

Unit Plan:

Mixtures and Solutions

Fifth Grade

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SPE 304

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Overall Objective/Introduction

This unit on the topic of mixtures and solutions will introduce our students to the different concepts and characteristics of mixtures and solutions. By the end of this unit, students will be able to differentiate mixtures and solutions and dictate whether they are homogeneous or heterogeneous. Learning about the makeup of mixtures and solutions provides us with knowledge about how things go together and how they can be taken apart. Throughout this unit, our students will explore and see firsthand how mixtures and solutions are relevant in real life.

The activities that we included in this unit will involve the use of several different modalities that creates interaction amongst the students. Cooperation is important for our class because the room is rather small. In order to make the best use of our space, we will use small groups for most activities. Using small groups will also help with not overwhelming our students with the amount of work they have to do, as well as keeping their attentions by only having them focus on one thing when moving from station to station. The levels of the students in the class is varied greatly. The students range from advanced proficient to below average. Some students are classified, so cooperative and group work is essential for the success of the class. These students come from middle to high class families. Socioeconomic status does not affect the classroom dynamics much since most of the students come from families of similar socioeconomic status.

This unit will be taught across subject areas: during social studies the students will explore how different mixtures and solutions are used in distinct ways around the world in various regions. During math we will have the students sort different components of trail mix to

find the percentages of each component, for example; the mix is 10% m&ms and 20% peanuts. During reading we will give vocabulary to the students pertaining to mixtures and solutions that they will use on their game boards. During this time, the students will have to discuss the differences between mixtures and solutions. We will have a special activity that is called a rainbow in a bottle. This will show the students which liquids mix together to make solutions or stay separated. There will be an activity where students create game boards in art and science where the students will research mixtures or solutions to create ten questions they can ask during their game. We will listen to a song that will help the students to remember the characteristics and differences of separating mixtures and solutions. This song will be played each morning and will help the information better stay fresh in the students memories. This unit is a scientific topic but will be taught throughout all content areas for the students to make connections and have real life examples of the materials being taught.

Rationale

We will teach this unit as part of the fifth grade science curriculum. This unit is important to teach because it is an introduction to Chemistry which will start to be taught in middle school. Mixtures and solutions are part of everyday life which makes the topic relatable and obtainable to keep student engagement. The activities pertaining to mixtures and solutions will not be solely done during science class, but instead the unit will also be incorporated into social studies, art, math, vocabulary, and music. In order to deepen the students' understanding of mixtures and solutions and how they are used in everyday life, it is important to teach the concepts across content areas.

We will begin this unit with an introductory and exploratory activity using trail mix, which represents a homogeneous and heterogeneous mixture. This activity will give the students a real life example of a mixture and how it differs from a solution before having any knowledge on what a mixture or solution is. Doing this activity before instruction on mixtures and solutions will help the students to make connections and relate to the lessons on mixtures and solutions after the activity is complete. These activities also link science and math content by using ratios while determining characteristics about mixtures.

Following the introductory activities and lessons, we will begin incorporating mixtures and solutions into the classroom everyday across content areas. After the introductory activity has been completed, there will be a lesson in social studies that explores how mixtures and solutions are used all around the world. The students will research an item from their own culture and explain if it is a mixture or a solution and why. This will link the concept of mixtures and solutions to their own life, making the material more meaningful to the students. The next lesson teaches the concept of separating mixtures and solutions through a song called the

Mixtures Separating Song. This “remix” explains the different processes of separating mixtures and solutions using scientific vocabulary. Here students will be able to hear the vocabulary used in context before being taught the different processes. The following day we will have our “special activity” during the science period to deepen the understanding of separating mixtures and solutions. This activity will be called “Rainbow in a Bottle” and will be a group activity to incorporate cooperation along with making connections to previous lessons. In closure of this unit, the students will create a game board that is a trivia game using vocabulary for mixtures and solutions, creating this will not only let the students be creative with their learning, but it will also reinforce the materials taught throughout the unit. The day before the end of the unit, the students will be able to play each other's game boards as the closing to the unit. At the end of the unit there will also be a unit project as a long term formative assessment that will measure the understanding the students have for mixtures and solutions after all the lessons are completed.

