

Lesson 1

Lesson Title: Dancing Raisins

Grade Level: 5th

State Core Standards:

Standard 1

Students will understand that chemical and physical changes occur in matter.

Objective 2

Evaluate evidence that indicates a physical change has occurred.

1 Identify the physical properties of matter (e.g., hard, soft, solid, liquid, gas).

Lesson Purpose: I want to demonstrate how buoyancy and density are linked.

Vocabulary Focus:

Buoyancy

Density

Physical Properties

Materials:

Club Soda (2 2L bottles)

Raisins (1 pkg.)

Clear Container (1 for each group of students)

Scales (1 for each group of students)

Empty cup (1 for each group)

Dancing Raisins Worksheet (1 for each student)

Lesson Time: 20-30mins

B. Instructional Procedures.

Engage and Launch: 5 mins

Start off the lesson by telling a story that the kids can relate to and wonder about:

Last weekend I was at the swimming pool and I discovered the most interesting thing!!! As I was swimming I would sometimes be floating on top of the water and other times I would sink beneath the water. So I stopped swimming and found that I rose when I breathed in and sunk when I breathed

out!!!! (Some of the kids might be nodding or laughing depending on the group) I also found out that when my stomach was out of the water it didn't have the same effect.

I will then ask the students why they think this is and get some suggestions.

- 1. Why does this happen?**
2. How come it doesn't happen in a bathtub?
3. Do you think it works the same for everybody? Children? Adults?

Write down a few of the kid's suggestions on the board. If one of the kids bring up density or buoyancy make all of the students aware that these words were said but don't explain what these terms mean.

Teacher Role	Asks questions; Assesses prior knowledge; Provides information needed for Explore phase
Student Role	Gains interest; Calls up prior knowledge; Develops a need to know

Explore: 10 min.

Next I will gather the materials up front and give each group of students a set of items:

Empty cup
Clear container
Raisins
Scale

I will explain what each is and have the students tell me what phase of matter each object is. Ex. Club soda is a liquid and a gas. Raisins are a solid. Etc.

I will then have each group measure in grams how much each item weighs on their Dancing Raisins Worksheet. After the students have measured their empty cup have them fill it with club soda and then measure it again.

Next I will have them drop in a few raisins and have them record what happened and answer the rest of the questions on their worksheet.

Teacher Role	Makes open suggestions; Questions and probes; Provides feedback; Assesses understanding and processes
Student Role	Explores resources and materials; Hypothesizes and predicts; Records observations and ideas;

Explain and summarize: 5 minutes

Next I will go over the student's answers on their worksheet and have a discussion about what happened with the raisins.

When the raisins are first introduced into the club soda, they are denser than the liquid. As bubbles collect in the raisins crevices, the combined raisin and bubbles are less dense and more buoyant. When the raisins reach the surface, the bubbles pop, leaving the raisin with out bubbles thus becoming denser than water so it sinks and starts the process over.

Teacher Role	Asks for clarification and evidence from students; Enhances or clarifies student explanations; uses students' experiences as a basis for explaining new concepts; provides new vocabulary; evaluates student explanations.
Student Role	Clarifies understandings discovered; Shares understandings for feedback; Forms generalizations; Seeks new explanations

Elaborate and extend: 5 mins

1. Depending on the time you can have the students collect items around the class so see if the same thing happens with the new items: pencils, erasers etc.
2. Before the students put the items in the soda have them record the weight and what they think will happen to the items when they are put in the soda. There is an area for this at the bottom of the worksheet.

Teacher Role	Asks questions; Poses new problems and issues;
Student Role	Applies new knowledge by performing related tasks; Asks questions;

Evaluate: I will be able to make formative assessments by collecting the students worksheets as well as from the questions and responses I get from walking around the class.

Teacher Role	Observe and assess students; Asks open-ended questions;
Student Role	Demonstrate an understanding of a skill or concepts; Evaluates his/her own progress and knowledge; Answers open-ended questions by using observations, evidence, and previously accepted explanations

Adaptations for Special Needs:

Abram and Charlie constantly need refocusing so that they can get the information they need. They are also paired in groups with friends who will help keep them on task in activities.

