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| **Lesson Content** | | | |
| **What Standards (national or state) relate to this lesson?**  (You should include ALL applicable standards. Rarely do teachers use just one: they’d never get through them all.) | SC.5.P.8.1- Compare and contrast the basic properties of solids, liquids, and gases such as mass, volume, color, texture, and temperature.  SC.5.N.2.2- Recognize and explain that when scientific investigations are carried out, the evidence produced by those investigations should be replicable by others | | |
| **Essential Understanding**  (What is the big idea or essential question that you want students to come away with? In other words, what, aside from the standard and our objective, will students understand when they finish this lesson?) | Students should understand how the physical properties of an object can be determined.  EQ: How can the physical properties of an object be determined?  Additional Questions to be Answered: What are properties of matter? How can we use properties to sort matter? | | |
| **Objectives- What are you teaching?**  (Student-centered: What will students know and be able to do after this lesson? Include the ABCD’s of objectives: action, behavior, condition, and degree of mastery, i.e., "C: Given a sentence written in the past or present tense, A: the student B: will be able to re-write the sentence in future tense D: with no errors in tense or tense contradiction (i.e., I will see her yesterday.)."  Note: Degree of mastery does **not** need to be a percentage.) | Given several different objects and substances, the students will be able to observe and document physical properties of the objects and use these observations to classify them in the correct state of matter category.  Content: Properties of Matter  Nature of Science: Science demands evidence  Process Skill(s): Observing, Sorting | | |
| **Rationale**  Address the following questions:   * Why are you teaching this objective? * Where does this lesson fit within a larger plan? * Why are you teaching it this way? * Why is it important for students to learn this concept? | We are teaching this lesson so that students will be able to classify into the appropriate state based on observable physical properties. This lesson is necessary for our next lesson which will include refining the students’ definitions of the 3 states of matter, and demonstrating how the solids, liquids, and gases behave under different circumstances. We are teaching this as a guided inquiry so that students can explore the properties of different types of matter and come to their own conclusions of how the different objects should be classified. It is important for students to use properties to classify and identify states of matter in order to more closely examine properties of matter, mixtures, and changes in states of matter. | | |
| **Evaluation Plan- How will you know students have mastered your objectives?**  Address the following:   * What formative evidence will you use to document student learning during this lesson? * What summative evidence will you collect, either during this lesson or in upcoming lessons? | Summative: Students will answer the EQ in their notebook and provide evidence for their claims from the observations they took during the exploration/investigation.  Formative: I will use anecdotal notes to record what students are documenting in their science notebooks during the exploration. We will also assess knowledge during the discussions to make sure students are on target with their thinking relating to the topic. | | |
| **What Content Knowledge is necessary for a teacher to teach this material?** | The teacher must have adequate knowledge of what matter is, what properties are, how matter is classified into different states, as well as knowledge of possible student misconceptions regarding the prior mentioned content. I used the Nat Geo Teachers edition, as well as an article from Science and Children titled [What’s the Matter with Teaching Students About Matter](file:///C:\Users\Stacy\SkyDrive\Fall%202014%20Docs\SCE%20Resources\MatterWithTeachingMatter.pdf). | | |
| **What background knowledge is necessary for a student to successfully meet these objectives?**   * How will you ensure students’ have this previous knowledge? * Who are your learners? * What do you know about them? * What do you know about their readiness for this content? | Students must have a basic knowledge of what matter is, which was briefly discussed in the previous unit. They must know the difference between and observation and an opinion, which was covered during the first 2 weeks of school in our lessons on process skills. | | |
| **What misconceptions might students have about this content?** | 1. Students may think that solids cannot be broken, or that their state will change when broken. 2. Students may think that gases do not have mass, since they cannot feel the weight of the air. | | |
| **Lesson Implementation** | | | |
| **Teaching Methods**  (What teaching method(s) will you use during this lesson? Examples include guided release, 5 Es, direct instruction, lecture, demonstration, partner word, etc.) | I will be using the 5 E’s for implementation in this lesson. Specifically Engage, Explore, Explain. | | |
| **Step-by-Step Plan**  (What exactly do you plan to do in teaching this lesson? Be thorough. Act as if you needed a substitute to carry out the lesson for you.)  Where applicable, be sure to address the following:   * What Higher Order Thinking (H.O.T.) questions will you ask? * How will materials be distributed? * Who will work together in groups and how will you determine the grouping? * How will students transition between activities? * What will you as the teacher do? * What will the students do? * What student data will be collected during each phase? * What are other adults in the room doing? How are they supporting students’ learning? * What model of co-teaching are you using? | Time | Who is responsible (Teacher or Students)? | Each content area may require a different step-by-step format. Use whichever plan is appropriate for the content taught in this lesson. For example, in science, you would detail the 5 Es here (Engage/Encountering the Idea; Exploring the Idea; Explanation/Organizing the Idea; Extend/Applying the Idea; Evaluation).  