



**Mission:** How is the strength of a sand tower affected by its ingredients?

**Age:** 8+  
**Materials:** \$18

**Time:** 1 hour 15 min  
(Set-up: 10 min | Activity: 60 min with wait time | clean-up: 5 min)

## NGSS Alignment of Sand Structures Activity

The information below may not include every area that this activity can be linked to NGSS concepts

### Disciplinary Core Ideas

#### PS1.A: Structure and Properties of Matter

- 2nd Grade
  - Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties.
  - Different properties are suited to different purposes.
- 5th Grade
  - Measurements of a variety of properties can be used to identify materials.

#### PS1.B: Chemical Reactions

- 5th Grade
  - When two or more different substances are mixed, a new substance with different properties may be formed.

### Performance Expectations

- 2-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
- 2-PS1-2: Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
- 5-PS1-3: Make observations and measurements to identify materials based on their properties.
- 5-PS1-4: Conduct an investigation to determine whether the mixing of two or more substances results in new substances.



## Crosscutting Concepts

### System and System Models

- **Grade 3-5**
  - A system is a group of related parts that make up a whole and can carry out functions its individual parts cannot.
  - A system can be described in terms of its components and their interactions.
- **Middle School**
  - Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy, matter, and information flows within systems.

## Engineering and Science Practices

### Planning and Carrying Out Investigations

- **Grade 3-5**
  - Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.
  - Make predictions about what would happen if a variable changes.
  - Test two different models of the same proposed object, tool, or process to determine which better meets criteria for success.
- **Middle School**
  - Conduct an investigation and/or evaluate and/or revise the experimental design to produce data to serve as the basis for evidence that meet the goals of the investigation.
  - Collect data about the performance of a proposed object, tool, process, or system under a range of conditions.

### Constructing Explanations and Design Solutions

- **Grade 3-5**
  - Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation or design a solution to a problem.
  - Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.
- **Middle School**
  - Apply scientific ideas, principles, and/or evidence to construct, revise and/or use an explanation for real-world phenomena, examples, or events.
  - Undertake a design project, engaging in the design cycle, to construct and/or implement a solution that meets specific design criteria and constraints.