Rayanna and Leila sometimes need a quiet space to focus on her work. She is allowed to go to the conference room when we are working on homework.

Hunter constantly talks with friends and gets distracted from doing his work. If this happens have him go to the back table.

Name: _____

Dancing Raisins Worksheet

1. Measure in grams the following items

Item	Weight (in grams)
Empty cup	
Clear container	
Cup with soda	
Raisins	

2. What happened to the raisins when you dropped them in the soda?

3. Why do you think this is? Give evidence to support your reasoning

4. Give definitions for the following

Buoyancy:

Density:

Mass:

5. Find some other objects in the room that you would like to test and measure and label them on the table

Item	Weight	Do you think it will sink or float?

Science Unit Lesson 2

A. Information Components

Lesson Title: The Conservation of matter

Grade Level: 5th

State Core Standards:

Standard 1

Students will understand that chemical and physical changes occur in matter.

Objective 1

- a. Compare the total weight of an object to the weight of its individual parts after being disassembled.
- b. Compare the weight of a specified quantity of matter before and after it undergoes melting or freezing.

Objective 2

- c. Evaluate evidence that indicates a physical change has occurred.

Specific Lesson Objective:

What happens to the weight of matter when it is broken?
Matter cannot be created nor destroyed by ordinary means.

Vocabulary Focus:

Matter

The Law of conservation of matter

Weight

Mass

Materials:

Bill Nye Handout

The sum of its parts handout

Science Reading handout

Scale (1 for each group)

Connector cubes (25 per group)

Oranges (one for each student)

Lesson Time:

B. Instructional Procedures.

Engage and Launch: 25 minutes

To get the kids engaged and to give them the proper info for the experiment, I'm going to start them off by watching a Bill Nye video on the phases of Matter. They will have a worksheet that they need to fill out during the movie. After the movie I will go over the questions as a class and help them fill out any answers they missed. I will also give extra information if they don't understand what is going on in the video.

Teacher Role	Asks questions; Assesses prior knowledge; Provides information needed for Explore phase
Student Role	Gains interest; Calls up prior knowledge; Develops a need to know

Explore: 20 minutes

1 Next I will pass out scales and cubes to each table and have them work on the sum of its parts experiment. I will give them time to work on it and walk around to give formative assessments on their responses and help answer questions. Once every group is finish I will ask questions to see what happened in their experiments.

1. What does one cube weigh?
2. Does it matter if you don't cancel out the weight of the container
3. Is there a way to figure out the weight of any given number of cubes without weighing all of them?

Teacher Role	Makes open suggestions; Questions and probes; Provides feedback; Assesses understanding and processes
Student Role	Explores resources and materials; Hypothesizes and predicts; Records observations and ideas;

Elaborate and extend: 5 mins

3. I will then pass out oranges and ask them if this will be the same as the cubes?
4. The students will then peel the orange and see if the orange weighs the same before and after.
5. Some students will get the same weight others will be different and I'll ask why they think that is? Where did the mass go? (Because of juice and oil in the peel)

Teacher Role	Asks questions; Poses new problems and issues;
Student Role	Applies new knowledge by performing related tasks; Asks questions;

Explain and summarize: 15 minutes

1. Next I will bring up the science packet up on the board and go through it with them. I will go through the information with them highlighting the key concepts. As we go through the information there are a few questions I will have the kids stop and think and then answer on their own packets and then ask these questions as a class and get their input. I will continue until page 2 after they finish and have gone over the “Think Like a Scientist” questions.

Teacher Role	Asks for clarification and evidence from students; Enhances or clarifies student explanations; uses students’ experiences as a basis for explaining new concepts; provides new vocabulary; evaluates student explanations.
Student Role	Clarifies understandings discovered; Shares understandings for feedback; Forms generalizations; Seeks new explanations

Evaluate:

Formative: I will have formative assessments from my open-ended questions during the lab and assignments. I will also have their answers in their science packet and experiment handouts.

