons 1-14
8.MS-PS1-5 . Use a model to explain that atoms are rearranged during a chemical reaction to form new substances with new properties. Explain that the atoms present in the reactants are all present in the products and thus the total number of atoms is conserved.	Lessons 1-14

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Additional Standards in *Chemical Reactions & Matter*

Standards in unit	Lessons building towards standards
<p>6.MS-ETS2-1(MA). [Partial] Analyze and compare properties of metals, plastics, wood, and ceramics, including flexibility, ductility, hardness, thermal conductivity, electrical conductivity, and melting point.</p> <ul style="list-style-type: none"> • Why partial? This unit does not address every specified material in the standard, nor does it address every specified property listed. • Students develop an understanding of the property of “melting point” • The <i>Contact Forces</i> and Thermal Energy address additional properties of materials. No changes are recommended within this unit to address the standard. 	Lessons 3, 6
<p>6.MS-PS1-8(MA). Conduct an experiment to show that many materials are mixtures of pure substances that can be separated by physical means into their component pure substances.</p>	Lessons 3-5

See recommendations below for addressing this 6th grade standard.

Recommendations for Addressing Standards in *Chemical Reactions & Matter*

Include, and teach **6.MS-PS1-8** and **6.MS-ETS2-1(MA)** with *Chemical Reactions & Matter* as planned in the unit. The experiments that students conduct in the unit are used as the basis of the modeling and data analysis that are in the 8th grade standards for the unit. **Excluding this standard would require substantial redesign of the unit, which is not recommended.**