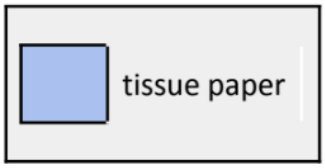
WEEK 3 Lesson 1

Science and Engineering: Matter and Its Interactions

Exploring properties of materials: Solid Materials

Big Ideas	Materials have observable properties. The properties of materials impact how they are used for specific purposes.
Guiding Questions	What are solid objects made of?
Content Objectives	I can identify properties of materials. (2-PS1-1) I can describe and compare the properties of solid objects. (Practice 5, 2-PS1-1)
Language Objective	I can talk with a partner about the properties of materials. (SL.2.2.b)
Vocabulary	**gas:** an airlike substance **liquid**: a substance that flows **material**: what a thing is made of, such as wood, paper, metal, plastic, cloth, or cardboard **matter**: everything on Earth that takes up space, or material **solid**: something that is firm and has a stable shape
Materials and Preparation	● Materials and Properties chart, from Week 2 ● 1-gallon ziplock plastic bags, one for each pair of children (reused from Week 2) ● the following materials measured at 6”x1” pieces, enough for each pair of children to have one, plus one more: ○ metal, such as a short ruler, or similar material ○ stiff plastic, such as a short ruler, or similar material ○ wood or similar material ○ Cardboard ○ aluminum foil ○ flexible plastic, such as from a shower curtain ○ tissue paper In each bag, prepare an identical kit of materials. ● index cards, about 7 ● glue stick

	With the extra materials, prepare word cards: attach a sample of each material to a separate card and write the name of the material.  Bring one bag of materials to the whole group for demonstration.
Warm Up 10 minutes	*Last week we started exploring materials and their properties. Today and tomorrow we will learn more about the properties of some materials.* *The materials you had available to build the chair are made of what scientists call matter. Matter is everything on Earth that takes up space. Our bodies, the tables, the rug, the water in the [fish tank or sink], the air we exhale... all of these are matter. Scientists divide matter into three different groups, or categories: solid (like the rug), liquid (like water), and gas (the air we exhale).* Ask children to put their hands in front of their mouths to feel the air as they breathe out. *All of the kinds of matter, or materials, that you used last week to build your chairs are solids. Today and tomorrow we will learn more about solid materials and their properties.* Refer to the Materials and Properties chart. Identify the materials as solid matter. Model the investigation with a bag of materials and with one child acting as a partner. *With your partner, take one material out of the bag, name it, and then take turns describing it, or naming its properties.* For example: Teacher: *This is a piece of metal. This metal is shiny.* Child: *This metal is smooth.* Teacher: *This metal is flexible.* *When you run out of ideas for one material, pull another material out of the bag, and start again.* Distribute one bag of materials to each pair of children. Send them to work in pairs throughout the classroom.
Instruction/ Practice 30 minutes	Bring the group back together. *Now that you have thought about the properties of each material, let's play a guessing game.*

	Spread out all the materials from one bag so that everyone can see them. Silently identify one material. *I'm thinking of a material whose properties are _____ and _____. Talk with your partner: Which one am I thinking of? When you agree about which material I'm describing, choose that same material from your own bag and hold it up. Remember, two properties of the material I'm thinking of are _____ and _____.* Respond to children's guesses, naming properties of the materials they show. *I see a material that is _____ but it isn't _____.* Allow children time to make comparisons and talk about why they chose certain materials. As materials are identified, add the corresponding cards to the Science and Engineering Word Wall. These will serve as a reference throughout the unit. Continue playing until all of the materials have been identified. Model and then play a new game. *Let's play one more game, called Find it! I will say the name of a solid material, such as wood or plastic. You and your partner will walk around the classroom to find something made of that material. When you find something, have a conversation: Why might an engineer have decided to use that material to build that object?* For example: Wood. Walk around the classroom to identify a piece of wooden furniture, and think aloud: *Engineers might have chosen to build this shelf with wood because wood is strong. It won't break if we put lots of heavy books on it.* Name each material, allowing children time to move in pairs around the classroom to identify objects made of each material and articulate why the material might have been chosen for a given purpose. Note that more than one material may be appropriate for a single function (both metal and wood might be used for sturdy shelves, for example), but that aesthetic decisions are also part of the design process (wood may look nicer).
Synthesis/ Cool Down 10 minutes	*You are already making some important discoveries about materials and their properties. You'll have more time to use these materials in the Discovery Studio.*
Standards (Boston Science Standard)	**SL.2.2.b** Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue. **2-PS1-1** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties

Assessment	Observe and listen in as children work together, noting their vocabulary, how they handle materials, and what kinds of knowledge they bring to the experience. Make note of children's discoveries and misconceptions. Pay attention to how children interact with their partners.

Notes