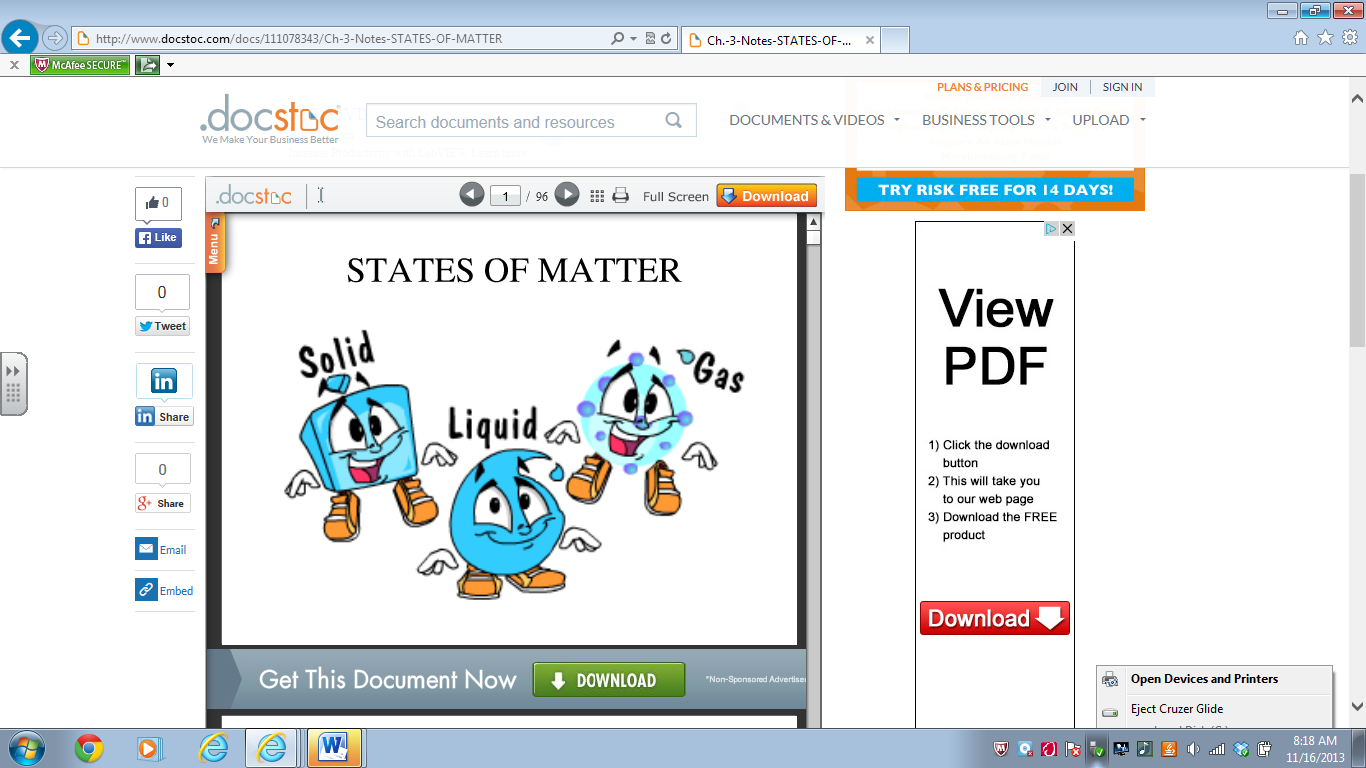
**ECE Science Unit Cover Page**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Student Name:** | Breanna Wisnor | | | | | |
| **Unit Title:** | Science Matters! : Solids, Liquids and Gases | | | | | |
| **Grade:** | Grade 3 | | | | | |
| **School/ District:** | Bowling Green | | | | | |
| **CMT’s Name:** | Jonelle Semancik | | | | | |
| **Calendar:** | **Topic** | **Engage** | **Explore** | **Explain** | **Extend** | **Evaluate** |
| **Day 1** | Identify states of matter and recognize that they can change. |  |  |  |  |  |
| **Day 2** | Observe the interaction of solids, liquids and gases. Defend their position on if oobleck is a solid or a liquid. |  |  |  |  |  |
| **Day 3** | Understand that states of matter are determined by the amount of kinetic energy the atoms possess. State what the molecules in a solid, liquid or gas look like. |  |  |  |  |  |
| **Day 4** | By making root beer floats, students will examine how each state interacts with each other and label each ingredient as a solid, liquid or gas. |  |  |  |  |  |
| **Day 5** | Review and post-assessment. |  |  |  |  |  |



**Context for Learning**

*Provide the following information about the students to whom you will teach your unit. If you will be teaching the unit to more than one class of students, please limit your description to the class on which you plan to focus your TPA commentary.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Grade Level:* | 3rd | *Age Range:* | 8-9 years | *Number of Students in Class:* | 20 |
| *Number of Boys:* | 11 | *Number of Girls:* | 9 | *Number of English Language Learners:* | 3 |
| *Number of Students Identified as Gifted and Talented:* | 1 | *Number of Students with IEPs or 504 plans:* | 2 | *Percentage of Children Eligible for Free/Reduced Lunch:* | Unable to obtain this information |

|  |  |  |
| --- | --- | --- |
| *Complete the chart below to summarize required accommodations or modifications for children receiving special education services and/or those who are identified as gifted and talented as they will affect your instruction and assessment during this unit.* | | |
| *Special Needs* | *Number of Children* | *Accommodations, Modifications and/or Pertinent IEP Goals* |
| Gifted and Talented | 1 | Attends PACE for the entire school day every Friday. |
| Emotionally Disturbed | 1 | *Extended time, breaks, personal paraprofessional, visual and verbal prompts, behavior and visual schedule, behavioral system.* |
| Epilepsy | 1 | Preferential seating close to the teacher, extended time, small group access, reader and cueing during assessment. |
| ELL | 3 | One on one tutoring; necessary assessment accommodations as needed; reader. |
| Struggling Readers | 4 | 4 students receive instruction with the Title teacher.  3 of these students also have a Project More tutor. |

**Learning Environment**

*Identify elements in the environment that create and structure learning opportunities during this unit, such as seating/table arrangements, locations for learning centers, classroom technology, literature references/enrichments, and teaching materials.*

Each student has his/her own desk. Each desk faces another student’s desk. Desks are grouped in three pods. The first pod includes 2 rows of 4 desks. There are 2 rows of 2 desks in the second pod. The third pod contains 2 rows of 4 desks. In this classroom, the teacher’s desk is a kidney table in the back of the room. This table is often used for small group instruction. There is also a “community spot” (an area for students to sit on the floor) with chart paper and a dry erase board for more intimate, whole group instruction.

The technology in this classroom includes a SmartBoard and 20 chrome books. The SmartBoard will be utilized during this unit. The chrome books will not be used because they require a great deal of log in time.

Below is a list of books that will be in the non-fiction book display during this unit.

“Change It! Solids, liquids, gases and you!” by: Adrienne Mason (this book will be read on Day 1)

“Amazing Materials” by: Sally Hewitt (parts of this book will be read on Day 3)

“The Scoop About Measuring Matter” by: Tracy Nelson Maurer

“Materials: Liquids, solids, and gases-their properties and uses” by: Clive Gifford

“The Stunning Science of Everything: Science with the squishy bits left in!” by: Nick Arnold and Tony De Saulles (pages on matter, liquids and gases are marked with tabs for students)

This unit will also be supplemented with other materials such as videos, a rap and experiments. Students will also be defining terms and recording observations and hypotheses in their science journals. Their science journals are utilized each week and contain information learned throughout the entire school year. Handouts and materials for science journals for the day will follow each day’s lesson plan. On the final day of the lesson, the students will play a game from the CRC called Can Do! Science Game: Matter. This game includes a spinner with sections labeled solid, liquid, gas and 60 question cards on each subject. There are also 40 tokens to keep track of score.

**ECE Science Daily Lesson Plan**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Teacher Candidate’s Name: | | Breanna Wisnor | Date: | Monday 11/25/13 and Tuesday 11/26/13 |
| Grade Level: 3 | Lesson Title/Topic:What is a Solid, Liquid and Gas? | | | Day:1 |

1. **Lesson Rationale:** *A rationale briefly explains in paragraph form:*

* *why this lesson is important or relevant*
* *why you have chosen to teach it in this particular way*

This lesson is important and relevant because it addresses the required third grade common core state standards for physical science: matter. After pre-assessing my students, I realized that they were able to identify solids, liquids and gases but did not know that everything is made up of matter or what the molecules in solids, liquids and gases look like. In order to explain these concepts, I will be defining the terms solid, liquid and gas. Students know how to classify these based on physical characteristics; by providing them with factual definitions, however, they will be able to explain why objects are solids, liquids or gases based on their properties. This will help them better understand that everything is made up of matter and what the molecules in each object look like. Instead of directly telling the students, I will read them a book and will allow them to explore on their own so that I can explain the definitions to them in a meaningful way. Students will then record their notes in their science journals to reinforce the learning. At the end of the lesson, students will listen to a rap on the states of matter. They will be given the lyrics to sing along the second time it is played. This lesson is multimodal because it incorporates listening, seeing, touching, singing, reading and writing. By teaching the lesson in this way, I will reach various types of learners.

1. **Content Focus: Essential Question or Enduring Understanding:** *This is a question or statement that directly targets the learning/inquiry in which your students will participate. It focuses on your planning, instruction and assessment.*

What is a solid, a liquid and a gas?

1. **2002 Standard, Benchmark and Indicator(s) *OR* 2010 Strand, Topic and Content Statement(s):**

|  |
| --- |
| ***Write the 2002 (old) standards****. Include standards, benchmarks and indicators addressed by this lesson (include the content, science and technology scientific inquiry and scientific ways of knowing standards).*  Click here to enter the 2002 standards, benchmarks, and indicators. |
| ***Write the 2010 (revised) standards****. Include the strand (e.g., Earth & Space, Physical, Life), Topic (e.g., for 3rd grade: Earth’s Resources); and portions of the content elaboration statements that are addressed by this lesson (e.g., for 3rd grade: Soil is composed of pieces of rock, organic material, water and air and has characteristics that can be measured and observed.).*  **Common Core State Standards**  *Domain:* Physical Science: Matter: Properties and Change  *Cluster:* Understand the structure and properties of matter before and after they undergo a change  *Standard:* 3.P.2.1 *Text of objective:* Recognize that air is a substance that surrounds us, takes up space and has mass.  *Standard:* 3.P.2.2 *Text of objective:* Compare solids, liquids, and gases based on their basic properties. |
| ***Write your lesson’s objectives****. These should be measurable and specific statements indicating what you want students to be able to say or do upon completion of the lesson and the conditions under which students will be assessed. The statement should use active verbs (Bloom’s taxonomy is a good source) and be worded so that the desired learning is observable. (e.g., Given time and materials to collect data, TSSBAT determine the type of mathematical relationship that exists between temperature and pressure using correct terminology; Given velocity word problems, TSSBAT solve the problems by setting up equations and finding the missing variable; Given a short answer question, TSSBAT define temperature as the measure of thermal energy; Given drawing materials, TSSBAT use a drawing to explain how convection currents in the mantle cause crustal plates to move; Given time and materials, TSSBAT evaluate the efficacy of two different fertilizer regimens on the growth of radish plants based on experimental results.)*  *Number of statements will vary, but they should be few & focused enough to accomplish in time allotted. If you have more than one objective, number them here.*   1. After given time and materials to explore and listen to a story on states of matter, the students will be able to match the term solid, liquid and gas with its definition by creating a flip chart in their journals. |

1. **Academic Language:** *In a bulleted list, provide the**specialized content terms/vocabulary that students will need to know* (erosion, democracy, perimeter, onomatopoeia). *Define the specialized vocabulary in terms children in your grade can understand. Also list the general academic language* (compare, contrast, analyze, explain, synthesize,etc.) *that students need to understand in order to complete your academic tasks. Remember, your tasks must be tied to the content focus*.

* Define-give a definition
* Matter-any substance-solid, liquid or gas-that takes up space
* Solid-matter that holds its own shape
* Liquid-matter that flows and takes the shape of the container it is in
* Gas-matter that spreads to fill the space it is in

1. **Academic Demand:** *Explain by each 5E phase how your lesson is designed to help children develop or reinforce their understanding of the required academic language so that they are able to effectively communicate orally and in writing their thinking and knowledge*.