The standards that our unit is based off of are from the Next Generation Science Standards, Common Core Standards, and CEC Standards.

5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

5-PS1-3. Make observations and measurements to identify materials based on their properties.

5-PS1-2. Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.

RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

Adaptations

In our class of 25 students, there are 3 students with classifications and IEPs. All of these students are mainstreamed in our classroom for every subject except reading and writing, where they are pulled out into a self-contained classroom. During science, social studies, and math there are two paraprofessionals in the classroom aiding to the students with special needs and those who are struggling with the content being taught. We differentiated this unit to meet the needs of all our students with and without classifications.

George is a ten year old boy with aspergers, he has above average intelligence in subjects such as math and science. George has difficulties working with his peers and does not like help from the paraprofessionals. George thrives when given independent work and enjoys figuring concepts out on his own. Current adaptations that George has are that he is able to work independently at times, he is able to use his Chromebook during all lessons and activities, and he has extended time on assignments. George will be able to use all of these adaptations during the unit along with other specific adaptations needed for specific lessons.

Ruthie is a ten year old girl with developmental delays and autism. Ruthie loves socializing with her friends but does not communicate well with her teacher or paraprofessionals. Ruthie loves to read and does so at an advanced level, but is delayed in math, science, and writing. Ruthie has trouble asking for help and cannot convey her confusion to others. Ruthie often forgets necessary materials for class such as homework and books. A specific adaptation for Ruthie that we will incorporate into this unit is the use of a document camera to project work onto the SmartBoard™ during the activities. Using the document

camera will give Ruthie a visual of what she is supposed to do, so that if she has questions she can refer back to the SmartBoard™ for directions on what to do.

Amani is a ten year old boy with ADHD. Amani has difficulty paying attention for long periods of time and often talks to his peers during lessons. Amani's adaptations consist of sitting in the front of the classroom near the teacher to stay focused, and being able to have a stimulus under his desk at all times to be able to touch to stay focused.

In addition to the students with IEPs there is also a student who is not classified but often has ADHD tendencies. He has trouble staying on task and often gets distracted. The material for this individual is below his intellectual ability, and for this reason we believe he may get bored with the material and this is why he becomes distracted. Additional content will be provided to him to challenge his learning and keep him engaged.

Many students in this class have very high intelligence and require more challenging content. These students will be working in a small group pull out during activities where the instruction is too easy for them. These students will put the content into practice instead of sitting through instruction to keep them challenged. We also meet the needs of our entire class by having them work collaboratively in groups and have them share their ideas verbally by turning and talking to a partner throughout the lessons.

Short Term Planning:
Rainbow in a Bottle (Special Activity/ Science)

Rationale: This lesson will be used to develop an understanding of separating mixtures and solutions by funneling dyed liquids of different densities into a water bottle. This will allow the students to observe which liquids will become a solution and which will stay separated.

Standards:

- 5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
- MP.5 Use appropriate tools strategically.

Objectives:

- Before beginning the activity, students will make observations of the liquids and write the observations in their science notebooks with the use of a Bloom's Taxonomy chart with 80% accuracy (100% for group E).
- During the "rainbow in a bottle" activity, students will record their findings in their science notebooks with the use of the "making observations" help sheet with 100% accuracy.
- After completing the activity, students will make inferences for whether their rainbow in a bottle confirmed or refuted their hypotheses with the use of their knowledge on the scientific method with 80% accuracy (100% for group E).

Introduction/Motivation:

- We will prepare the materials needed for this lesson before the lesson begins. Each table will work collaboratively to make one rainbow in a bottle. Each table will receive half a cup of corn syrup, water, alcohol, dish soap, vegetable oil, an empty water bottle, and a funnel. After going over the first half of the presentation, which is a brief overview of the activity, one student from each table will come receive the materials needed for the activity from the back table while we pass around the student handout. This experiment will be mostly independent in the sense that the students will have the freedom to use the materials as they please as long as they follow a few guidelines to ensure that the experiment can be completed.

