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| **Grade 5** | **Lesson:** **Matter Part 1** | Reference to English Interconnections LessonWhat is Matter? Solid, Liquid and Gas pg. 153 |
| **Science Standard(s): Standard IObjective 2** |
| **Content Objective(s):** | **Language Objective(s):** |
| Students will be able to classify objects as solids, liquids, gasses or a combination of two types of matter by observing the characteristics of objects with a small group and in partnerships.***I can classify objects as solids, liquids, gasses or a combination of two types of matter by observing objects with a group of friends and with a partner.***我可以通过和同学一们一起观察来区分出物体的状态是固体，液体，气体还是两种混合体。  | Students will be able to defend a classification of an object as a solid, liquid or gas by discussing characteristics of matter in small groups and in partnerships.***I can explain why I classified an object as a solid, liquid or gas by talking about its characteristics with a group of friends and with a partner*.**通过在学习小组里和同学们谈论物体状态的特性，我可以解释为什么我定义某个物体是固体，液体和气体。 |
| **Essential Questions:***What are characteristics of matter? How do physical and chemical changes affect matter?**物质的特性是什么？物理和化学变化怎么影响物质？* | **Required Academic Vocabulary for Word Wall:****Listen:**matter, solid, liquid, gas, combination, classify, atoms物质，固体，液体，气体，混合物，原子**Speak:** matter, solid, liquid, gas, combination, atoms, rigid, volume, fit, invisible, expand物质，固体，液体，气体，混合物，原子，坚硬，体积，充满，看不见的**Read:** **Write:** solid, liquid, gas, atoms, rigid, volume, fit, invisible, expand物质，固体，液体，气体，混合物，原子，紧密，体积，充满，看不见的，扩张。**Sentence Frames:**I think \_\_\_\_\_\_\_ (object) is a \_\_\_\_\_\_\_ (solid, liquid, gas) because \_\_\_\_\_\_\_\_\_\_\_\_\_\_.我认为————（物体）是————（固体，液体，气体）因为I don’t think \_\_\_\_\_\_\_ (object) is a \_\_\_\_\_\_\_ (solid, liquid, gas) because \_\_\_\_\_\_\_\_\_\_\_\_\_\_.我认为————（物体）不是————（固体，液体，气体）因为 |
| **Materials:*** Recording Sheet 1 for Table Activity- 1 for each group of students
* Containers of air for the table
* Containers of water and liquids for the table
* Solid objects for the table
* Vocabulary Cards
* 3 posters or large sheets of chart paper
* Recording Sheet 2 for Guided Practice- 1 for each group of students
* Balloons filled with air or helium- 1 for every group of students
* Cans of Soda- 1 for every group of students
* Bottles of Shampoo- 1 for every group of students
* Tubes of toothpaste- 1 for every group of students
* Containers of Applesauce- 1 for every group of students
* Package of Pop Rocks- 1 for every group of students
* Jar of Stage 2 Baby Food- 1 for every group of students
* Construction paper for foldables- 1 for every student
* Scissors for foldables
* A ziplock bag of ¾ cup of corn starch for each partnership
* A couple of ½ cup measuring cups for the class to share
 | **Additional Lesson Vocabulary:**Space, building blocks, hard, resistant, wet, size, close, change, apart, balloon, air, soda, shampoo, toothpaste, applesauce, candy, baby food空间，最小（基础）单位,硬，阻碍，拾，大小，关闭，变化，分隔，气球，空气，苏打，香波，牙膏，苹果酱，糖果，婴儿食物 |
| **Lesson:** | **Instructional Time:45 Minutes** |
| **Opening:(10minutes)**Hook: Set up a table of solid objects, a table with various containers filled part way with water and different liquids, and a table with empty containers (filled with air). Leave a note on the table or mention to students that the empty containers are for looking at what is inside the containers, not the containers themselves. Assign students partners or groups of 3-4 to walk around the different tables. Give each partnership or group a recording sheet.Explain: “Each group will have a recording sheet. You will have 5 minutes to walk around the different tables with your partners/group members. You should think of the question, ‘What do these items have in common?’ You can sketch and write notes in the different squares of your record sheets. Be sure to stay in the target language and see if you can figure out the “rule” that explains why all of these items have been grouped together. Be careful not to share your ideas with other groups. You will rotate on your own and we will discuss your findings in five minutes.”Question: “What do all of these things have in common? What is the rule for each table? You may begin!”每个小组都会有一张记录表。你和小组成员有五分钟去不同的小组参观。在参观的时候你们需要想一个问题“这些东西都有什么共同点？” 你们可以在纸上不同的小框里打草稿和做笔记。要动脑筋找到一条规则来将这些东西分到一起。但是记住你们要一直用中文，并且用中文来解释给你的组员听。 不要把答案告诉别的小组。你们可以轮流到不同的桌子观察。我们会在在五分钟后讨论你们的发现。问题：“这些东西都有什么共同的特点？每一个桌子上的东西都代表了什么规则？你们可以开始了”* Monitor the students and ensure they are staying in the target language, talking quietly so they don’t share their ideas with other groups and that they understand what they are to do.
* After 5 minutes have each group share their “rules” for each set of objects. If you need to, guide the discussion so that each table represents a phase of matter—solid, liquid or gas.