During the engagement, I will tell students that inside each balloon there is a solid, liquid or gas. I will not give them the formal definitions because during the explore phase, the students will use their own words to describe if there is a solid, liquid or gas inside the balloon. During the explanation, I will read the book, “Change It!” As we read about each state of matter, we will open the balloon to discover what is inside and if we were right based on the definition and description in the book. I will extend the learning by having students match definitions and terms to complete a flip chart for their journals. I will use this flip chart to evaluate student learning.

1. **Planned Assessments:** *Indicate the types of assessments you plan to utilize in your lesson, and then indicate within your plan where each will be implemented. (Not all types are needed in each lesson.) Be sure assessments are clearly aligned with lesson objectives.*

|  |  |
| --- | --- |
| *Pre-assessment:* | I will informally pre-assess students by listening to their explanations on what is inside each balloon and how they know whether it is a solid, liquid or gas. |
| *Formative Assessment:* | I will formatively assess throughout the unit by listening to student responses during the read aloud. If students seem to still be confused, I will review the material in more detail before asking them to complete the day’s summative assessment. |
| *Summative Assessment:* | Students will match each term to its definition to complete a flip chart for their science journal. Today they will be matching each definition with its term. |

1. **Differentiated Instructional Strategies:** *In a bulleted list, indicate the accommodations you will provide for individuals and subgroups within your class: accelerated learners, English Language Learners*, *as well as learners with special needs. If you do not have students identified as gifted, please list accommodations you could make for students who seem accelerated in science compared to other students. If you do not have students with IEPs or 504 plans, please list accommodations you could make for students who seem to have difficulties organizing, reading/comprehending, reasoning independently, remembering, etc. (Accommodating does* ***not*** *mean simply requiring students to do more or less; it means helping them access content & produce satisfactory work in ways best suited to their academic needs. This might include teacher modeling, utilizing graphic organizers, translation websites, differentiated reading materials, etc.) Do not leave any section blank.*
2. **Gardner’s Multiple Intelligences**

* Visual/spatial – flip chart
* Bodily kinesthetic – motions with rap
* Musical – states of matter rap
* Interpersonal – whole group instruction at community center
* Intrapersonal – matching definition with term individually
* Linguistic – listening to story and verbally explaining each state of matter
* Logical/mathematical – logically explaining terms and definitions

1. **Accelerated Learners**

* I will ask my accelerated student to come up with his own definition for each term on his flip chart.

1. **English Language Learners**

* I will provide a picture to accompany the definition to help students match terms and definitions.

1. **Students with Special Needs**

* I will read the terms and definitions to my student on a 504. For my ED student with an IEP, I will monitor his behavior and allow him to take breaks whenever needed.

1. **Resources:** *Enter what is needed by each entity for each 5E phase. If a phase is not performed today, state the day it will be or was performed in this learning cycle. If nothing is needed by an entity, type “none” in the cell.*

|  |  |  |  |
| --- | --- | --- | --- |
| 1. **Materials:** | Teacher | Small Groups | Individuals |
| Engagement | Three balloons filled with water, ice and air | none | none |
| Exploration | Three balloons and a sharpie | none | I will pass around the balloons for students to make predictions about what is inside. |
| Explanation | Book: “Change It!”  Three balloons  Pair of scissors  Bowl/tub to catch liquid | none | none |
| Extension | none | none | Pre-made 3 row flip-chart  Scissors  Glue  Science journals  Key terms and definitions |
| Evaluation | Completed flip chart in journal | none | none |
| 1. **Safety Concerns:** | I will be handling the scissors to open each balloon. I must be careful, especially when cutting away the rubber on the ice balloon. | | |
| 1. **Graphic Organizers:** | Students will use a graphic organizer in the extend phase by matching definitions and terms on a flip chart. | | |
| 1. **Cooperative Learning:** | This day’s lesson does not include cooperative learning. | | |
| 1. **Technology Integration:** | Students will be watching a youtube video on the SmartBoard during the conclusion of the lesson. | | |
| 1. **References:** | Mason, A., & DaÌvila, C. (2006). Change it!: solids, liquids, gases and you. Toronto: Kids Can Press.  Solid Liquid Gas Activities | The Homeschool Den. (n.d.). The Homeschool Den RSS. Retrieved November 16, 2013, from http://www.parents.com/blogs/homeschool-den/tag/solid-liquid-gas-activities/  Matter Rap. (2011, January 31). YouTube. Retrieved November 16, 2013, from http://www.youtube.com/watch?v=oAqompxk7fY&feature=related | | |

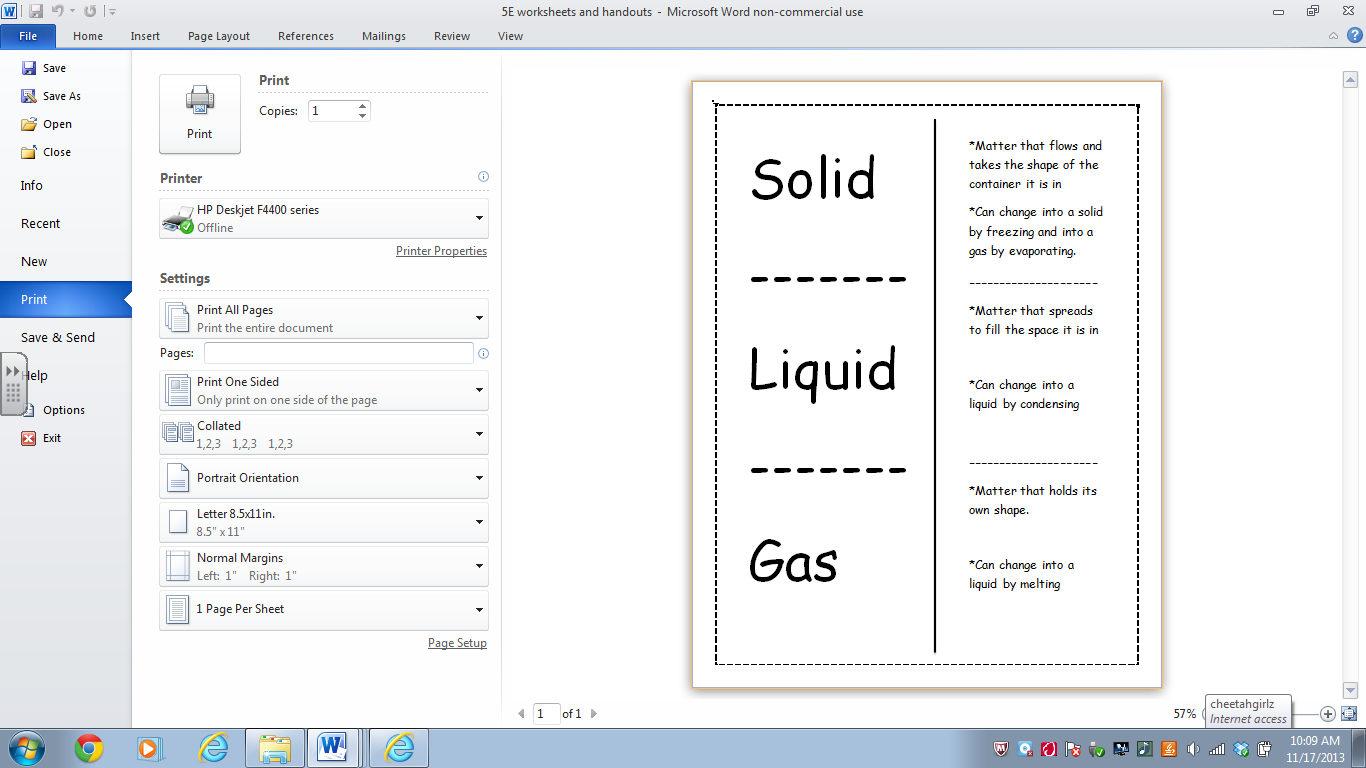
1. **Daily Procedures**

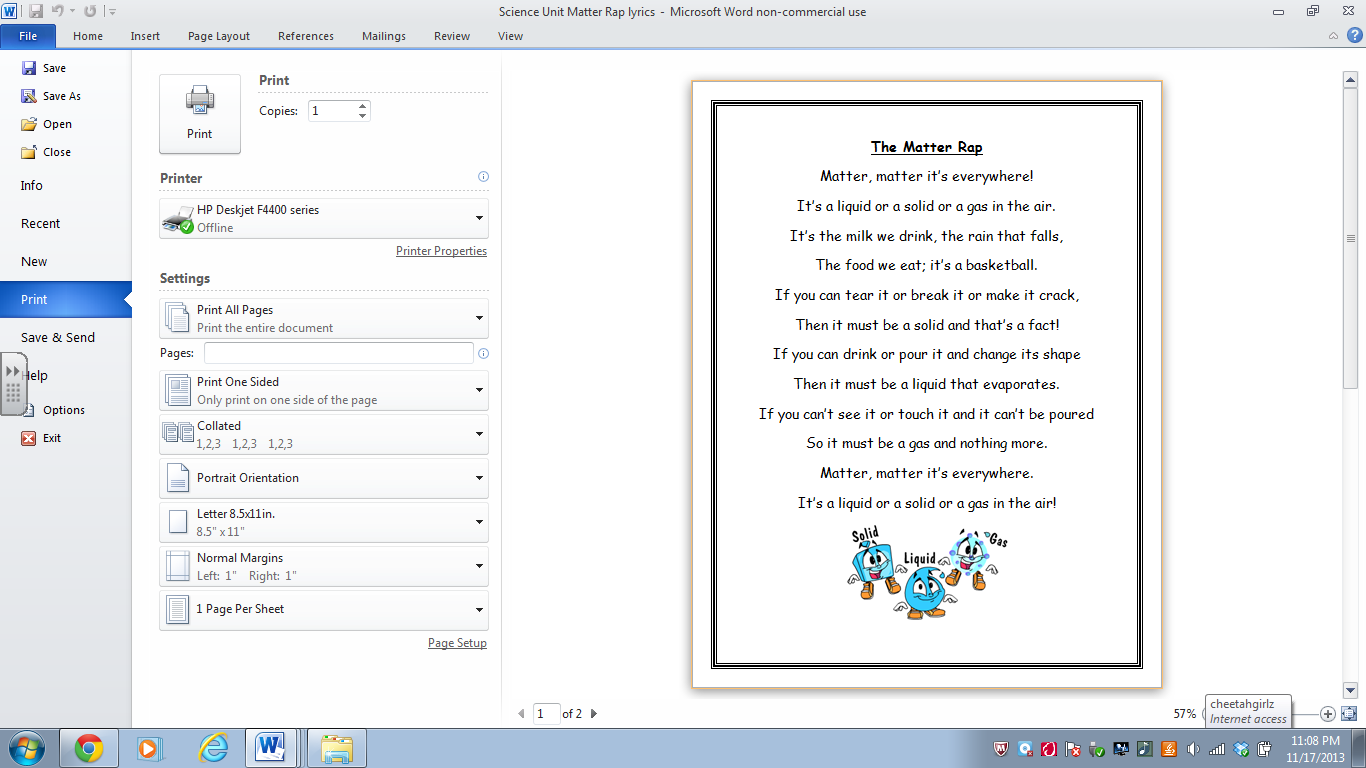
|  |  |
| --- | --- |
| **ENGAGEMENT PHASE – *Introduce lesson and capture student interest*.** | **Estimated Time:** 2 minutes |
| **Directions**   1. *Please come join me at the community center* 2. *In each of these balloons, there is a different state of matter.* 3. *We are going to explore what we think is inside each balloon.* 4. *Before I pass the balloon around, I need to make sure everyone is sitting on their bottom. Make sure to handle each balloon with care. Do not squeeze the balloons. Unfortunately, I will have you clip down and sit out if you cannot handle the materials appropriately.* 5. *Is everyone ready to explore and predict?* | **Key Questions**  *1. Does anyone know what the three states of matter are? (solid, liquid and gas)* |
| **EXPLORATION PHASE – *Hands-on/minds-on student-centered inquiry activity*.** | **Estimated Time:** 5 minutes |
| **Directions**   1. I will pass around the first balloon with air. 2. I will label the balloon with the students’ prediction. 3. I will pass around the second ballon with water. 4. I will label the balloon with the students’ prediction. 5. I will pass around the third balloon with ice. 6. I will label the balloon with the students’ prediction. 7. Put balloons aside in bowl/tub. | **Key Questions**  *1. What do you predict is inside this balloon? (air) Why do you think there is air inside? (because it’s light and I don’t feel or hear anything inside) Would air be a solid, liquid or gas? (gas)*  *2. What do you predict is inside this balloon? (water) Why do you think there is water inside? (because I can feel and hear it sloshing around) Would water be a solid, liquid or gas? (liquid)*  *3. What do you predict is inside this balloon? (ice) Why do you think there is ice inside? (because it’s hard and cold) Would ice be a solid, liquid or gas? (solid)* |
| **EXPLANATION PHASE – *Discuss exploration results, define concepts and explain concepts*.** | **Estimated Time:** 8 minutes |
| **Directions**  **Reading Curriculum Connection**   1. I will then read “Change It!” 2. *The book we are going to read will help us define what is inside each of our balloons. It defines and describes solids, liquids and gases. I will need you to stay quiet while I read so that everyone can hear.* 3. *Let’s open our solid balloon to see if what is inside matches this definition of a solid.* 4. I will cut open the balloon and reveal ice colored with food coloring. 5. *You were right! It is ice!*   6. *Let’s open our liquid balloon to see if what is inside matches this definition of a liquid.*  7. I will cut open the balloon and reveal water colored with food coloring.  8. *You were right! It is water!*  *9. Let’s open our gas balloon to see if what is inside matches this definition of a gas.*  10. I will pop the balloon.  11. *You were right! It was air!*  *12. Students, please go back to your seats. We are going to do a quick activity. You will need your science journals, glue and scissors.* | **Key Questions**  1. *Can you find three more solid objects in the picture? (slide, tree, ball)*  *2. Does this ice have a definite shape? (yes) Do you think we were right in predicting that ice is a solid? (yes) If this ice melted, what would it become? (water)*  *3. How many liquids can you find in this picture? (water, pop, rain, juice)*  *4. Does this water hold any particular shape or can it easily change to match the shape of the container it is in? (it can change shape) Do you think we were right in predicting that water is a liquid? (yes) Does anyone know what would happen if this water evaporated? (it would become a gas)*  *5. Did you guys see the gas come out? (no) Then how do you know there was a gas in there? (because gas is all around, even if you can’t see it). So does a gas have any one shape? (no, it spreads out to fill its container). Do you think we were right in predicting that air is a gas? (yes) Do you think this gas could become any other state? (a liquid) Yes! It could become a liquid if it condensed. Very good!* |
| **EXTENSION PHASE – *Apply concepts in hands-on/minds-on student-centered activity*.** | **Estimated Time:** 7 minutes |
| **Directions**   1. I will pass out the flip charts and definition hand out (included below). 2. *Cut along each dotted line and down the thick line down the middle.* 3. *Glue the words solid, liquid and gas onto the front cover of your flip chart. (model)* 4. *On the inside flap, paste the definition that you think best matches the term on the front. For example, if I think this definition describes a solid, I will paste it here. (model)* 5. *When you are done, please close your journal. I will come around and collect it. Once I have your journal, please clean up your desk area.* 6. *We have one more thing to do so please stay focused so that you can get your work done.* | **Key Questions**  *Does anyone have any questions?* |
| **EVALUATION PHASE – *Describe how and in which 5E phase each objective will be assessed. There should be some type of informal and/or formal assessment in each Exploration, Explanation, and Extension phase*.** | **Estimated Time:** 10 minutes |
| Objective 1 will be assessing in the extension and evaluate phase. Students will complete the flip chart activity in the extension phase. I will review their charts during the evaluation phase to determine students’ level of understanding and effectiveness of my teaching. | |
| **CLOSURE – *Finish lesson by helping students think about what was important today*.** | **Estimated Time:** 2 minutes |
| **Language Arts Curriculum Connection – Poetry (Will occur each day)**  To conclude, I will pass out lyrics to the matter rap. Students will listen to the rap and watch the youtube video on the SmartBoard. They will then sing along the second time it is played. The lyrics will help reinforce what was learned in a fun way.  *Before we leave for the day, can a few people share with me something new they learned today. (A gas can become a liquid; Solids, liquids and gases are called states of matter)* | |