Summative: There is an end of unit test the kids will take as well as several review tests to see where the students are at and what needs to be retaught.

Teacher Role	Observe and assess students; Asks open-ended questions;
Student Role	Demonstrate an understanding of a skill or concepts; Evaluates his/her own progress and knowledge; Answers open-ended questions by using observations, evidence, and previously accepted explanations

Adaptations for Special Needs:

Abram and Charlie constantly need refocusing so that they can get the information they need. They are also paired in groups with friends who will help keep them on task in activities.

Rayanna and Leila sometimes need a quiet space to focus on her work. She is allowed to go to the conference room when we are working on homework.

Hunter constantly talks with friends and gets distracted from doing his work. If this happens have him go to the back table.

Name _____ Date _____

Bill Nye- Phases of Matter Questions

2 Everything in the universe is made of _____. Matter is stuff, everything you can touch. Matter is made of atoms and molecules (which are atoms stuck together). Matter comes in 3 ways called the Phases of Matter. The 3 phases of matter are: _____, _____, and _____.

2 The only difference between solids, liquids, and gases is _____. Getting matter to change phase takes _____.

- To turn liquid water into a gas, you need to heat it with _____ from the burner. The molecules get more energy, which causes them to move faster and move apart.

3 To turn liquid into a solid, you need to take _____ away. This can be done with a freezer. Where does the heat (or energy), go that was in the freezer? (Why do you feel heat coming out of your refrigerator?)

4 Changing a solid to a liquid to a gas always requires the same thing-

5 Liquid nitrogen can change from a liquid to a gas without the help of a burner because it is so _____, minus 196 degrees, that the energy in the room, (the warmth of the room), is able to make it boil. (Figure this out: A comfortable room temperature is 72 degrees. How much warmer than liquid nitrogen is that? _____) The heat from the room is so much warmer than the liquid nitrogen that it makes the molecules move faster.

7 What percentage of the air we breathe is made of nitrogen?

8 What happens when molecules slow down?

What happens when molecules speed up?

9 Why does the hot, liquid chocolate turn to a solid when it is poured onto the ice cream?

10 In a _____, the molecules are moving slowly and are packed close together. In a _____, the molecules are moving faster, are farther apart, and are able to flow. In a _____, the molecules are moving very fast and are very far apart.

When matter is in the _____ phase, it takes the shape of its container. When matter is in the _____ phase, it takes the shape of its container. When matter is in the _____ phase, it holds its shape.

Name _____ Date _____

It's the Law – Sum of the Parts

Nature's laws are different the government's laws. Nature's laws are scientific ideas that have proven to be true over and over again. There is a law of science that applies to matter. It is called "The Law of Conservation of Matter".

This law says that: **Matter cannot be created or destroyed by ordinary means.**

Matter cannot be created nor destroyed but it can certainly be changed.

Question: What happens to the weight of matter when it is broken?

Materials: scale, 25 Link Cubes

Procedure:

- 3 Measure the mass in grams of one cube. Record your measurement in the data table.
- 3 Take all 25 cubes and weigh them on the scale.
 - Place the cubes in a container
 - Weigh the container
 - Weigh the container with the cubes
 - Subtract the weight of the container from the total weight
- 4 Now link all the cubes together into one solid block and measure the mass in grams.
- 5 Reassemble the blocks into 2 different shapes, and then measure their total mass in grams.
- 6 What conclusion can you make about the mass of all the simple pieces compared to the mass of the pile, or the mass of the block, or the mass of the 2 shapes?

Data / Results

Number of Cubes	Mass in grams
One	
Predict the mass of all the cubes you are using	
Weight of container	
Weight of container with all 25 cubes	
Weight of cubes minus weight of container	
Weight of cubes put into a rectangular/block shape	
Weight of cubes put into 2 shapes	

Conclusion:

Write an equation describing the relationship between the weight of the sum of the parts (all 25 cubes) and the weight of the whole (the block). _____

If you weigh an apple, then cut it into sections and weigh ALL the sections will the weight change?

