

Unit 2 - Exploring Matter: Properties, Pieces, and Changes

Pacing Guide using Mystery Science

*Informational writing standards are now being covered in science. Please use [these resources](#) to address the informational writing standards. These lessons can be incorporated at any point during the unit.

Unit & Lesson #	Focus	Standards Addressed	Day (20-30 minutes)	Overview	Writing Activities	Additional Activities
Material Magic Anchor Phenomenon Melting Metal	Materials & Properties	2-PS1-1 2-PS1-2 2-PS1-3	1	The anchor phenomenon for this unit can be found inside of a special type factory called a Foundry. Foundries are places where people melt solid metal into a liquid that can be poured into new shapes. Foundries can be dangerous places to work, so how do the people that work in foundries stay safe? During the introduction, students generate observations and questions about the phenomenon and create an initial conceptual model to explain the phenomenon. Students will gather clues during and after each lesson in	Beat the Heat See-Think-Wonder Chart	

				this unit to help them improve their explanations. It is important to encourage students to recognize that even if they don't know the perfect answer yet, they are going to learn a lot throughout the unit and will have an opportunity to change or add to their first explanation.			
Material Magic Lesson 1 Why do we wear clothes?	Materials, Properties, & Engineering	2-PS1-2 K-2-ETS1-1 K-2-ETS1-2	2	In this session, students explore the different properties of materials used for clothing, such as texture, flexibility, and absorbency			
			3	In the hands-on activity, Mad Hatter, students use this information to design and build a hat that protects them from the Sun. Wrap-up slides & teacher-led discussion.			
			4	Anchor Connection Students wonder:	<u>Science Journal</u> entry to answer anchor connection		

			How else can materials keep us safe? Students learn: When designing protective clothing, sometimes rigid materials are needed, such as in the hard hat. Other times, flexible materials are needed.	question.	
			5 <u>Lesson 1</u> <u>Assessment</u> Extensions include: Readings, videos, activities, and an online simulation.		
			6 In this session, students consider the insulating and conducting properties of different materials.		Book: <u>Do You Really Want to Burn Your Toast?</u>
		2-PS1-1 2-PS1-2	7 In the hands-on activity, Feel the Heat, students test different materials and determine which would make the best oven mitts. Wrap-up slides & teacher-led discussion.		
		Classify Materials, Insulators, Properties			
Material Magic Lesson 2 Can you really fry an egg on a hot sidewalk?					

			and paper clips. First, they build tall towers, then they are challenged to build towers strong enough to support a hardcover book. Wrap-up slides & teacher-led discussion.			
		12	Anchor Connection Students wonder: How else can we build things? Students learn: Foundries can recycle metals into raw materials that can be used to make new objects.		Science Journal entry to answer anchor connection question.	
		13	<u>Lesson 3 Assessment</u> Extensions include: Readings, videos, and discussions			
Material Magic Lesson 4 How do you build a city out of mud?	Soil Properties	2-PS1-1 2-PS1-2	14	In this session, students learn about a unique building material: mud! The properties of mud depend on the		Book: <u>Studying Soil</u>

		properties of the soil it's made from.			
	15	In the hands-on activity, Mystery Mud, students use models of sand and clay soils to investigate how the properties of soils can differ. They use their observations as evidence to classify each soil model based on whether or not it would make mud that's good for building. Wrap-up slides & teacher-led discussion.			
	16	Anchor Connection Students learn: People have to wear safety clothing in some situations and because of the properties of the materials they work with.	<u>Science Journal</u> entry to answer anchor connection question.		
	17	<u>Lesson 4 Assessment</u> Extensions include: Readings and			

					activities			
Material Magic CER #1				18	<u>CER Activity</u>			
Material Magic Unit Assessment				19	<u>Material Magic Unit Assessment</u>			
Material Magic Performance Task How do we recycle metal?			2-PS1-4	20	In this performance task, students will observe how fire can be used to recycle some materials, but not others. Some changes caused by fire, such as melting, are reversible. Other changes, such as burning, are not reversible. After a brief review of the Material Magic unit, students will record observations of the changes that metal and paper experience when they are exposed to fire. Then, they will use their observations of these changes to construct an argument about whether or not fire can be used to recycle each of those materials.	<u>Recycle with Fire</u>		

States of Matter Anchor Phenomenon Flow & Freeze	Materials & Properties	2-PS1-4	21	The anchor phenomena for this unit are a collection of strange situations that seem completely unrelated. But what do they all have in common? During the introduction, students generate observations and questions about the phenomena and create an initial explanation of how they are related. Students will gather clues during and after each lesson in this unit to help them improve their explanation. It is important to encourage students to recognize that even if they don't know the perfect answer yet, they are going to learn a lot throughout the unit and will have an opportunity to change or add to their first explanation.	States of Matter See-Think-Wonder Chart	
States of Matter Lesson 1		2-ESS2-3	22	In this lesson, students observe		

Where do animals find the water they need?			that different bodies of water can be found around the Earth, and that water can be liquid or solid.		
	23		In the hands-on activity, Arctic Adventure, students explore the Arctic and gather observations of how Arctic animals interact with water in many different ways. Wrap-up slides & teacher-led discussion.	<u>Water Journal</u>	
	24		Anchor Connection Students wonder: What other substances can change between liquid and solid? Students learn: Many substances can exist in either a liquid or a solid state, but water is one of the only substances that students can regularly observe in both of those states.	<u>Science Journal</u> entry to answer anchor connection question.	

			25	<u>Lesson 1 Assessment</u>		
States of Matter Lesson 2 How is an ice cube like a crayon?		2-PS1-4	26	In this session, students explore the incredible ability of water to reverse back and forth between solid and liquid states, depending on temperature.		
			27	In the hands-on activity, Ultimate Undo Showdown, students make observations of other materials and their properties after being heated up and then cooled down. They use these observations as evidence that some changes are reversible and some are not. Wrap-up slides & teacher-led discussion.		
			28	Anchor Connection Students wonder: When plastic melts is it reversible or irreversible? Students learn: Water is an example of a		

				substance that can change back and forth repeatedly between the liquid and solid states. In other words, these changes are reversible. Other substances, however, might only be able to change state a single time, and then be unable to reverse to the previous state. Changes of this nature are called irreversible.			
			29	<u>Lesson 2</u> <u>Assessment</u>			
States of Matter Lesson 3 Why are so many toys made out of plastic?	Heating, Cooling, & Phases of Matter	2-PS1-2 2-PS1-4	30	In this session, students learn about melting, about the solid and liquid states of matter, and then discover why plastic was invented.			
			31	In the hands-on activity, Candy Melt, students conduct an investigation to determine which types of candy melt in hot water. Using their observations, they decide which			

				candy is the best choice to bring to a hot summer camp. Wrap-up slides & teacher-led discussion.			
			32	Anchor Connection Students wonder: How do the people working in foundries see what they are doing while their face is covered? Students learn: Many plastics are materials that can melt, and then resolidify into new shapes. This is very helpful for making many types of toys. There are also many types of foods that can melt and solidify, which is helpful in making candies in a variety of fun shapes.		<u>Science Journal</u> entry to answer anchor connection question.	
			33	<u>Lesson 3 Assessment</u>			
States of Matter Unit Assessment			34	<u>States of Matter Unit Assessment</u>			
States of Matter Performance Task			35	In this performance task, students	2-PS1-4		

How can we make bubbles crack instead of pop?					investigate what happens to bubbles that change from the liquid to solid state. After a brief review of the unit, students make observations of bubbles and explain how to cause reversible changes to them.		
Unit 2 Common Assessment			36		LPS Unit 2 Common Assessment		