1. **Enrichment**

Students can have a states of matter hunt throughout the day. Especially during lunch and recess, students can label objects around them as a solid, liquid or gas. This can continue once they go home for the day. They can write what they find in their journals.

1. **Insert handouts for Day 1 here.**





**ECE Science Daily Lesson Plan**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Teacher Candidate’s Name: | | Breanna Wisnor | Date: | Monday 12/2/13 and Tuesday 12/3/13 |
| Grade Level: 3rd | Lesson Title/Topic:Matter Interactions/Solid or Liquid? | | | Day:2 |

1. **Lesson Rationale:** *A rationale briefly explains in paragraph form:*

Students will be learning this lesson a week after the introduction of the lesson. For this reason, I will need to spend time reviewing on this day. Students will draw a picture of a solid, liquid and gas next to each term on the front of their flip chart to review. We will then conduct an experiment to observe the interactions of solids, liquids and gases. We will label each ingredient in the experiment as a solid, liquid or gas. Students will then make predictions on what will happen based on what they remember about states of matter. I will then have students expand their knowledge of what solids and liquids are by touching oobleck. They will then write down their thoughts and defend their position in their journals. We will conclude the lesson with students rapping the states of matter rap to reinforce definitions and descriptions of each.

1. **Content Focus: Essential Question or Enduring Understanding:** *This is a question or statement that directly targets the learning/inquiry in which your students will participate. It focuses on your planning, instruction and assessment. Big Ideas go here!*

How are solids, liquids and gases related and how do they interact?

What is the difference between a solid and a liquid?

1. **2002 Standard, Benchmark and Indicator(s) *OR* 2010 Strand, Topic and Content Statement(s):**

|  |
| --- |
| ***Write the 2002 (old) standards****. Include standards, benchmarks and indicators addressed by this lesson (include the content, science and technology scientific inquiry and scientific ways of knowing standards).*  Click here to enter the 2002 standards, benchmarks, and indicators. |
| ***Write the 2010 (revised) standards****. Include the strand (e.g., Earth & Space, Physical, Life), Topic (e.g., for 6th grade: Rocks, Minerals and Soil; Matter and Motion; Cellular to Multicellular), and portions of the content elaboration statements that are addressed by this lesson (e.g., for 6th grade: Minerals have properties that can be observed and measured.).*  **Common Core State Standards**  *Domain:* Physical Science: Matter: Properties and Change  *Cluster:* Understand the structure and properties of matter before and after they undergo a change  *Standard:* 3.P.2.1 *Text of objective:* Recognize that air is a substance that surrounds us, takes up space and has mass.  *Standard:* 3.P.2.2 *Text of objective:* Compare solids, liquids, and gases based on their basic properties. |
| ***Write your lesson’s objectives****. These should be measurable and specific statements indicating what you want students to be able to say or do upon completion of the lesson and the conditions under which students will be assessed. The statement should use active verbs (Bloom’s taxonomy is a good source) and be worded so that the desired learning is observable. (e.g., Given time and materials to collect data, TSSBAT determine the type of mathematical relationship that exists between temperature and pressure using correct terminology; Given velocity word problems, TSSBAT solve the problems by setting up equations and finding the missing variable; Given a short answer question, TSSBAT define temperature as the measure of thermal energy; Given drawing materials, TSSBAT use a drawing to explain how convection currents in the mantle cause crustal plates to move; Given time and materials, TSSBAT evaluate the efficacy of two different fertilizer regimens on the growth of radish plants based on experimental results.)*  *Number of statements will vary, but they should be few & focused enough to accomplish in time allotted. If you have more than one objective, number them here.*   1. After reviewing definitions of each state of matter, students will be able to describe and defend their position on whether oobleck is a solid or a liquid. |

1. **Academic Language:** In a bulleted list, provide thespecialized content terms/vocabulary that students will need to know (*erosion, democracy, perimeter, onomatopoeia*). Define the specialized vocabulary in terms children in your grade can understand. Also list the general academic language (*compare, contrast, analyze, explain, synthesize,* etc.) that students need to understand in order to complete your academic tasks.

* Define-give a definition
* Describe-explain your reasoning
* Defend-back up your reasoning with facts
* Interactions-responses
* Expand-to make bigger
* Matter-any substance-solid, liquid or gas-that takes up space
* Solid-matter that holds its own shape
* Liquid-matter that flows and takes the shape of the container it is in
* Gas-matter that spreads to fill the space it is in

1. **Academic Demand:** *Explain by each 5E phase how your lesson is designed to help children develop or reinforce their understanding of the required academic language so that they are able to effectively communicate orally and in writing their thinking and knowledge*.

In the engage phase, students will use the terms solid, liquid, gas, interaction and expand to describe what is happening in the experiment. During the explore phase, students will be touching the oobleck and using the terms solid and liquid to describe the texture. During the explain phase, they will explain their reasoning as to whether oobleck is a liquid or a solid. During the extension, students will explain their reasoning by defending their opinion with facts. They will write a few sentences in their journal defending their position after a think, pair, share activity. To evaluate, I will listen to their reasoning to determine how well they understand these terms. I will also collect their journals to see what pictures they drew to remind them of the meaning of the terms solid, liquid and gas. I will also read their position on whether oobleck is a solid or a liquid.

1. **Planned Assessments:** *Indicate the types of assessments you plan to utilize in your lesson, and then indicate within your plan where each will be implemented. (Not all types are needed in each lesson.) Be sure assessments are clearly aligned with lesson objectives.*

|  |  |
| --- | --- |
| *Pre-assessment:* | I will use the previous day’s journal activity as the pre-assessment for this day. I will also pre-assess by observing what students draw to describe solids, liquids and gases. |
| *Formative Assessment:* | I will formatively assess throughout the unit by listening to student explanations during the engagement, explore and extend phases. |
| *Summative Assessment:* | I will collect the students’ journals to see what they drew for their picture of a solid, liquid and gas. I will also use their written explanations of oobleck as a liquid or solid and their reasoning to determine how thoroughly students understand this concept. |

1. **Differentiated Instructional Strategies:** *In a bulleted list, indicate the accommodations you will provide for individuals and subgroups within your class: accelerated learners, English Language Learners*, *as well as learners with special needs. If you do not have students identified as gifted, please list accommodations you could make for students who seem accelerated in science compared to other students. If you do not have students with IEPs or 504 plans, please list accommodations you could make for students who seem to have difficulties organizing, reading/comprehending, reasoning independently, remembering, etc. (Accommodating does* ***not*** *mean simply requiring students to do more or less; it means helping them access content & produce satisfactory work in ways best suited to their academic needs. This might include teacher modeling, utilizing graphic organizers, translation websites, differentiated reading materials, etc.) Do not leave any section blank.*
2. **Gardner’s Multiple Intelligences**

* Visual/spatial – flip chart
* Bodily kinesthetic – motions with rap
* Musical – states of matter rap
* Interpersonal – whole group discussion on experiment and oobleck
* Intrapersonal – defending their opinion on oobleck as a solid or liquid
* Linguistic – verbally explaining their opinions
* Logical/mathematical – logically explaining terms and definitions

1. **Accelerated Learners**

* I will challenge my accelerated student to determine if oobleck can be both a solid and a liquid.

1. **English Language Learners**

* I will allow my ELL students to verbally explain their reasoning instead of also having to write it down in their journal.

1. **Students with Special Needs**

* I will allow my student on a 504 to draw a picture to explain her reasoning rather than having to write her explanation in words. For my ED student with an IEP, I will monitor his behavior and allow him to take breaks whenever needed.