Engage- (3 minutes) I start by giving the students 1 minute to just play with the materials and try to figure out what they are. This allows them to just dig in and get the playing out of their system so that they can focus when they are asked to complete certain tasks with the materials. Then I will ask the students why they thought I might have just let them dig in with no instructions or purpose. I hope to eventually receive the answer, “to figure out what these substances/objects are.” Then I will tell the students that when scientists need to learn something new about an object or type of “matter”, they make observations. I will then tell the students “As scientists, I would like you to make observations on these different objects/substances so that we can figure out what they are and learn about their properties.”  Explore- (15 minutes) I will tell the students that they will have 5 minutes to make as many observations as possible in their science notebook, about each of the items on their table. They are encouraged to do this in collaboration with their other table members. The lead teacher and co-teacher will circulate and asked students what properties they’re observing. We will address at this time opinions vs. observations if students have trouble distinguishing between the two. Transition back for discussion, “bring it back in 5,4,3,2,1”.  Explain-(5 minutes) Whole group discussion: Have students share out some of their observations. Have students infer what the object or substance is and give evidence. Finally tell students what each of the objects/substances are before moving onto the next phase of the exploration.  Explore-(15 minutes) Tell students to now sort these items based on any properties that they observe. Possible categories: Shape, size, state, temp., texture, mass/volume, color. Lead teacher and co-teacher will circulate to address and categorizing issues, misconceptions, behavior issues, etc. During this time we will also document how groups are categorizing so that we can call on them in an order that will benefit our group discussion. Transition back to discussion, “we will bring it back in 5,4,3,2,1”.  Explain-(5 minutes) Whole group discussion: Have students share out the different ways they categorized their pieces of matter. As they list the different properties of matter, write them down on a chart paper. Ask HOT Q’s: Which substances were easiest/hardest to put into categories? Why? If students mention sorting items by their state, solid, liquid, or gas, ask them how they knew to put it in that category. What led you to believe this was a solid/liquid/gas?  (10 minutes) Whole group: As a class, create a wordle for the words SOLID, LQUID, GAS. This wordle will be used in the next lesson to help students write a definition for each of the states of matter. During this time, address any misconceptions such as “solids cannot be broken”, or “gases have no mass”.  Explain-(10 minutes) Independent: Have students respond to EQ in their notebooks and use evidence collected during explorations to defend answer. |
| **What will you do if…** | **…a student struggles with the content?**  We will refer back to the textbook for further examples and if materials are available, provide concrete models of these examples for the students to observe in class. | | |
| **What will you do if…** | **…a student masters the content quickly?**  This EQ covers multiple days. Each of the properties are broken up into separate lessons. Because we will be discussing other properties in the future, I would encourage a student who masters the concept very quickly to first, explain their sorting/classifying to a neighbor, and then try to sort their items into groups using other properties such as color, texture, temperature, etc. | | |
| **Meeting your students’ needs as people and as learners** | **If applicable, how does this lesson connect to the interests and cultural backgrounds of your students?**  Students encounter many different states of matter in their everyday life. They should have, from life experience, some prior knowledge regarding states of matter and how they behave under certain circumstances. | | |
| **If applicable, how does this lesson connect to/reflect the local community?** | | |
| **How will you differentiate instruction for students who need additional challenge during this lesson (enrichment)?**  These students will be encouraged to sort their items into as many different types of categories as possible based on the observations of the object’s properties. They will also be asked to record all of their different grouping rationales and explain them to their peers at their table or in whole group discussion. | | |
| **How will you differentiate instruction for students who need additional language support?**  Allow them to use the textbook to reference pages on properties of matter. Also allow them to research using the classroom tablets. We will also find time to refer to examples in the textbook, and if materials are available, we will use them as concrete examples for the students to explore in the classroom. | | |
| **Accommodations (If needed)**  (What students need specific accommodation? List individual students (initials), and then explain the accommodation(s) you will implement for these unique learners.) | Students 1,2,3,4 and 5 who have diagnosed SLDs will be grouped together so that they can receive support from our ESE specialist. They will also be provided will a table to document their observations, and a graphic organizer to take notes on the different properties.  Student 6, who is a Spanish speaking monolingual will be grouped with another native Spanish speaker and will be provided a translated graphic organizer and translated list of key terms such as properties, matter, mass, volume, color, texture, temperature. | | |
| **Materials**  (What materials will you use? Why did you choose these materials? Include any resources you used. This can also include people!) | 2 Balloons (one filled with air), 6 cups of sugar, 6 cups of flour, 6 rocks, 6 cups of shampoo,6 cups of water, 18 snap cubes, 6 Ziploc bag (filled with air) , 6 balance scales.  I chose these materials because they are easy to access, have may observable properties, are not harmful to be touched, and were small enough to place on the workspace. Also, most of these items were listed in an article/lesson I read to prepare for this lesson titled [What’s the Matter with Teaching Children About Matter](file:///C:\Users\Stacy\SkyDrive\Fall%202014%20Docs\SCE%20Resources\MatterWithTeachingMatter.pdf) from Science and Children. | | |