Explain: “Great observations, ideas and guesses. Let’s look at our learning objective for the day.”“你们的观察很仔细，想法和猜想也很好！你们真厉害！下面我们来看看今天我们的学习目标。”Introduce the Objectives: Have the students read the content as a class. Have Partner 1 tell Partner 2 one thing the class will learn today. Have Partner 2 tell Partner one how we will know that we learned it.**Introduction to New Material (Direct Instruction): (7 minutes)**Explain: “There are three basic phases of matter—solid, liquid and gas.” Post vocabulary cards. “Matter is anything that takes up space and is made of atoms. Atoms are the building blocks of matter. A solid is hard and rigid, is resistant to change in size and volume and its atoms are close together. A liquid is often wet, changes its size to fit its container, and its atoms are not incredibly close together. A gas is often invisible, its volume expands to fill an entire container and its atoms are farther apart.”.物质有最基本的三种状态---固体，液体和气体。“物质是任何占据了空间，并且由原子组成的东西。原子是组成物质的最小单位。固体是坚硬的。它难以被改变大小和体积。组成固体的原子非常的紧密。 液体是湿的，它的形状随着盛放它的容器而变化。组成液体的原子并不是非常紧密。气体常常是看不见的。他的体积会扩张并且占据整个空间。气体的原子之间的距离很远。* Hang three posters on the board or on the wall. Label them “Solid”, “Liquid” and “Gas”.

Question:“What do you know about solids? Think of the definition we just learned and what you already know. Discuss with your partners.”有关固体，大家都知道什么？回想一下刚刚我们学到的概念和你原来知道的知识。和你的学习同伴一起讨论一下* Have students share with the class what they discussed with their partners. Write their important points on the poster.

Question:“What are some examples of solids? Discuss with your partners.” 和你的同伴商量一下，有什么例子是固体？* Have students share with the class what they discussed with their partners. Write their important examples on the poster.
* Repeat the same process for liquids and gasses.

**Guided Practice: (15minutes)**Explain:“Sometimes it is easy to classify an object as a solid, liquid or gas. Other times, it is a little more difficult. Sometimes, matter can fit in more than one category. We have the vocabulary cards with definitions to help us; we have these posters with things we know and examples. We are going to look at some different objects in small groups and decide if the objects are solids liquids or gasses, or maybe they fit under more than one category. You will have to defend the categories you placed each item in and explain why it fits each category. You are welcome to touch each item, apply pressure to each item, smell and even taste the items. Do not eat them; this isn’t lunch, but you can taste them if it is a food item and it will help you classify them. You can use the sentence frames to help you, if needed, but it will be more comfortable for you to use natural language.”Post the sentence frames.有时，区分一个物体固体，液体或气体非常容易。但有的时候却有点困难。有的物质可以存在于不止一种状态里。我们可以用写有定义的词汇卡片。我们也可以用带着例子的张贴画。 接下来，我们要在小组里看看不同的物体，然后来决定他们是固体，液体，气体，或多于一种状态。你们也同时需要解释为什么把这个物体归于这个状态。你们可以触摸，挤压，闻或品尝这些物体。他们不是午饭，别吃它们。如果这物品是食物并且品尝能帮助你们来区分他是物体，液体或是气体。如果需要的话，你们可以尝一下。如果需要，你们可以用句型模板，但用自己的语言更好。*Use the modeling cycle:**Teacher Does:** Use a puppet, stuffed animal or an imaginary group members to model. Hold up a can of female shaving gel. Squirt some out onto your hand. Ask your group what you think it could be. Look at and point to the description of a solid. Ask your group members if they think it is rigid and has a solid form. The imaginary group members could touch it and see that it does not maintain its shape. One of them can say, “I don’t think it is a solid because it does not maintain its shape when I place pressure on it.”

我不认为这个东西是固体，因为当我压它时，他变形了。*Teacher Does with a Group of Students:** Call up a group of 3 students to help you model. As the teacher, you will be the fourth group member. Ask the group members what they think it could be. Look at and point to the description of a liquid. Ask your group members if they think it could be a liquid. Your student group members should mention something like, “Well it is wet like a liquid. When we rub it, it feels like a liquid. It might fill a container like a liquid, but maybe not at first and not on its own. When you combine it with water, it acts more like a liquid.” 这个东西像液体一样湿湿的。当我揉搓它时，感觉就像液体。 就像别的液体一样，它也许能注入这个容器，但是刚开始它可能不能自己流。 Ask the group if they think it could be a liquid. Many of them should agree. Use the recording sheet to write, “shaving gel” under “liquid”. Ask the students to help you write the reasoning why it could be a liquid.