1. **Resources:** *Enter what is needed by each entity for each 5E phase. If a phase is not performed today, state the day it will be or was performed in this learning cycle. If nothing is needed by an entity, type “none” in the cell.*

|  |  |  |  |
| --- | --- | --- | --- |
| 1. **Materials:** | Teacher | Small Groups | Individuals |
| Engagement | Balloon  Small funnel  Teaspoon  Baking soda  Vinegar  Pop bottle | none | Science journals with flip charts  Colored pencils/crayons |
| Exploration | Oobleck in three tubs for each table (pre-made) | One tub of oobleck | Science journals |
| Explanation | None | Group members | Science journals |
| Extension | None | None | Science journals |
| Evaluation | Science journals | None | Science journals |
| 1. **Safety Concerns:** | There are no safety concerns for this lesson. To protect against messes, however, I will do the experiment over a tub. For the oobleck, I will only allow one student at a time to touch it and will instruct that it must stay in the bowl. I will allow time afterwards for students to wash their hands in the restroom. | | |
| 1. **Graphic Organizers:** | Students will again be using their flip charts. Today they will recall previous information by drawing a picture of a solid, liquid and gas next to each term. | | |
| 1. **Cooperative Learning:** | Students will examine the oobleck in small groups. They will share their opinions on whether it is a solid or a liquid by thinking to themselves, discussing with their small group and their sharing their thoughts with the whole class. | | |
| 1. **Technology** | We will be watching a youtube video on the States of Matter rap on the SmartBoard. | | |
| 1. **References:** | Solid Liquid Gas Activities | The Homeschool Den. (n.d.). The Homeschool Den RSS. Retrieved November 16, 2013, from <http://www.parents.com/blogs/homeschool-den/tag/solid-liquid-gas-activities/>  Science Matters: States of Matter. (n.d.). Science Matters: States of Matter Matter. Retrieved November 16, 2013, from http://science-mattersblog.blogspot.com/search/label/States%20of%20Matter  Matter Rap. (2011, January 31). YouTube. Retrieved November 16, 2013, from http://www.youtube.com/watch?v=oAqompxk7fY&feature=related | | |

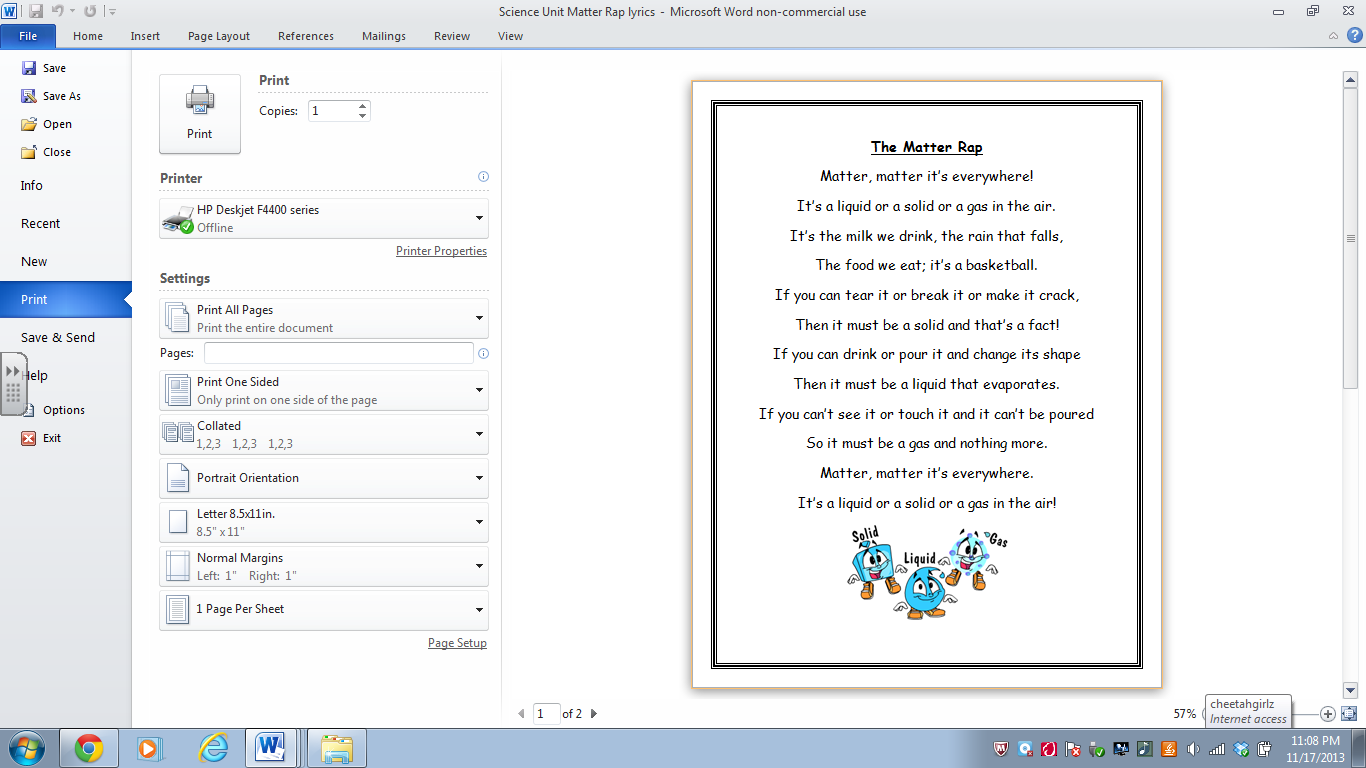
1. **Daily Procedures**

|  |  |
| --- | --- |
| **ENGAGEMENT PHASE – *Introduce lesson and capture student interest*.** | **Estimated Time:** 10 minutes |
| **Directions**   1. As students enter the room, I will pass back their journals and instruct them to open to their flip chart page. 2. *On the cover, I want you to draw a picture of a solid, liquid and gas to help you remember what each of these are. For example, you may want to draw a rain puddle next to liquid to help you remember that liquids do not have any definite shape. Please draw your three pictures quickly so that we can begin our experiment for today!*   3. *I have baking soda, a balloon, a bottle and vinegar in front of me.*  a. Pour baking soda into a flat balloon.  b. Pout vinegar into bottle.  c. Without spilling baking soda into vinegar, wrap balloon over top of bottle.  *\*Before letting go, ask students to predict what they think will be the reaction?*  d. Release the baking soda.  e. Watch as the balloon fills with gas.  *4. When the solid was added to the liquid, it created a gas to form. I want you guys to remember this sequence. You will need to recall this information next week with another experiment.* | **Key Questions**  *Which of these ingredients and objects are solids? (baking soda, balloon and bottle)*  *Which are liquids? (the vinegar)*  *Did you notice how the liquid vinegar took the shape of the bottle? (yes)*  *What do you predict will happen when the baking soda hits the vinegar? (the balloon will blow up)*  *Does anyone know what gas the balloon is filled with right now? (carbon dioxide)* |
| **EXPLORATION PHASE – *Hands-on/minds-on student-centered inquiry activity*.** | **Estimated Time:** 5 minutes |
| **Directions**   1. *What we are going to observe next is an interesting substance called Oobleck. Raise your hand if you’ve played with oobleck before.* 2. *If you’ve never played with oobleck, you will notice something very interesting about it.* 3. *I am going to place a bowl of oobleck on each table. Just like we had to handle the balloons appropriately last week, same goes for the oobleck. We need to keep our room clean so if you decide to play inappropriately, you will need to sit out for the rest the activity. Does everyone understand? Only one person is to be touching the oobleck at a time.* 4. *Go ahead now and pass it around the table.* 5. *As you watch other’s play and as you feel it for yourself, think in your mind whether you think it is a solid or a liquid.* | **Key Questions** |
| **EXPLANATION PHASE – *Discuss exploration results, define concepts and explain concepts*.** | **Estimated Time:** 5 minutes |
| **Directions**  1. Once everyone has had a turn to touch the oobleck, I will ask students to raise their hand if they think it is a liquid. I will then ask students to raise their hand if they think it is a solid.  *2. Take the next few minutes to share with your partner why you think it is a solid or a liquid. (Students will discuss for 2 min)*  3. Students will then share their ideas with the class. | **Key Questions**  *Who thinks oobleck is a solid? (Call on student who has their hand raised). Why do you think it is a solid? (because it’s hard) Does anyone have another reason why they think oobleck is a solid? (because it has a shape)*  *Who thinks oobleck is a liquid? (Call on students who has their hand raised). Why do you think it is a liquid? (because it’s runny) Does anyone else have another reason why they think oobleck is a liquid? (because its shape fills the container)* |
| **EXTENSION PHASE – *Apply concepts in hands-on/minds-on student-centered activity*.** | **Estimated Time:** 5 minutes |
| **Directions**   1. I will then collect the oobleck from each table and dismiss students one table at a time to wash their hands. While students wait, they will write in their journal why they think oobleck is a liquid or solid. Students must back up their opinion with facts. For example, “I think oobleck is a liquid because it is loose and its shape fills the container. It can be poured between your fingers. It is wet and runny like water.” | **Key Questions**  *In your journals, answer the question ‘Is oobleck a solid or a liquid?’ Back up your opinion with facts. For example, do not simply write liquid. Tell me why. Use your flip chart to help you remember the definitions of solid and liquid. Use the definitions to defend, or back up, your opinion.* |
| **EVALUATION PHASE – *Describe how and in which 5E phase each objective will be assessed. There should be some type of informal and/or formal assessment in each Exploration, Explanation, and Extension phase*.** | **Estimated Time:** 5 minutes |
| I will informally assess during each phase by walking around and observing students’ written responses. I will also listen to students’ verbal responses. I will assess the objective in the evaluate phase by collecting their journals and checking for understanding. I will make sure students’ illustrations correctly display the term it is depicting. I will also make sure students back up their opinion with facts about liquids or solids. | |
| **CLOSURE – *Finish lesson by helping students think about what was important today*.** | **Estimated Time:** 2 minutes |
| To conclude the lesson, students will sing along to the matter rap video on the SmartBoard. This will reinforce vocabulary and key ideas about states of matter. | |

1. **Enrichment**

To reinforce learning, students could observe other changes in states of matter by cooking at home with their parents and observing how food and water change when heat is applied. For example, solid chocolate can be melted into a liquid. Water (liquid) that is boiled will release steam or water vapor (gas). These are just a few examples students may obseve.

1. **Insert handouts for Day 2 here.**



**ECE Science Daily Lesson Plan**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Teacher Candidate’s Name: | | Breanna Wisnor | Date: | Monday, 12/9/13 and Tuesday 12/10/13 |
| Grade Level: 3rd | Lesson Title/Topic:Molecules in Motion | | | Day:3 |

1. **Lesson Rationale:** Up until this lesson, the students have only defined and described solids, liquids and gases and learned about how everything is made of matter. Today, they will explore solids, liquids and gases deeper by learning how the molecules move and what they look like in solids, liquids and gases. This is important because it addresses the third standard within the domain of physical science, matter, properties and change. By learning more about the molecules within solids, liquids and gases, students will have a better understanding of the properties of each and how they are able to change from one form to another. For this lesson, students will be moving and making sound to demonstrate how molecules in solids, liquids and gases move. This will engage students and allow them to move. Teaching the motion of molecules in an interactive way will help the students learn to make connections without having to memorize definitions or be overwhelmed with an in-depth description.
2. **Content Focus: Essential Question or Enduring Understanding:** *This is a question or statement that directly targets the learning/inquiry in which your students will participate. It focuses on your planning, instruction and assessment. Big Ideas go here!*

How do molecules move through in state of matter?