Lesson 3

Lesson Title: Density Columns

Grade Level: 5th

State Core Standards:

Standard 1

Students will understand that chemical and physical changes occur in matter.

Objective 1

Describe that matter is neither created nor destroyed even though it may undergo change.

1. Compare the total weight of an object to the weight of its individual parts after being disassembled.

Objective 2

Evaluate evidence that indicates a physical change has occurred.

1. Identify the physical properties of matter (e.g., hard, soft, solid, liquid, gas).

Specific Lesson Objective: I want my students to be able to identify the physical differences in liquids

Lesson Purpose: What is density and how does this physical property affect the stages of matter.

Vocabulary Focus:

Density

Volume

Buoyancy

Materials:

6 Tall cylindrical Beakers

6 Scales

30 4oz cups

300 mL Water, Rubbing Alcohol, Corn Syrup, Glycerin (Dish Soap) and Vegetable Oil

Food coloring

3 Clear boxes

50 foam balls

Lesson Time:

B. Instructional Procedures.

Engage and Launch:

I will start the lesson by asking the students to review what we have already learned.

1. What are the 3 phases of matter?
2. What is solubility?
3. Does breaking an object effect how much mass an object has?

I will review with the kids to see how much information has been retained as well as fill in any gaps that will be necessary for the experiment we will be doing today. I will then inform them that today we will be learning about another property of matter: Density

Next I will ask if any kids know what density is and can explain it. I will take few suggestions and see what they know. I will then start an experiment that gives solid evidence of density. We will be testing the densities of different liquids.

Teacher Role	Asks questions; Assesses prior knowledge; Provides information needed for Explore phase
Student Role	Gains interest; Calls up prior knowledge; Develops a need to know

Explore: 30 min.

I will start off the experiment by passing out the procedure instructions. I will have them read the instructions individually and then have the students go through the experiment step by step.

1. Each group of students needs to collect each of their liquids. There will be trays with the liquids set about the room. Each group needs to measure 50 mL of each and have them be different colors so that they can see the different levels later on.
2. Once each group has the 5 different liquids I will have them predict the order of density of each and write it on their worksheet.
3. Next they will have to find the density of each liquid. First they will measure the weight in grams of each liquid and subtract the weight of the cup. Next they will have to find the density, which is Mass/volume. So they need to divide the weight of their liquids by 50 because there is 50 mL.
4. After they have found the density's they will then get to pour the liquids into the cylinders and see how they layer.

Teacher Role	Makes open suggestions; Questions and probes; Provides feedback; Assesses understanding and processes
Student Role	Explores resources and materials; Hypothesizes and predicts; Records observations and ideas;

Explain and summarize: 10 minutes

- 2. I will then ask the students why they think the liquids layer in that particular way and get a few suggestions.
- 3. I will then grab the clear boxes and foam balls and have a demonstration of how density works in each type of matter:

Solid: I would ask the students about some different types of metals and get some suggestions. I will then show them that in a solid the particles are tightly packed into the solid. I will show this by stuffing a bunch of foam balls into the box. The box will fill up and the balls will be smashed together. Now in solids like Steel and aluminum the balls will still be packed together but steel will have tons of balls smashed into the box, but aluminum will have significantly less.

Gas: I will show the same examples above but with only 1 2 or 3 balls in the box. Oxygen would have 3 balls bouncing around the empty box and helium would have 1 ball bouncing around showing that helium is less dense than oxygen but they are still both gases.

Liquids: Same as above using the most dense and least dense liquids in the experiment.