Development:

- After the introduction, the students will then observe each liquid and its properties and record their observations in their science notebooks. Students will then generate their hypotheses for which liquids will be most dense to least dense. After they create their hypotheses the teachers will come around and help them dye liquids the corresponding colors (most dense-purple to least dense- red).
- The students will need to label the color with the liquid so that they know which liquid is what color.

- Once the liquids are dyed the students will funnel each liquid into the bottle with their most dense liquid first and least dense liquid last. Once complete, the students should observe their end results and compare it to their hypotheses. Was their hypotheses correct? If no, why not? After they complete the activity the students should clean their workstations before moving onto the questions.
- They will then work collaboratively to discuss the questions and their findings from the activity. Once everyone has finished these steps I will finish the presentation, which gives the correct sequence of liquids from most dense to least dense (Corn syrup, dish soap, water, rubbing alcohol, oil)

Materials Needed:

- Corn Syrup
- Water
- Rubbing alcohol
- Dish Soap
- Vegetable Oil
- Clear plastic cups
- Empty water bottles
- Funnels
- Food coloring
- Stirrers

Instructional Strategies:

- Visual (powerpoint, rainbow in a bottle activity, and drawing pictures of their hypotheses and results)
- Auditory (the oral description of the activity)
- Tactile (dying liquids and pouring them into the bottle)

Assessment:

- The students will use their science notebooks to document each step. They will need to draw pictures so that if someone else were to look at their notebook then they would be able to copy the experiment step by step.
- The students will complete the questions provided to them in their science notebooks working collaboratively as a group.

Co-Teaching:

For this activity we will be doing team teaching and one teach one assist. During the presentation and instructional portions of the activity, we will use the strategy of team teaching because we will have practiced the lesson ahead of time and want the students to know that we are equals in the classroom. During the experiment portion of the activity, one will continue to scaffold questions for the students and maintain classroom management while the other goes around the each group to assist them with the activity. There will also be two paraprofessionals in the classroom during this time to aid the students during the activity.

Homework Application:

Since most of the period will be taken up doing the activity, homework for this lesson will be to complete the corresponding questions that were given to them in the beginning of the lesson.

Adaptations:

For this activity, the class will be split up into pre determined groups based on their level of understanding mixtures and solutions thus far. The lower groups will be groups A and B, the middle groups will be C and D, and the higher group will be E. Group E will be asked to each create a bottle and compare each of their bottles to their peers in the same group to make the observations more challenging. George will be in Group E and able to use his Chromebook during the activity to write his responses instead of writing in a science notebook. Amani will be in group C and in charge of getting supplies for his table/dying the liquids to keep him engaged during the activity. Ruthie will be placed in the group A and will also be able to use her Chromebook to record her observations and answers to the questions.

Handout:

Name: _____

Rainbow in a Bottle

Directions: Read each step carefully before you begin.

1. Observe each liquid and record your observations in your science notebook! Keep in mind your helpful observation techniques (I noticed..., It reminds me of..., I observed..., It looks like...)
2. Decide which you think is the most dense and least dense and put them in order from MOST dense to LEAST dense below

- _____
- _____
- _____
- _____
- _____

Use this list to **draw** (in your science notebooks) what your hypothesis is going to look like when the activity is complete!

1. Which ever liquid you predict is the most dense will be dyed purple (1 drop of red, 1drop of blue).
2. The next liquid should be dyed blue (1 drop of blue)
3. The next should be dyed green (1 drop of yellow, 1 drop of blue)
4. The next liquid should be dyed yellow (1 drop of yellow)
5. The last liquid should be dyed red (1 drop of red)
6. Once you have all of your liquids dyed, place your funnel onto your bottle.