1. **2002 Standard, Benchmark and Indicator(s) *OR* 2010 Strand, Topic and Content Statement(s):**

|  |
| --- |
| ***Write the 2002 (old) standards****. Include standards, benchmarks and indicators addressed by this lesson (include the content, science and technology scientific inquiry and scientific ways of knowing standards).*  Click here to enter the 2002 standards, benchmarks, and indicators. |
| ***Write the 2010 (revised) standards****. Include the strand (e.g., Earth & Space, Physical, Life), Topic (e.g., for 6th grade: Rocks, Minerals and Soil; Matter and Motion; Cellular to Multicellular), and portions of the content elaboration statements that are addressed by this lesson (e.g., for 6th grade: Minerals have properties that can be observed and measured.).*  **Common Core State Standards**  *Domain:* Physical Science: Matter: Properties and Change  *Cluster:* Understand the structure and properties of matter before and after they undergo a change  *Standard:* 3.P.2.1 *Text of objective:* Recognize that air is a substance that surrounds us, takes up space and has mass.  *Standard:* 3.P.2.2 *Text of objective:* Compare solids, liquids, and gases based on their basic properties.  *Standard:* 3.P.2.3 *Text of Objective:* Summarize changes that occur to the observable properties of materials when different degrees of heat are applied to them, such as melting ice or ice cream, boiling water or an egg, or freezing water. |
| ***Write your lesson’s objectives****. These should be measurable and specific statements indicating what you want students to be able to say or do upon completion of the lesson and the conditions under which students will be assessed. The statement should use active verbs (Bloom’s taxonomy is a good source) and be worded so that the desired learning is observable. (e.g., Given time and materials to collect data, TSSBAT determine the type of mathematical relationship that exists between temperature and pressure using correct terminology; Given velocity word problems, TSSBAT solve the problems by setting up equations and finding the missing variable; Given a short answer question, TSSBAT define temperature as the measure of thermal energy; Given drawing materials, TSSBAT use a drawing to explain how convection currents in the mantle cause crustal plates to move; Given time and materials, TSSBAT evaluate the efficacy of two different fertilizer regimens on the growth of radish plants based on experimental results.)*  *Number of statements will vary, but they should be few & focused enough to accomplish in time allotted. If you have more than one objective, number them here.*   1. After a brief explanation, students will be able to demonstrate what the molecules in a solid, liquid and gas look like and how they move based on their kinetic energy. |

1. **Academic Language:** In a bulleted list, provide thespecialized content terms/vocabulary that students will need to know (*erosion, democracy, perimeter, onomatopoeia*). Define the specialized vocabulary in terms children in your grade can understand. Also list the general academic language (*compare, contrast, analyze, explain, synthesize,* etc.) that students need to understand in order to complete your academic tasks.

* Matter-any substance-solid, liquid or gas-that takes up space
* Solid-matter that holds its own shape
* Liquid-matter that flows and takes the shape of the container it is in
* Gas-matter that spreads to fill the space it is in
* Kinetic energy-energy an object has due to its motion or movement
* Atom- smallest piece of an element that keeps the properties of the element
* Molecule- two or more atoms held together by chemical bonds

1. **Academic Demand:** *Explain by each 5E phase how your lesson is designed to help children develop or reinforce their understanding of the required academic language so that they are able to effectively communicate orally and in writing their thinking and knowledge*.

To engage students, I will do a demonstration with bouncy balls in a container to demonstrate how molecules in a solid, liquid and gas move. During the engagement, we will discuss the terms solid, liquid, gas and kinetic energy. On the SmartBoard, students will drag phrases describing solids, liquids and gases into the correct bubble on a tri-circle Venn diagram. Next, I will review a graphic organizer on the SmartBoard that describes the molecules in solids, liquids and gases. Students will have a copy of this handout in front of them. We will then move around the room as if we were molecules in liquid and gas. Half of the students will be moving molecules and half will be musical molecules that will pat their knees to demonstrate the speed of the molecules. Students will then use their knowledge of these terms to draw pictures on their flip charts of what the molecules in solids, liquids and gases look like. To conclude, students will sing the matter rap to recall the terms matter, solid, liquid and gas.

1. **Planned Assessments:** *Indicate the types of assessments you plan to utilize in your lesson, and then indicate within your plan where each will be implemented. (Not all types are needed in each lesson.) Be sure assessments are clearly aligned with lesson objectives.*

|  |  |
| --- | --- |
| *Pre-assessment:* | To pre-assess, I will use the journal activity from the previous lesson to determine if I need to clarify any information about solids, liquids or gases. |
| *Formative Assessment:* | During the lesson, I will formatively assess during the engagement SmartBoard Venn diagram activity and by observing students during the molecule movement and music activity to determine who understands this concept and who still seems to be struggling. |
| *Summative Assessment:* | At the end of the lesson, students will draw a picture on the inside of each flap of their flip chart to display what the molecules in a solid, liquid and gas look like. I will collect their journals at the end of the lesson. |

1. **Differentiated Instructional Strategies:** *In a bulleted list, indicate the accommodations you will provide for individuals and subgroups within your class: accelerated learners, English Language Learners*, *as well as learners with special needs. If you do not have students identified as gifted, please list accommodations you could make for students who seem accelerated in science compared to other students. If you do not have students with IEPs or 504 plans, please list accommodations you could make for students who seem to have difficulties organizing, reading/comprehending, reasoning independently, remembering, etc. (Accommodating does* ***not*** *mean simply requiring students to do more or less; it means helping them access content & produce satisfactory work in ways best suited to their academic needs. This might include teacher modeling, utilizing graphic organizers, translation websites, differentiated reading materials, etc.) Do not leave any section blank.*
2. **Gardner’s Multiple Intelligences**

* Visual/spatial – graphic organizers and flip chart
* Bodily kinesthetic – molecule movement and motions with rap
* Musical – molecule music and states of matter rap
* Interpersonal – demonstrating molecules in 2 groups
* Intrapersonal – drawing pictures of liquids, solids and gases
* Linguistic – verbally explaining answers
* Logical/mathematical – logically explaining terms and definitions and how molecules move

1. **Accelerated Learners**

* I will have my accelerated student be the conductor and choreographer. He will help lead the class in making music and movements.

1. **English Language Learners**

* For my ELL students, I will incorporate pictures within the graphic organizers to help them make visual connections. I will also use the graphic organizer to point to the state of matter we are representing during the molecule movement and music activity.

1. **Students with Special Needs**

* I will put my student on a 504 plan in the same group as my gifted student for the movement and music activity so that she knows she has someone to watch should she could confused. For my ED student with an IEP, I will monitor his behavior and allow him to take breaks whenever needed.

1. **Resources:** *Enter what is needed by each entity for each 5E phase. If a phase is not performed today, state the day it will be or was performed in this learning cycle. If nothing is needed by an entity, type “none” in the cell.*

|  |  |  |  |
| --- | --- | --- | --- |
| 1. **Materials:** | Teacher | Small Groups | Individuals |
| Engagement | Small, clear jar  Bouncy balls | none | none |
| Exploration | Will do on Day 4 | Will do on Day 4 | Will do on Day 4 |
| Explanation | Graphic organizers on SmartBoard | none | Graphic organizer handout |
| Extension | Graphic organizer and pointer | none | Only their bodies |
| Evaluation | none | none | Science journals  Pencil/colored pencil |
| 1. **Safety Concerns:** | To make sure students are safe when moving, I will split the class in half so that only 10 students are moving at once. The students who are moving will be reminded that they must be aware of where others are in space. Students will be reminded that any student who does not play appropriately will have to sit out. | | |
| 1. **Graphic Organizers:** | The Venn diagram on the SmartBoard will be an excellent graphic organizer to organize similarities and differences between solids, liquids and gases. The students will also be a given a graphic organizer handout explaining the molecules in each state. Both of these are included at the end of this lesson. | | |
| 1. **Cooperative Learning:** | There is no cooperative learning in this activity. There will be a cooperative activity in the next day’s lesson. | | |
| 1. **Technology Integration:** | Students will move phrases into correct section of a three-circle Venn Diagram on the SmartBoard. Technology will be integrated by playing the Matter Rap video on the SmartBoard. | | |
| 1. **References:** | Matter Rap. (2011, January 31). YouTube. Retrieved November 16, 2013, from http://www.youtube.com/watch?v=oAqompxk7fY&feature=related  Science Matters: States of Matter. (n.d.). Science Matters: States of Matter. Retrieved November 16, 2013, from http://science-mattersblog.blogspot.com/search/label/States%20of%20Matter  Solid Liquid Gas Activities | The Homeschool Den. (n.d.). The Homeschool Den RSS. Retrieved November 16, 2013, from http://www.parents.com/blogs/homeschool-den/tag/solid-liquid-gas-activities/ | | |

1. **Daily Procedures**

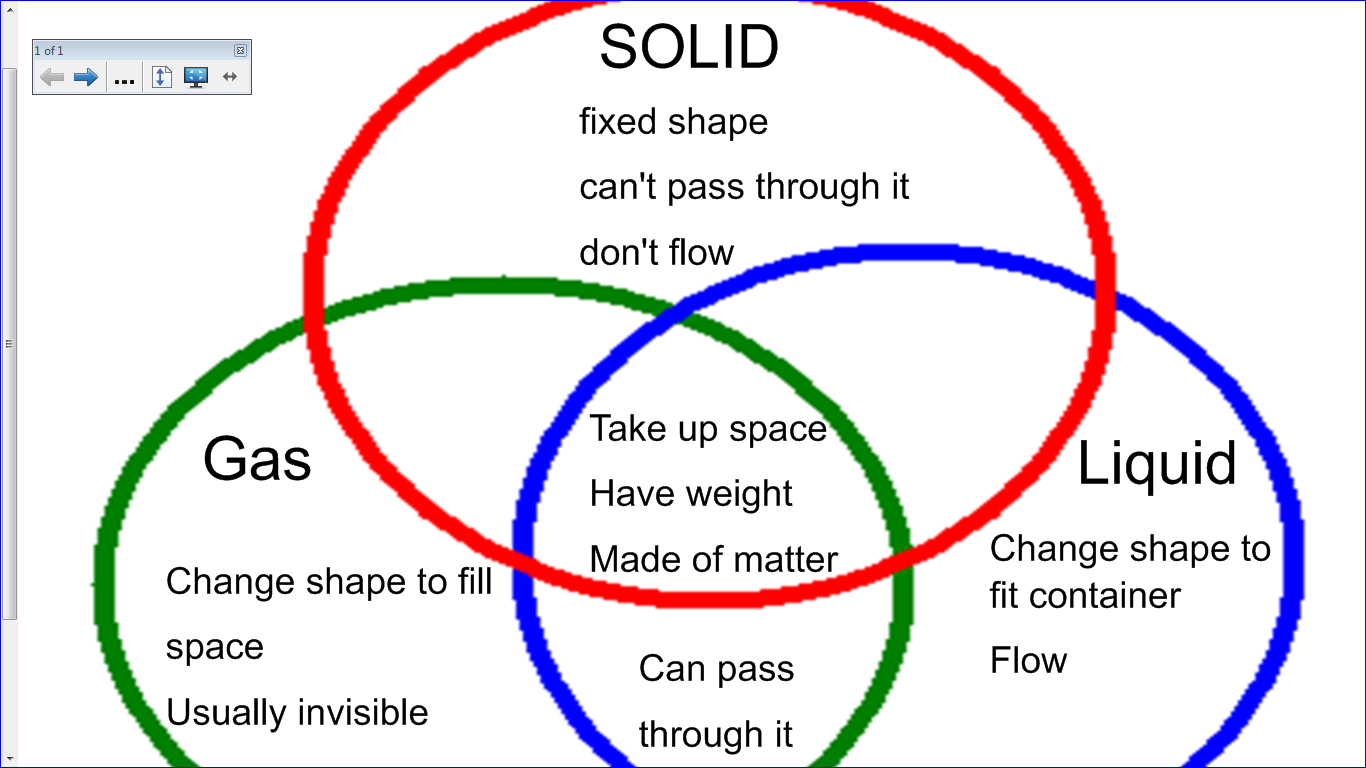
|  |  |
| --- | --- |
| **ENGAGEMENT PHASE – *Introduce lesson and capture student interest*.** | **Estimated Time:** 2 minutes |
| **Directions**   1. To introduce the lesson, I will have about ten bouncy balls in a clear, plastic jar. To demonstrate how molecules move in a solid, I will barely shake the container very slowly. *Watch the bouncy balls as I shake this jar.*   *This is how molecules in a solid move. There is less kinetic energy because there is not enough movement to get the molecules moving fast. There is kinetic energy in solids but not enough to separate individual molecules from the group.*  *Watch the bouncy balls now as I shake the jar now.* This time I will shake the container a little harder so that the group of balls all moves together. *The molecules in a liquid have more kinetic energy than the molecules in solid but they still have to stay attached to one another.*  *Now watch how molecules in a gas move. There is a lot of kinetic energy which causes the balls to move faster and further apart so that they can fill the empty space.* | **Key Questions**  *Do you see how they are moving a little bit but are pretty much staying in the same place?*  *So which has the most kinetic energy? Solids, liquids or gases? (gases)Right! Remember, kinetic energy is the* energy an object has due to its motion or movement.  Which has the least kinetic energy? (Solids) Right, because the molecules in solids are tightly packed and cannot move around. |
| **EXPLORATION PHASE – *Hands-on/minds-on student-centered inquiry activity*.** | **Estimated Time:** not included in this lesson |
| **Directions** | **Key Questions** |
| **EXPLANATION PHASE – *Discuss exploration results, define concepts and explain concepts*.** | **Estimated Time:** 10 minutes |
| **Directions**   1. Next, I will pull up a three-circle Venn Diagram on the SmartBoard. I will have students place phrases under the correct heading. A screen shot of the finished diagram can be found following this lesson. 2. I will explain how to read and use the diagram. 3. I will choose one student to come up to the board and move a phrase under the correct heading. 4. *The next slide shows us where everything should go.* 5. Next I will pass out the graphic organizer attached following this lesson. 6. We will read through this handout and discuss it as a class. 7. *Please hold onto these worksheets. They will be a great reference this week.* 8. *Please join me now over at the community center.* | **Key Questions**  *Does* everyone agree with this or do we think anything should be moved?  *Were we right? Do we need to move anything around?* |
| **EXTENSION PHASE – *Apply concepts in hands-on/minds-on student-centered activity*.** | **Estimated Time:** 10 minutes |
| **Directions**   1. *We are going to move like molecules!* I will then divide the class in half. *If you were a 1, please stay sitting on the carpet. If you were a 2, please sit the desks behind us.* 2. *If you are a one, stand up.* 3. *I am going to call out different states of matter. If you’re on the carpet, you need to move like the molecules in that state of matter. If you’re sitting in the desks, you need to tap the desk with your hands to match the speed the molecules should be moving in.* 4. *For example, if I call out “solid!” You will all need to get close together in a cluster and barely move and people sitting in desks will need to tap the desk slowly.*   5. *I just want to remind everyone that if we can’t play appropriately, we will have to sit out. In this activity, if you get out of control, you could actually hurt someone else so I need you all to have self-control so that we can all be safe.*  6. I will then call out each state of matter once.  7. The students will then switch roles so that those moving will now me the music makers and the music makers will now be the movers.  8. *Great job everyone! Please head back to your seats and get out your science journals.* | **Key Questions**  *So if I call out, gas… people on the carpet, what are you going to do? (Walk quickly and spread out)*  *If I call out liquid… people sitting, what will you do? (tap the desk kind of fast).*  *Are there any questions before we get started?* |
| **EVALUATION PHASE – *Describe how and in which 5E phase each objective will be assessed. There should be some type of informal and/or formal assessment in each Exploration, Explanation, and Extension phase*.** | **Estimated Time:** 5 minutes |
| *On the inside flap of your flip chart, draw a circle. Inside this circle, draw a picture of what the molecules in that state of matter look like. Hand me your journal on your way out.*  I will assess objective 1 informally during the molecule movement activity to see if students understand how to demonstrate molecule movement. I will check students’ flip chart illustrations to determine if students are able to represent the molecules in each state. | |
| **CLOSURE – *Finish lesson by helping students think about what was important today*.** | **Estimated Time:** 2 minutes |
| To conclude the lesson, students will sing along to the matter rap video on the SmartBoard. This will reinforce vocabulary and key ideas about states of matter. | |