Teacher Role	Asks for clarification and evidence from students; Enhances or clarifies student explanations; uses students' experiences as a basis for explaining new concepts; provides new vocabulary; evaluates student explanations.
Student Role	Clarifies understandings discovered; Shares understandings for feedback; Forms generalizations; Seeks new explanations

Elaborate and extend: 5 mins

- 6. Finally if there is extra time or if a group of students finish early, I will ask the students to gather a few objects around the room that they would like to test: Erasers, beads, cork, popcorn kernels etc. and have them guess how dense the items are and where they would fall in the density column. They will then drop the items into the density column and observe where the items layer. I will ask questions about their observations and why they made their predictions.

Teacher Role	Asks questions; Poses new problems and issues;
Student Role	Applies new knowledge by performing related tasks; Asks questions;

Evaluate:

I will have formative assessments from my open-ended questions and from the student's worksheets and observations. I will continuously quiz the students on what they have learned in previous lessons.

There will also be a cumulative assessment when the kids take their unit test.

Teacher Role	Observe and assess students; Asks open-ended questions;
Student Role	Demonstrate an understanding of a skill or concepts; Evaluates his/her own progress and knowledge; Answers open-ended questions by using observations, evidence, and previously accepted explanations

Adaptations for Special Needs:

Charlie, Rayanna, Abram, and Abby will need to be monitored to keep them focused and on task. We moved seats around this week so the way the kids work in teams might be different from usual. Hunter has a tendency to daydream so he also needs to be monitored. All of these kids have been placed next to other students who are willing to help them out and keep them on task.

Name: _____

#: _____

Density Columns Worksheet

1. Which liquid do you think is the most dense (will be at the bottom)?
2. Which do you think is the least dense?
3. Record the weight for each liquid and calculate the density
Density = Weight / 50 milliliters

Liquid	Weight (grams)	Density (grams/mL)
Water		
Rubbing Alcohol		
Dish Soap		
Corn Syrup		
Vegetable Oil		

Draw a graduated cylinder to the left and color and label the liquids.

4. Which liquid was the least dense?

5. Which liquid was the most dense?

6. Was your hypothesis correct from beginning to end? (Write a paragraph using complete sentences to explain)

Lesson 4

A. Information Components

Lesson Title: Dissolving Salt

Grade Level: 5th

State Core Standards:

Standard 1

Students will understand that chemical and physical changes occur in matter.

Objective 1

Describe that matter is neither created nor destroyed even though it may undergo change.

C. Investigate the results of the combined weights of a liquid and a solid after the solid has been dissolved and then recovered from the liquid (e.g., salt dissolved in water then water evaporated).

Objective 2

Evaluate evidence that indicates a physical change has occurred.

4 Identify the physical properties of matter (e.g., hard, soft, solid, liquid, gas).

5 Compare changes in substances that indicate a physical change has occurred.

6 Describe the appearance of a substance before and after a physical change.

Lesson Purpose: Students need to explain and prove that if a substance such as salt is dissolved it is not destroyed and maintains its mass if the liquid is dissolved.

Vocabulary Focus:

Dissolve

Solute

Solvent

Materials:

Cups (1 for each group of students)

Salt (1 package)

Water

Scale (1 for each group)

Lesson Time: 35 min

B. Instructional Procedure

Engage and Launch:

Begin the class by review what we have learned about matter:

1. Can it be destroyed?
2. What are 3 main types of matter and their features
 - a. Solids: maintain their shape in a container, molecules are tightly packed together.
 - b. Liquids: take the shape of a container, molecules are loosely packed together
 - c. Gas: fill up the shaper of the container, molecules are freely roaming.

I'll then get the classes opinion and ask what happens when a solid like sugar dissolves in water? Does it become a liquid? Gas? Stay solid? How do we know that its still there if we can't see it? Give some time for the students to think pair share and then bring them back together for a class discussion about what they think. I will not give them the answers. I am checking for background knowledge and creating interest.

Teacher Role	Asks questions; Assesses prior knowledge; Provides information needed for Explore phase
Student Role	Gains interest; Calls up prior knowledge; Develops a need to know

Explore:15.

Next I will tell them that we are going to do an experiment that will take a couple of days. I will pass out the experiment worksheet and have them read through the procedure by themselves and then go over it as a class before they begin.

