# Grade 2 Science - Unit 2 - Matter: Solids, Liquids, and Gases

## Unit Focus

In this exciting and hands-on science unit, Grade 2 students will explore the three states of matter—solids, liquids, and gases—through observations, investigations, and engaging class experiments. Students will become matter scientists as they observe real chemical reactions, conduct scavenger hunts, and investigate how different types of matter behave and change. Using their Study of Matter Journals, students will draw, write, and reflect on their findings throughout the unit.

From "super absorbent" chemistry to a mystery milk spill and melting ice cube races, students will deepen their understanding of the properties and behaviors of matter. They'll also learn how heating and cooling can cause materials to change—sometimes in ways that can be reversed, and sometimes not.

This unit is designed to spark curiosity, support NGSS-aligned learning, and build foundational science skills like observation, data collection, comparison, and explanation.

## Stage 1: Desired Results - Key Understandings

### Standard(s)

**Next Generation Science Standards**

Cross Cutting Concepts: 2

- Patterns in the natural and human designed world can be observed. (2-PS1-1) (2.SPM.CC.1.1)
- Events have causes that generate observable patterns. (2-PS1-4) (2.SPM.CC.2.1)
- Simple tests can be designed to gather evidence to support or refute student ideas about causes. (2-PS1-2) (2.SPM.CC.2.2)
- Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world. (2-PS1-2) (2.SPM.CC. 4.1)

Disciplinary Core Ideas: 2

- 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. (2-PS1-1) (2.PS1.A.1)
- Different properties are suited to different purposes. (2- PS1-2),(2-PS1-3) (2.PS1.A.2)
- Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. (2-PS1-4) (2.PS1.B.1)

### Transfer

*Students will be able to independently use their learning to...*

**T1** Use the scientific process to generate evidence that addresses the original questions.

**T2** Analyze qualitative and quantitative data to interpret patterns, draw conclusions, and/or make predictions.

### Meaning

#### Understanding(s)

*Students will understand that...*

**U1** Materials have observable properties that can be used to classify them.

**U2** Materials can be tested to determine which are best suited for particular purposes based on their properties.

**U3** Objects can be taken apart and reassembled into new objects, demonstrating that materials can change form.

**U4** Some changes to materials can be undone, while others result in permanent changes.

#### Essential Question(s)

*Students will keep considering...*

**Q1** How can we describe and classify materials based on their properties?

**Q2** What properties make certain materials better suited for specific purposes?

**Q3** How can materials be used, taken apart, and reused to create new things?

**Q4** How do heating and cooling change materials, and which changes are reversible or irreversible?

## Stage 1: Desired Results - Key Understandings

Performance Expectations: 2

- Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. (2-PS1-1)
- Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. (2-PS1-2)
- Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. (2-PS1-4)

Science and Engineering Practices: 2

- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-PS1-1) (2.SPM.SEP.1.1)
- Analyze data from tests of an object or tool to determine if it works as intended. (2- PS1-2) (2.SPM.SEP.2.1)
- Construct an argument with evidence to support a claim. (2- PS1-4) (2.SPM.SEP.4.1)

**Madison Public Schools Profile of a Graduate**

- Analyzing: Examining information/data/ evidence from multiple sources to identify possible underlying assumptions, patterns, and relationships in order to make inferences. (POG.1.2)

### Acquisition of Knowledge and Skill

| Knowledge | Skill(s) |
|---|---|
| *Students will know...*<br>**K1** Observable properties of materials including: color, texture, hardness, flexibility, absorbency.<br>**K2** How to collect data from tests and investigations.<br>**K3** Some changes to materials can be reversed (such as freezing and melting), while others cannot (such as burning or cooking), and will be able to identify examples of each.<br>**K4** Objects can be taken apart and put back together in different ways to create the same object or a new one.<br>**K5** Vocabulary: States of Matter, Solid, Liquid, Gas, Property, Physical Change, Chemical Change, Material, Texture, Transparent, Translucent, Absorbency. | *Students will be skilled at...*<br>**S1** Plan and conduct investigations to describe and classify materials.<br>**S2** Analyze data to determine suitable materials for specific purposes.<br>**S3** Make observations and construct evidence-based accounts of material changes.<br>**S4** Construct arguments about reversible and irreversible changes based on evidence. |