1. **Enrichment**

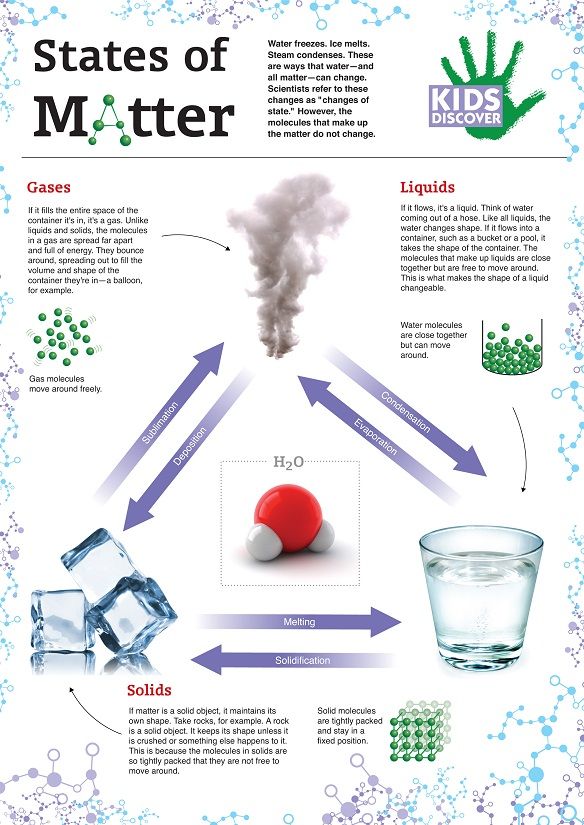
To enrich this lesson, students could play a variation of the molecule movement game at recess. By putting hula hoops on the ground, students could represent what the molecules look like and how they move in each state.

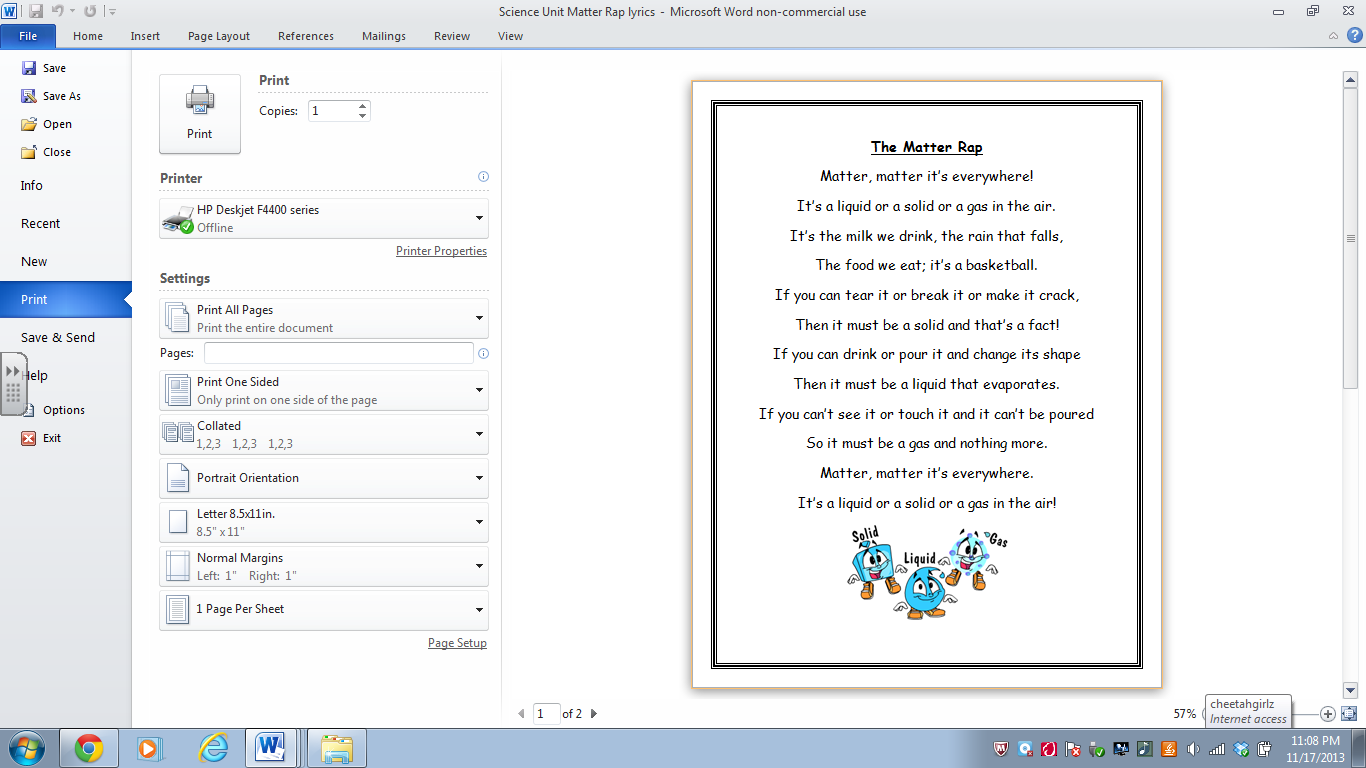
1. **Insert handouts for Day 3 here.**

[](http://2.bp.blogspot.com/_QZsqVJHmBms/S3HCb3uzA0I/AAAAAAAAAOk/Qb1IGZ8ssLo/s1600-h/20100209_3117.JPG) **(Engagement)**



**\*This is what the diagram should look like when finished.**

**[](http://www.kidsdiscover.com/blog/wp-content/uploads/2013/01/States-of-Matter-KIDS-DISCOVER.jpg)**



**ECE Science Daily Lesson Plan**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Teacher Candidate’s Name: | | Breanna Wisnor | Date: | Wednesday, 12/11/13 and Thursday 12/12/13 |
| Grade Level: 3rd | Lesson Title/Topic:What’s the Matter with Root Beer Floats? | | | Day:4 |

1. **Lesson Rationale:** Throughout the duration of this unit, students have been discovering what solids, liquids and gases are and what the molecules in each look like. For this activity, students will be using their prior knowledge to predict what will happen when each ingredient is added. They will also need to recall previously learned terms and definitions to help them label each ingredient as a solid, liquid. This activity is being done on day 4 because it will allow students to think on their own without being given a formal explanation first. This activity will also require students to work in groups to solve problems. For this activity, students will also be singing the matter rap to demonstrate what they learned about solids, liquids and gases throughout the week.
2. **Content Focus: Essential Question or Enduring Understanding:** *This is a question or statement that directly targets the learning/inquiry in which your students will participate. It focuses on your planning, instruction and assessment. Big Ideas go here!*

What are the properties of the three states of matter and how do they interact?

1. **2002 Standard, Benchmark and Indicator(s) *OR* 2010 Strand, Topic and Content Statement(s):**

|  |
| --- |
| ***Write the 2002 (old) standards****. Include standards, benchmarks and indicators addressed by this lesson (include the content, science and technology scientific inquiry and scientific ways of knowing standards).*  Click here to enter the 2002 standards, benchmarks, and indicators. |
| ***Write the 2010 (revised) standards****. Include the strand (e.g., Earth & Space, Physical, Life), Topic (e.g., for 6th grade: Rocks, Minerals and Soil; Matter and Motion; Cellular to Multicellular), and portions of the content elaboration statements that are addressed by this lesson (e.g., for 6th grade: Minerals have properties that can be observed and measured.).*  **Common Core State Standards**  *Domain:* Physical Science: Matter: Properties and Change  *Cluster:* Understand the structure and properties of matter before and after they undergo a change  *Standard:* 3.P.2.1 *Text of objective:* Recognize that air is a substance that surrounds us, takes up space and has mass.  *Standard:* 3.P.2.2 *Text of objective:* Compare solids, liquids, and gases based on their basic properties.  *Standard:* 3.P.2.3 *Text of Objective:* Summarize changes that occur to the observable properties of materials when different degrees of heat are applied to them, such as melting ice or ice cream, boiling water or an egg, or freezing water. |
| ***Write your lesson’s objectives****. These should be measurable and specific statements indicating what you want students to be able to say or do upon completion of the lesson and the conditions under which students will be assessed. The statement should use active verbs (Bloom’s taxonomy is a good source) and be worded so that the desired learning is observable. (e.g., Given time and materials to collect data, TSSBAT determine the type of mathematical relationship that exists between temperature and pressure using correct terminology; Given velocity word problems, TSSBAT solve the problems by setting up equations and finding the missing variable; Given a short answer question, TSSBAT define temperature as the measure of thermal energy; Given drawing materials, TSSBAT use a drawing to explain how convection currents in the mantle cause crustal plates to move; Given time and materials, TSSBAT evaluate the efficacy of two different fertilizer regimens on the growth of radish plants based on experimental results.)*  *Number of statements will vary, but they should be few & focused enough to accomplish in time allotted. If you have more than one objective, number them here.*   1. After a quick review of the properties each state of matter, students will be able to make reasonable predictions supported by fact about how they think each ingredient will react. 2. Students will be able to label each ingredient as a solid, liquid or gas. |

1. **Academic Language:** In a bulleted list, provide thespecialized content terms/vocabulary that students will need to know (*erosion, democracy, perimeter, onomatopoeia*). Define the specialized vocabulary in terms children in your grade can understand. Also list the general academic language (*compare, contrast, analyze, explain, synthesize,* etc.) that students need to understand in order to complete your academic tasks.