Procedure:

- 4 Measure the weight of the cup and record your data.
 - Pour about 1 tablespoon of salt into a clear plastic cup. Place the cup on a scale and find the weight of the cup and the salt. Record the weight.
- 5 Fill the cup about 1" cups of water and stir until all the salt has dissolved.
- 6 Using a permanent marker draw a line at the level of the water and place the cup where it can remain undisturbed while the water evaporates.
- 7 Make a prediction (hypothesis: If... then ...): What will happen to the salt when the water evaporates?
- 8 Check the cup every 3 days. If you notice any changes, record your observations.
- 9 When the water has completely evaporated. Weigh the cup and the material in the cup. Record the weight.
- 10 Discuss your findings.

After the students have finished writing their predictions have the groups talk about each of their ideas. Then go over each item in the experiment asking what state of matter each object is and how we know this: water, salt, scale.

Teacher Role	Makes open suggestions; Questions and probes; Provides feedback; Assesses understanding and processes
Student Role	Explores resources and materials; Hypothesizes and predicts; Records observations and ideas;

Explain and summarize: 5 minutes

After the students have filled out the worksheet after the next couple of days go over it with them. Have them state whether their hypotheses were correct or not. The salt crystalized in the cup because after the water was taken out the salt was the only thing that could remain. Ask if they can think of any other instances that they have seen this happen. They might bring up rock candy, stalactites and stalagmites etc. Explain for each how this happens.

Teacher Role	Asks for clarification and evidence from students; Enhances or clarifies student explanations; uses students' experiences as a basis for explaining new concepts; provides new vocabulary; evaluates student explanations.
Student Role	Clarifies understandings discovered; Shares understandings for feedback; Forms generalizations; Seeks new explanations

Elaborate and extend: 5-10 mins

- Next have them take out their science journals and come up with two other liquids that have things dissolved in them. Soda, cool aid, caramel... anything they can think of and have them try this same experiment at home. Will the same thing happen? If there are multiple things dissolved in the liquid will they separate?

Teacher Role	Asks questions; Poses new problems and issues;
Student Role	Applies new knowledge by performing related tasks; Asks questions;

Evaluate: I will be able to get formative assessment for hearing the students' answers, their worksheets and going through their science journal entries.

Teacher Role	Observe and assess students; Asks open-ended questions;
Student Role	Demonstrate an understanding of a skill or concepts; Evaluates his/her own progress and knowledge; Answers open-ended

	questions by using observations, evidence, and previously accepted explanations
--	---

Adaptations for Special Needs:

Charlie, Rayanna, Abram, and Abby will need to be monitored to keep them focused and on task. We moved seats around this week so they way the kids work in teams might be different from usual. Hunter has a tendency to daydream so he also needs to be monitored. All of these kids have been place next to other students who are willing to help them out and keep them on task.

Name _____

Date _____

Investigation: Dissolving Salt

Learning goals:

- 7 Describe that matter is neither created nor destroyed even though it may undergo change.**
- 8 Identify the investigation as a physical or chemical change.**
- 9 Evaluate evidence that indicates a physical or chemical change has occurred.**

Procedure:

- 5 Measure the weight of the cup and record your data.
 - Pour about 1 tablespoon of salt into a clear plastic cup. Place the cup on a scale and find the weight of the cup and the salt. Record the weight.
- 6 Fill the cup about 1" cups of water and stir until all the salt has dissolved.
- 7 Using a permanent marker draw a line at the level of the water and place the cup where it can remain undisturbed while the water evaporates.
- 8 Make a prediction (hypothesis: If... then ...): What will happen to the salt when the water evaporates?
- 9 Check the cup every 3 days. If you notice any changes, record your observations.
- 10 When the water has completely evaporated. Weigh the cup and the material in the cup. Record the weight.
- 11 Discuss your findings.

Observation:

	Physical properties
Cup	
Cup of Water	
Salt	

Object weight _____

Write a prediction of what you think will happen to the dissolved salt when the water evaporates.