*A Group of Students Do:** Call up a group of 4 students to model. Tell the group, “It is possible that this shaving gel is not only a liquid. It may be another type of matter as well. Continue the conversation the past group had to see if it fits another category.” The group should look at the gas category. By this time, the shaving gel that you have touched and spread as a teacher should be bubbly, foamy, and more like a gas. The group should discuss together and should make comments like, “It is bubbling and becoming invisible. It is dissolving and looks like it could be becoming a gas.” 它在冒气泡并且变得看不见了。它正在溶解，看起来像变成了气体。 A group member should use the recording sheet to write “shaving gel” under “gas”. The group members should help the student write the reasoning why it could a gas.

*All Students Practice:** Hold up one item and pass out that item to the different groups. There should be one item for each group of students. Pass out one recording sheet for each group of students. Ask the students if this item is a solid, liquid or gas and why. Walk around and ensure students are staying in the target language. Ensure all students are participating and talking. After students have discussed the item, they should record it on their record sheet. When all students are finished, discuss the item as a class and how the different groups classified it. Hold up the next item and pass it out to the different groups. Continue this procedure for all of the items:

Balloon full of air/heliumSodaBubblesShampooToothpasteApplesaucePop RocksBaby food**Independent Practice: (10 minutes)*** Pass out a sheet of construction paper to each student. Have them fold the sheet of paper in half landscape-wise or hot dog style. Next, have them fold the paper in thirds. Unfold the thirds so that the paper is just folded in half with some fold lines dividing the half into thirds. Students will cut on the thirds fold lines to make a foldable. See example:

Whole sheet fold in half landscape fold in thirds unfold to reveal the thirds cut on the thirds lines* Have students label with you the front flaps: Solid, Liquid, Gas. See example:

GasLiquidSolid* Hide the posters and vocab cards with the definitions and examples of solids, liquids and gasses. Have students open the flaps with you. On the top part of the flaps, tell students they will define Solid, Liquid and Gas in their own words working with a partner. They should use as many words as they can to describe them. At the end of their definition, they can give a couple of examples. They must each write on their own papers, and they don’t need to write the exact same thing as their partners. They can use their partners to talk about their responses and come up with ideas, and then they can write on their own. They should not write in the bottom flap at all. See example:

GasLiquidStudents write in the upper flaps, not on the lower flaps.* Pass out a ziplock of ¾ cups of Corn Starch to each partnership. Pass out plastic cups, containers or pie tins to each partnership. Have students take turns getting ½ cup of water. Tell students they are going to make some “Goop” or “Oobleck”. Have all partnerships mix the ingredients together in the plastic cup, container or pie tin with a spoon or their fingers. On the bottom flap of their foldable they will write observations of the mixture and classify it. If they think it has characteristics of a solid, they will write down evidence of why they think it is a solid on the lower flap under solid. If they don’t think it has any characteristics of a solid, they won’t write anything on the lower flap. If they think it has characteristics of two types of matter, they can write on two different flaps. They must discuss in partnerships and write on their own papers. Make sure they keep their discussions quiet so that other partnerships won’t hear their discussions. Have students write their names on their foldables and collect them for assessment.
* **Closing: (3 minutes)**

Revisit the Objectives: Have students reread the content objective as a class. Have students explain to their partners one new skill they learned today, and how they know they learned it. Have some students share with the class.Real World Application: Tell students to observe different items and products they have at home and determine whether they have characteristics of a solid, liquid, or gas or more than one type of matter. Have them share their observations during another class period. |
| **Assessment:** |
| Observe students conversations during guided and independent practice to assess their mastery of the language objective. Observe students’ classifications during guided practice and collect their foldables to assess their knowledge of the content objective in the independent practice.  |
| **Extra Ideas:** |
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记录表 1

姓名 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 日期\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

在每个空格里，写下你们的观察结果:

|  |  |  |
| --- | --- | --- |
| 一号桌 | 二号桌 | 三号桌 |

在一号桌上的东西有什么相似点（很像的地方）？

在二号桌上的东西有什么相似点（很像的地方）？

在三号桌上的东西有什么相似点（很像的地方）？

记录表 2

姓名 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 日期\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| --- |
| 固体 |

|  |
| --- |
| 液体 |

|  |
| --- |
| 气体 |

**MATTER** anything that takes up space and is made of atoms; 3 phases of matter: solid, liquid and gas

物质是任何占据了空间，并且由原子组成的东西。物质有三个状态，固体，液体和气体。



**ATOMS** the building blocks of matter

原子是组成物质的最小单位

**SOLID** matter that is hard and rigid, resistant to change in size and volume, and its atoms are close together

固体是坚硬的。它难以被改变大小和体积。组成固体的原子在一起非常的紧密。





**LIQUID** matter that is often wet, changes its size to fit its container and its atoms are not incredibly close together

液体是湿的，它的形状随着盛放它的容器而变化。组成液体的原子并不是非常紧密。

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**GAS** matter that is typically invisible, its volume expands to fill an entire container, and its atoms are farther apart

气体常常是看不见的。他的体积会扩张并且占据整个空间。气体的原子之间的距离很远。