* Describe-explain your reasoning
* Defend-back up your reasoning with facts
* Reaction-response
* Matter-any substance-solid, liquid or gas-that takes up space
* Solid-matter that holds its own shape
* Liquid-matter that flows and takes the shape of the container it is in
* Gas-matter that spreads to fill the space it is in
* Molecule-two or more atoms bonded together
* Prediction-statement telling what you expect to happen next and why
* Conclusion-describes the end result

1. **Academic Demand:** *Explain by each 5E phase how your lesson is designed to help children develop or reinforce their understanding of the required academic language so that they are able to effectively communicate orally and in writing their thinking and knowledge*.

Aside from making and observing the floats, students will fill out a handout to accompany this lesson. Students will first be asked to draw what molecules look like in each state of matter. This will force to draw upon previous knowledge. This will also require the use of the terms solid, liquid, gas and molecules. Students will then recall properties of each state by labeling the root beer, ice cream and foam as a solid, liquid or gas. Next, students will predict if there will be more foam if ice cream is added before or after the root beer. Students will use prior knowledge to make a reasonable prediction about the reaction. Students will need to describe and defend their position with facts. Will there be more of a gas if a solid is added to a liquid or a liquid is added to a solid? Students will make their prediction with a partner and will then test their theory to conclude whether their prediction was correct or incorrect.

1. **Planned Assessments:** *Indicate the types of assessments you plan to utilize in your lesson, and then indicate within your plan where each will be implemented. (Not all types are needed in each lesson.) Be sure assessments are clearly aligned with lesson objectives.*

|  |  |
| --- | --- |
| *Pre-assessment:* | I will use the journal activity (flip chart drawing of molecules) to determine if students know how molecules move through each state of matter. |
| *Formative Assessment:* | I will formatively assess throughout the lesson by asking students to explain their prediction with reasoning. If students are unable to justify their response, I will remind students of the balloon and bottle experiment. |
| *Summative Assessment:* | I will collect the root beer float work sheet as a summative assessment at the end of this lesson. The worksheet is included at the end of this lesson. |

1. **Differentiated Instructional Strategies:** *In a bulleted list, indicate the accommodations you will provide for individuals and subgroups within your class: accelerated learners, English Language Learners*, *as well as learners with special needs. If you do not have students identified as gifted, please list accommodations you could make for students who seem accelerated in science compared to other students. If you do not have students with IEPs or 504 plans, please list accommodations you could make for students who seem to have difficulties organizing, reading/comprehending, reasoning independently, remembering, etc. (Accommodating does* ***not*** *mean simply requiring students to do more or less; it means helping them access content & produce satisfactory work in ways best suited to their academic needs. This might include teacher modeling, utilizing graphic organizers, translation websites, differentiated reading materials, etc.) Do not leave any section blank.*
2. **Gardner’s Multiple Intelligences**

* Visual/spatial – worksheet with pictures and graphic organizer
* Bodily kinesthetic – motions with rap
* Musical – states of matter rap
* Interpersonal – working with a partner to determine a reasonable prediction
* Intrapersonal – completing the worksheet
* Linguistic – verbally explaining answers
* Logical/mathematical – logically explaining terms and definitions

1. **Accelerated Learners**

* I will challenge my gifted student by requiring him to use the terms solid, liquid, gas in his prediction response. I will also challenge him to connect his thinking to the balloon and bottle experiment and explain how the two experiments are similar.

1. **English Language Learners**

* I will read aloud step-by-step each direction on the worksheet. I will allow my ELL students to draw pictures demonstrating their prediction and conclusion.

1. **Students with Special Needs**

* I will read out loud each step on the worksheet to my student on a 504. I will allow my ED student with an IEP breaks whenever he needs them.

1. **Resources:** *Enter what is needed by each entity for each 5E phase. If a phase is not performed today, state the day it will be or was performed in this learning cycle. If nothing is needed by an entity, type “none” in the cell.*

|  |  |  |  |
| --- | --- | --- | --- |
| 1. **Materials:** | Teacher | Small Groups | Individuals |
| Engagement | Prompting questions | none | none |
| Exploration | none | Worksheets | Worksheet and partner |
| Explanation | none | Explanation of prediction on worksheet | Explanation of prediction of worksheet |
| Extension | 20 cups  Root beer and orange pop (4 2L)  Vanilla ice cream  Straws and spoons | Worksheet to record results and conclusion | Worksheet and partner-record results and conclusion |
| Evaluation | Worksheet | none | Worksheet |
| 1. **Safety Concerns:** | There are no safety concerns for this lesson. I will, however, cover the desks with table cloths to prevent messy spills. If possible, I may also consider conducting this experiment in the cafeteria. | | |
| 1. **Graphic Organizers:** | The worksheet found at the end of this lesson contains a graphic organizer for students to draw the molecules in each state of matter. There is also a mug for students to draw a picture of the experiment. The worksheet is organized to elicit meaningful responses. | | |
| 1. **Cooperative Learning:** | Students will be working in pairs to come up with their predictions. | | |
| 1. **Technology Integration:** | Technology will be utilized by playing the matter rap on the SmartBoard. | | |
| 1. **References:** | Root Beer Float States of Matter. (n.d.). E is for Explore!. Retrieved November 16, 2013, from http://eisforexplore.blogspot.com/search?q=root+beer+float  Matter Rap. (2011, January 31). YouTube. Retrieved November 16, 2013, from http://www.youtube.com/watch?v=oAqompxk7fY&feature=related | | |

1. **Daily Procedures**

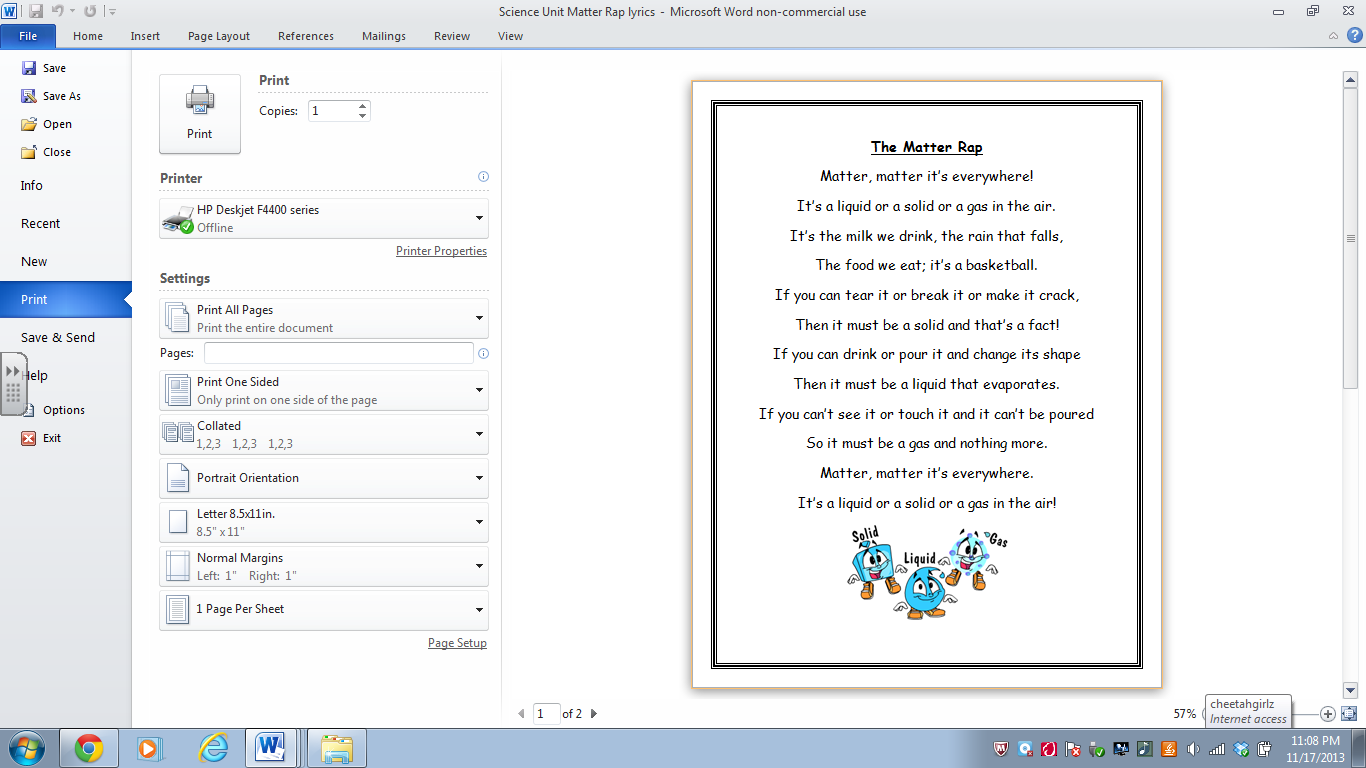
|  |  |
| --- | --- |
| **ENGAGEMENT PHASE – *Introduce lesson and capture student interest*.** | **Estimated Time:** 5 minutes |
| **Directions**   1. To engage the students, I will ask questions to activate prior knowledge and set a purpose for learning. | **Key Questions**  *1. Which of the ingredients in front me is a solid that can be become liquid? (ince cream) Why is it a solid? (it has a shape) How can it become a liquid? (melting)*  *2. Which of the ingredient in front of me is a liquid that can produce a gas? (pop) Why is it a liquid? (it takes the shape of the bottle) What kind of gas can it produce? (fizz)*  *3. Do you think if we combine these ingredients we can create a gas? (yes) What kind of gas?* (foam) |
| **EXPLORATION PHASE – *Hands-on/minds-on student-centered inquiry activity*.** | **Estimated Time:** 5 minutes |
| **Directions**   1. *When you get your handout, please put your name at the top. I will know everyone is ready to begin when all eyes are on me.* 2. *I will leave each of these ingredients up on this front table for you to explore if you like.* 3. *Like a real scientist, we are going to use what we know to make predictions about our experiment.* 4. *First, draw what the molecules in a solid, liquid and gas look like.* 5. *Next, label each ingredient as a solid, liquid or gas.* | **Key Questions**  *Think about our molecule movement activity. How do the molecules in solids, liquids and gases look?*  *Use your flip chart if you need help.* |
| **EXPLANATION PHASE – *Discuss exploration results, define concepts and explain concepts*.** | **Estimated Time:** 5 minutes |
| **Directions**   1. *Now, the next question asks us to make a prediction about the reaction we are going to observe.* 2. *Write down your prediction on whether you think there will be more foam if ice cream is added before or after the root beer. You must also explain your answer. Do not just write first or second, explain why you think adding ice cream first or second would create more foam. Back up your answer with facts!*   *3. Once you have your prediction written down, share your thoughts with your neighbor.* | **Key Questions**  *Think back to our balloon and bottle activity. Did we add the baking soda into the vinegar or did we mix the liquid into the solid to create carbon dioxide?*  *Do you think if we add the solid into the liquid we will have the same effect we did in our balloon and bottle experiment?* |
| **EXTENSION PHASE – *Apply concepts in hands-on/minds-on student-centered activity*.** | **Estimated Time:** 5 minutes |
| **Directions**   1. Students will come up in pairs to observe the reaction. One student will get root beer over ice cream and the second student will get ice cream in their root beer. They will observe which creates more foam and determine if their prediction was correct. 2. *Return to your seat to write down whether your prediction was correct. Have self-control. We are going to eat together.* 3. Once all students are seated, I will tell them before they can eat, they must sing the matter rap! 4. After students sing the matter rap, I will give each student a spoon and a straw so that they can eat their float. | **Key Questions**  1*. Did you guys think there would be more foam if ice cream was added to the root beer or if root beer was added to the ice cream?*  2. *Was your prediction right?* |
| **EVALUATION PHASE – *Describe how and in which 5E phase each objective will be assessed. There should be some type of informal and/or formal assessment in each Exploration, Explanation, and Extension phase*.** | **Estimated Time:** (to be completed throughout the lesson – 5 minutes |
| Both objectives will be assessed using the “Root Beer Float” worksheet included following this lesson. I will grade these worksheets as a pre-assessment for the summative test. | |
| **CLOSURE – *Finish lesson by helping students think about what was important today*.** | **Estimated Time:** 5 minutes |
| To conclude the lesson, students will sing along to the matter rap video on the SmartBoard. This will reinforce vocabulary and key ideas about states of matter. Before students are allowed to eat their floats, they must sing the rap together! | |

1. **Enrichment**

Students could brainstorm other examples of solids added to liquids to create a gas.