Weight of cup and salt	
Weight of cup and salt after water has evaporated	

Difference between weights before and after evaporation	
---	--

Record your observations:

	Weight	Observation
Observation 1		
Observation 2		
Observation 3		
Observation 4		
Observation 5		

Was your hypothesis prediction correct? (Be sure to use complete sentences to write your response.)

Lesson 5

Lesson Title: Root Beer Floats

Grade Level: 5th

State Core Standards:

Standard 1

Students will understand that chemical and physical changes occur in matter.

Objective 2

Evaluate evidence that indicates a physical change has occurred.

- a. Identify the physical properties of matter (e.g., hard, soft, solid, liquid, gas).
- b. Compare changes in substances that indicate a physical change has occurred.
- c. Describe the appearance of a substance before and after a physical change.

Lesson Purpose: Students will identify the different properties of matter in this demo. They will also analyze the physical changes that happen while we make the root beer.

Vocabulary Focus:

Matter

Sublimation

Properties

Carbonation

Materials:

Water (1 gallon)

Sugar (2 ½ cups)

Root Beer Extract (2 tbsp.)

Dry Ice (1 lb.)

Cooler

Vanilla Ice Cream

Small cups

Root Beer Handout

Lesson Time: 25-30min

B. Instructional Procedures.

Engage and Launch:

I will begin the lesson by telling the kids we will be making root beer floats. This will generate a lot excitement. This activity is a demonstration so the kids will be filling out a worksheet while we go through the process of making the root beer.

Ask the students if they have ever made root beer before. A lot of them will have already at family parties. Remind them that like when you made it before the students need to be careful and pay attention. We will be using dry ice today and it can burn you if you touch it without using gloves. So if they see a piece of it where it's not supposed to be, they need to inform the teacher.

Teacher Role	Asks questions; Assesses prior knowledge; Provides information needed for Explore phase
Student Role	Gains interest; Calls up prior knowledge; Develops a need to know

Explore and Explain and Summarize: 15 min.

1. Hand out the worksheet to each student.
2. We will start off with #1 on the worksheet and review the 3 common states of matter: solid, liquid, gas. They may mention plasma and this is a substance that gets so hot that it has an electrical charge. An example of this would be lightning.
3. Begin making the root beer. You can call students up to come and add the ingredients or do it yourself depending on the climate of the classroom.

Procedure:

1. Pour cold water in the cooler.
2. Add sugar and root beer extract. Mix thoroughly. Add dry ice to the mixture and stir frequently to prevent the dry ice from clumping to the bottom of the container.
3. Continue to stir until the ice has dissolved
4. Do not cover the container while making the root beer because pressure will build up and the container may explode.
5. Pour root beer into individual cups and add ice cream to make it a root beer float

As you add each ingredient to the mixture talk with the students about what phase of matter each is in: water (liquid) extract (liquid) Cooler (solid) Sugar (solid)*** this one is key because it becomes a liquid when it dissolves. Help them notice that this is a physical change and ask if it can be undone like with what we did with our salt experiment.

Next when you add the dry ice (a solid) it will immediately turn to a gas. Ask the students what is happening is it becoming a liquid? Gas? Stay a solid?

Have them answer #3 on the worksheet. When you add the dry ice, it sublimates (changes directly from a solid to a gas) and provides the carbonation for the root beer. This is a physical change. It can be undone if we had the equipment to collect the gas and put enough pressure to make it solid again. It is not a chemical change because not new substance is being created. The hard gas is warming up and changing its phase of matter.

Finally when the root beer is made ask the students if all the matter that we added is still here? Most of it is but some of the carbon gas has escaped into the room. This is called the Law of Conservation of Mass, which states that matter cannot be created or destroyed under normal means.

While they are enjoying the root beer floats, have them answer #6 individually. After they have had enough time go over the answers as a class.