7. First you will slowly pour the purple liquid into your bottle making sure that you pour slowly and do not have it run down the sides of the bottle, once the liquid reaches the bottom repeat this step with the blue, green, yellow and red liquids.

Draw what your completed rainbow in the bottle looked like next to the drawing of your hypothesis!

Once you have completed the activity clean up your materials and then answer the questions on the bottom of the sheet.

Note: Before you start the questions, if your bottle is not a "perfect" rainbow, that does not mean that it is wrong, it is just different, as long as you are learning from the activity you are RIGHT! :-)

Please answer the following in your science notebooks!

1. Did your bottle turn out to be a perfect rainbow? Why or why not?
2. Would you change the order of your liquids? Why or why not? and if you would what would the order be?
3. Why don't the liquids blend when they are in the bottle?
4. What happened to liquids that weren't correct in your hypothesis? Why did they move above or below another liquid when placed in the bottle?
5. What do you think would happen if you had added the layers in the reverse order?
6. What is one thing you learned about density from this lesson?

Pictures From the Lesson:



MAKING OBSERVATIONS



□ Do NOT make references to food.



This has the color of perfectly ripened hothouse tomatoes...



Harry, we're not welcome in the lab.

□ Do NOT try to be artsy, poetic, or longwinded. Stay away from the thesaurus.



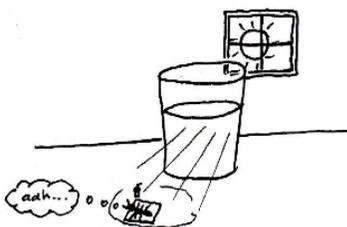
"Oh glorious, glorious, ubiquitous bubbles, Round spheres of beauty soaring heavenward From the midnight dusky blue where they were born!"

□ Use your eyes to determine:

• COLOR

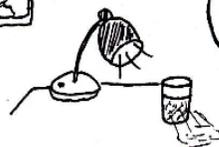


• TRANSPARENCY



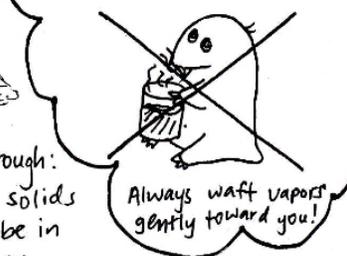
- Light travels all the way through: clear (remember that sol'n's can be clear & colorful), all solids dissolved

I think there's someone outside my cracked window



- Not all the light passes through: translucent, not all the solids are dissolved, may still be in suspension in the solution, cloudy or murky

* Only use your nose when your instructor tells you to!



• SIZE OF SOLIDS



Powders, like cornstarch or baking soda, are difficult to separate into individual particles. They tend to clump up and cling to the sides of containers.



Grains, like sugar or salt, can be separated into individual particles but can still clump up in damp conditions.



Crystals are big enough that you can see their structure with your naked eye.

Trail Mix Mixture Lesson (math)

Rationale:

Doing this activity before instruction on mixtures and solutions will help the students to make connections and relate to the lessons on mixtures and solutions after the activity is complete. These activities also link science and math content by using ratios in the mixture and solution.

Standards:

- 5.NF.B.3: Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
- 5.PS1.3. Make observations and measurements to identify materials based on their properties.
- 5.PS1.4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

Objectives:

- After completing the Trail Mix activity, students will be able to determine whether a substance is a mixture or a solution with 100% accuracy.
- After completing the Trail Mix activity, students will be able to determine whether a substance is homogeneous or heterogeneous with 100% accuracy.
- After completing the Trail Mix activity, students will be able to discuss properties of mixtures and solutions with 80% accuracy.