1. **Insert handouts for Day 4 here.**





**ECE Science Daily Lesson Plan**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Teacher Candidate’s Name: | | Breanna Wisnor | Date: | Friday, 12/13/13 |
| Grade Level: 3rd | Lesson Title/Topic:What matters about matter?/ Review and Assessment Day | | | Day:5 |

1. **Lesson Rationale:** It is important that I briefly review the material because this lesson was spread out over several weeks. Also, science is taught only every other day and the students being assessed will not have heard the information in two days. It is important that I conduct a summative assessment so that I know what my students have learned and how effective I was in teaching. I will use these assessment results to determine student progress before and after teaching. This will be a reflection on how much my students have learned and how effective I have been in teaching this unit.
2. **Content Focus: Essential Question or Enduring Understanding:** *This is a question or statement that directly targets the learning/inquiry in which your students will participate. It focuses on your planning, instruction and assessment. Big Ideas go here!*

Where is matter, what are the three states of matter, how are the three states defined and what do the molecules in each look like?

1. **2002 Standard, Benchmark and Indicator(s) *OR* 2010 Strand, Topic and Content Statement(s):**

|  |
| --- |
| ***Write the 2002 (old) standards****. Include standards, benchmarks and indicators addressed by this lesson (include the content, science and technology scientific inquiry and scientific ways of knowing standards).*  Click here to enter the 2002 standards, benchmarks, and indicators. |
| ***Write the 2010 (revised) standards****. Include the strand (e.g., Earth & Space, Physical, Life), Topic (e.g., for 6th grade: Rocks, Minerals and Soil; Matter and Motion; Cellular to Multicellular), and portions of the content elaboration statements that are addressed by this lesson (e.g., for 6th grade: Minerals have properties that can be observed and measured.).*  **Common Core State Standards**  *Domain:* Physical Science: Matter: Properties and Change  *Cluster:* Understand the structure and properties of matter before and after they undergo a change  *Standard:* 3.P.2.1 *Text of objective:* Recognize that air is a substance that surrounds us, takes up space and has mass.  *Standard:* 3.P.2.2 *Text of objective:* Compare solids, liquids, and gases based on their basic properties.  *Standard:* 3.P.2.3 *Text of Objective:* Summarize changes that occur to the observable properties of materials when different degrees of heat are applied to them, such as melting ice or ice cream, boiling water or an egg, or freezing water. |
| ***Write your lesson’s objectives****. These should be measurable and specific statements indicating what you want students to be able to say or do upon completion of the lesson and the conditions under which students will be assessed. The statement should use active verbs (Bloom’s taxonomy is a good source) and be worded so that the desired learning is observable. (e.g., Given time and materials to collect data, TSSBAT determine the type of mathematical relationship that exists between temperature and pressure using correct terminology; Given velocity word problems, TSSBAT solve the problems by setting up equations and finding the missing variable; Given a short answer question, TSSBAT define temperature as the measure of thermal energy; Given drawing materials, TSSBAT use a drawing to explain how convection currents in the mantle cause crustal plates to move; Given time and materials, TSSBAT evaluate the efficacy of two different fertilizer regimens on the growth of radish plants based on experimental results.)*  *Number of statements will vary, but they should be few & focused enough to accomplish in time allotted. If you have more than one objective, number them here.*   1. After a quick review of major concepts, students will be able to state that everything is made of matter. 2. Students will be able to state that states of matter can change from one state to another. 3. Students will be able to label objects as solids, liquids or gases. 4. Students will be able to draw a representation of what the molecules in a solid, liquid and gas look like. 5. Students will be able to describe the general properties of each state of matter. |

1. **Academic Language:** In a bulleted list, provide thespecialized content terms/vocabulary that students will need to know (*erosion, democracy, perimeter, onomatopoeia*). Define the specialized vocabulary in terms children in your grade can understand. Also list the general academic language (*compare, contrast, analyze, explain, synthesize,* etc.) that students need to understand in order to complete your academic tasks.

* Matter-any substance-solid, liquid or gas-that takes up space
* Solid-matter that holds its own shape
* Liquid-matter that flows and takes the shape of the container it is in
* Gas-matter that spreads to fill the space it is in
* Kinetic energy-energy an object has due to its motion or movement
* Molecule- two or more atoms held together by chemical bonds

1. **Academic Demand:** *Explain by each 5E phase how your lesson is designed to help children develop or reinforce their understanding of the required academic language so that they are able to effectively communicate orally and in writing their thinking and knowledge*.

Students will need to know that all things have matter. They will also have to know that states of matter can change shape. Students will need to label pictures as solids, liquids or gases based on what they know about the properties and definitions of each. Students will then have to describe their reasoning by explaining why each is a solid, liquid or gas based on their properties and definitions. Students will then draw what the molecules in each state look like. In their descriptions, they may include information regarding the kinetic energy of the molecules in each state of matter.

1. **Planned Assessments:** *Indicate the types of assessments you plan to utilize in your lesson, and then indicate within your plan where each will be implemented. (Not all types are needed in each lesson.) Be sure assessments are clearly aligned with lesson objectives.*

|  |  |
| --- | --- |
| *Pre-assessment:* | I will use the previous day’s worksheet as a pre-assessment for the final summative test. |
| *Formative Assessment:* | I will formatively assess my students by listening to their responses during the review game. I will review and explain any concepts that seem unclear. |
| *Summative Assessment:* | The post-assessment is included at the end of this lesson. I will use this document to assess student growth, achievement and teaching methods. |

1. **Differentiated Instructional Strategies:** *In a bulleted list, indicate the accommodations you will provide for individuals and subgroups within your class: accelerated learners, English Language Learners*, *as well as learners with special needs. If you do not have students identified as gifted, please list accommodations you could make for students who seem accelerated in science compared to other students. If you do not have students with IEPs or 504 plans, please list accommodations you could make for students who seem to have difficulties organizing, reading/comprehending, reasoning independently, remembering, etc. (Accommodating does* ***not*** *mean simply requiring students to do more or less; it means helping them access content & produce satisfactory work in ways best suited to their academic needs. This might include teacher modeling, utilizing graphic organizers, translation websites, differentiated reading materials, etc.) Do not leave any section blank.*
2. **Gardner’s Multiple Intelligences**

* Visual/spatial – assessment with words and pictures
* Bodily kinesthetic – motions with rap (if time at the end-conclude)
* Musical – states of matter rap (if time at the end-conclude)
* Interpersonal – review game played in two teams
* Intrapersonal – completing the assessment
* Linguistic – verbally explaining answers to review game questions
* Logical/mathematical – logically explaining answers

1. **Accelerated Learners**

* I will challenge my gifted student by asking him to sequence the pictures of ice, water and water vapor and explain how each state of matter can change from one form to another. (ice-water when it melts; water-vapor when it is heated; water-ice when it is cooled)

1. **English Language Learners**

* I will read the test aloud to my one ELL student who needs a reader. I will explain answers to him and allow him to draw pictures or visual representations as well as give verbal responses if necessary; his English is still emerging as he has only been in the US for a few months. I will also allow these students additional time if needed.

1. **Students with Special Needs**

* I will read each test question and available answers to my student on a 504 plan. For my ED student with an IEP, I will allow him necessary breaks. I may also excuse him from the written portion of the exam as writing tends to trigger negative behavior in him. I will also allow both students more time if they need it.

1. **Resources:** *Enter what is needed by each entity for each 5E phase. If a phase is not performed today, state the day it will be or was performed in this learning cycle. If nothing is needed by an entity, type “none” in the cell.*

|  |  |  |  |
| --- | --- | --- | --- |
| 1. **Materials:** | Teacher | Small Groups | Individuals |
| Engagement | Review game- Can Do! Science Game: Matter | none | none |
| Exploration | In previous lessons | In previous lessons | In previous lessons |
| Explanation | In previous lessons | In previous lessons | In previous lessons |
| Extension | In previous lessons | In previous lessons | In previous lessons |
| Evaluation | 20 post-assessment documents | none | 1 post-assessment document |
| 1. **Safety Concerns:** | There are no safety concerns in this lesson. | | |
| 1. **Graphic Organizers:** | The post assessment document contains visual images. Students will draw what the molecules in a solid, liquid and gas look like. This will help students graphically represent and organize their ideas. | | |
| 1. **Cooperative Learning:** | There will be no cooperative learning in this lesson unless students wish to play the review in game in teams. | | |
| 1. **Technology Integration:** | Technology may be integrated at the end of the lesson by playing the matter rap on the SmartBoard. | | |
| 1. **References:** | “Can Do! Science: Matter” Review Game | | |

1. **Daily Procedures**

|  |  |
| --- | --- |
| **ENGAGEMENT PHASE – *Introduce lesson and capture student interest*.** | **Estimated Time:** 10 minutes |
| **Directions**   1. To review for the summative assessment, students will play a review game. We will vote to either play as a class or as two teams. 2. The review game is a game from the CRC called, “Can Do! Science: Matter”. | **Key Questions**  Some of the questions asked will be:  *The molecules in a gas are \_\_\_\_\_ than they are in a liquid or solid.*  *a. closer together*  *b. farther apart*  *c. bigger*  *Which of the following is a solid?*  *a. rain*  *b. puddle*  *c. icicle*  *Which of the following indicates that a substance is a liquid?*  *a. It’s very light.*  *b. It cannot hold its own shape.*  *c. You can see through it.* |
| **EXPLORATION PHASE – *Hands-on/minds-on student-centered inquiry activity*.** | **Estimated Time:** Not present in this unit |
| **Directions** | **Key Questions** |
| **EXPLANATION PHASE – *Discuss exploration results, define concepts and explain concepts*.** | **Estimated Time:** Not present in this unit |
| **Directions** | **Key Questions** |
| **EXTENSION PHASE – *Apply concepts in hands-on/minds-on student-centered activity*.** | **Estimated Time:** Not present in this lesson |
| **Directions** | **Key Questions** |
| **EVALUATION PHASE – *Describe how and in which 5E phase each objective will be assessed. There should be some type of informal and/or formal assessment in each Exploration, Explanation, and Extension phase*.** | **Estimated Time:** 20 minutes |
| All objectives will be summatively assessed during the evaluation phase. To conduct this assessment, each students will get a test and will be instructed to put their name on the top. I will then read the directions and explain each part of the test to the students. I will then instruct them to work independently and do their best. I will call my student with a 504 and my ELL student to the kidney table. I will read the directions to them and provide necessary prompting to my ELL student. Once students are done, I will collect and grade their assessment. I will reflect on the results in my lesson reflection. | |
| **CLOSURE – *Finish lesson by helping students think about what was important today*.** | **Estimated Time:** 2 minutes |
| To conclude the lesson, students will sing along to the matter rap video on the SmartBoard. This will reinforce vocabulary and key ideas about states of matter. If time allows, we will present the rap to the class in 3 groups of 6/7 students. | |

1. **Enrichment**

To enrich learning, we could next discover how to measure solids and liquids.

1. **Insert handouts for Day 5 here.**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The following questions are to help me understand how much you know. This test will not be for a grade; just do your best!

**True or False**

For each question below, clearly mark what you believe to be the best answer.

1. Everything in the world is made up of matter. **True False**
2. Solids, liquids and gases can change their state (solids can turn into liquids, liquids can turn into gases, liquids can turn into solids).

**True False**

**Matching**

Draw a line to match each object with its state of matter.

3. Solid [](http://www.google.com/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=2Cc4uNZ8utyNPM&tbnid=YvYNI5mhSIW_8M:&ved=0CAUQjRw&url=http://www.fda.gov/Food/ResourcesForYou/Consumers/ucm197586.htm&ei=Y4CHUrLbHaWEyAHLuoDIDQ&psig=AFQjCNFjrPyphgVmY2y8sBhycY5X3Q2l1g&ust=1384698288466535) (ice)

4. Liquid  (water vapor)

5. Gas  (water)

**Short Answer**

Using your answers from above, explain how you knew each object’s state of matter. Then draw a picture to best represent the molecules in each object.

6. Ice is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_because

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The molecules inside ice look like…

7. Water vapor is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The molecules in water vapor look like…

8. Water is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The molecules in water look like…