Teacher Role	Makes open suggestions; Questions and probes; Provides feedback; Assesses understanding and processes
Student Role	Explores resources and materials; Hypothesizes and predicts; Records observations and ideas;

Teacher Role	Asks for clarification and evidence from students; Enhances or clarifies student explanations; uses students' experiences as a basis for explaining new concepts; provides new vocabulary; evaluates student explanations.
Student Role	Clarifies understandings discovered; Shares understandings for feedback; Forms generalizations; Seeks new explanations

Elaborate and extend: 5 mins

Show the students again what happens when you add some dry ice to water. They will see that the gas bubbles over the container and falls to the ground. Ask them why they think this is happening. Why does the gas sink to the ground and not float up in the air? We learned that gasses take the form of the container, in this case the room, so why is it acting like a liquid and sinking to the floor. Have the students write their thoughts in their journals and ways that we might test their hypothesis. I will look through their journals and see if there are any great ideas for testing with dry ice.

Teacher Role	Asks questions; Poses new problems and issues;
Student Role	Applies new knowledge by performing related tasks; Asks

	questions;
--	------------

Evaluate:

I will get formative assessments by getting their answers during class and seeing their responses on their worksheets. I will also look through their journals and see if any good experiments can be done through their ideas.

Teacher Role	Observe and assess students; Asks open-ended questions;
Student Role	Demonstrate an understanding of a skill or concepts; Evaluates his/her own progress and knowledge; Answers open-ended questions by using observations, evidence, and previously accepted explanations

Down the Hatch With Root beer

Name _____ # _____

1. What are the three common states of matter?

2. Which part of the root beer does each substance represent?

3. When the dry ice goes straight from a solid to a gas this process is called _____.

4. This type of change is called a

It is not a _____ because

5. Is all of the original mass still present?

_____ This called the Law of

_____ which states

6. What are physical properties you can observe with the root beer? What physical changes happened while we made it?

5. What does it mean for something to be soluble? Give some examples.
6. Objects with more density than water will:
- A) Continuously rise and fall in water
 - B) Float in water
 - C) Cause water to freeze
 - D) Sink in Water
7. The particles found in Solids are close together.
- A) True
 - B) False
8. Anthony's science teacher drops some glass funnels on the floor. The funnels break into several pieces. Which property of the glass will remain the same?
- A) Size
 - B) Mass
 - C) Shape
 - D) Density
9. Which of the following is an example of a physical change?
- A) An apple turning brown when exposed to air.
 - B) Fireworks exploding in bright flashes of color.
 - C) Spoiled food smelling bad in a trashcan
 - D) Large rocks getting crushed to be used as gravel.

17) When I work, I like to...(circle all that apply to you)

- a. Work alone
- b. Work with a partner
- c. Work in a small group with 2-3 other students

17) Circle the things you like to do:

Read

Write

Act

Draw

Present

18) How do you like to learn? Circle all that apply.

a. I remember best if I hear something.

b. I learn best when the information is presented in words

c. I like to read about something rather than hear about it.

d. I remember best by writing things down or drawing pictures.

e. I remember best if I can make something that tells about what I am learning.

19) How do you like to show what you've learned? Circle all that apply.

a. I like to act things out to show what I have learned.

b. I like to show what I've learned by making a power point or poster presentation about it. c. I like to show what I've learned by talking about it

d. I like to show what I've learned by writing about it.

Assesment Data chart

Pre-Assesment	Post Assesment
1. 3/15	14/15
2. 3/15	14/15
3. 4/15	13/15
4. 5/15	14/15
5. 4/15	
6. 4/15	
7. 4/15	14/15
8. 7/15	14/15
9. 11/15	11/15
10. 11/15	15/15
11. 4/15	14/15
12. 7/15	9/15
13. 5/15	13/15
14. 6/15	13/15
15. 3/15	13/15
16.	14/15
17.	
18. 9/15	
19. 0/15	
20. 4/15	14/15
21. 4/15	13/15
22. 4/15	12/15
23. 4/15	11/15
24. 6/15	13/15
25. 5/15	
26.	
27.	
28.	14/15
29. 10/15	
30. 3/15	10/15