Materials:

- One cup of trail mix without peanuts per group
- Plastic cups (1 per group)
- Paper towels
- Calculators (1 per group)
- Scale

Introduction/Motivation:

Today we are going to talk about mixtures and solutions. A mixture is made up of two or more kinds of matter that you can usually see mixed with your eyes. A solution is a special type of mixture where you cannot tell the difference between the components, and it cannot be separated easily. What are some other differences between a mixture and solution? Well, mixtures keep their original properties, and solutions do not. In most cases, a solution has different properties than the two or more parts that it is composed of. Who can think of another example of a mixture? Mixtures and solutions that are the same throughout (like milk, Kool-Aid®, etc) are called *homogeneous*. Ones that are not consistent throughout (like Italian salad dressing, oil and water, etc.) are *heterogeneous*. Heterogeneous mixtures and solutions are normally much easier to separate. Today, we are going to be working on an activity with

mixtures and discovering whether or not they are homogeneous or heterogeneous and if they are heterogeneous, what are they made up of?

Development:

- Give each group a small bag of trail mix. Explain to the students that this is a small sample of “soil” that was found outside of a construction site. Most soils are made up of many different small components. As environmental scientists, they need to determine the percent of each material found in the soil sample.
- Have the students observe their trail mix and ask them to classify it as a mixture or a solution.
- Once they have determined that the bag is a mixture, have the students find the mass of each item/part. For this step, the students need to weigh everything.
- Using the worksheet as a guide, have the groups compute the percentage of each part of the trail mix (i.e., What percent of the trail mix is peanuts?) The teacher may need to help explain how to compute percentages depending on students' math level.
- Have students round their percentages to the nearest hundredth. The final percentage should be close to 100%.
- Have the students analyze their soil samples. What percentage of the soil was m&ms, raisins, etc?
- Discuss other everyday products that are mixtures and solutions such as lemonade, cereal, fruit salad, etc.
- Finally, let the students enjoy the snacks as they discuss how a mixture is different from a solution.

Assessment:

Assessment for this lesson will be formative during the lesson by observing students answers to scaffolding questions that will be asked throughout the lesson. The answers to the worksheet will also be used for formative assessment.

HW Application:

For homework, students must bring in a mixture or solution from home to share with the class and explain if it is homogeneous or heterogeneous.

Co-Teaching Approach:

For this activity we will be doing team teaching and one teach one assist. During the presentation and instructional portions of the activity, we will use the strategy of team teaching because we will have practiced the lesson ahead of time and want the students to know that we are equals in the classroom. During the experiment portion of the activity, one will continue to scaffold questions for the students and maintain classroom management while the other goes around the each group to assist them with the activity. There will also be two paraprofessionals in the classroom during this time to aid the students during the activity.

Adaptations:

For this activity, the class will be split up into pre determined groups based on their level of understanding mixtures and solutions thus far. The lower groups will be groups A and B, the middle groups will be C and D, and the higher group will be E. Group E will be asked to each create a bottle and compare each of their bottles to their peers in the same group to make the observations more challenging. Groups A and B will not use the the worksheet, and only use observation techniques. The students will make a list of things they learned, including differences and similarities of mixtures and solutions. George will be in Group E and able to use his Chromebook during the activity to write his responses instead of writing in a science notebook. Amani will be in group C and in charge of getting supplies for his table/dividing the trail mix up into separate components to keep him engaged during the activity. Ruthie will be placed in the group A and will also be able to use her Chromebook to record her observations and answers to the questions.

Handout:

Name: _____

Please answer in your Science Notebooks!

1. What is the total mass of your bag? Be sure to subtract the mass of the Ziploc® bag itself. Record this amount in the “Mass of Mixture” column of the chart.
2. Separate the parts of the items and find the mass of each group. Use the following formula to calculate the percentage for each part of the mixture. Record your data in the chart.

$$\text{Mass} \div \text{Mass of Mixture} \times 100 = \% \text{ of Mixture}$$

3. Check your answer by adding up all the numbers in Column 4. The total should be 100 because all the parts of your mixture combine to make up the whole mixture.

Item	Mass (g)	Mass of Mixture (g)	% of Mixture
TOTAL	=	=	



Mixture: a combination of 2 or more substances that are put together, can be easily separated, and do not make a new substance.

A rectangular box containing a jumble of letters and 'X' marks. The letters are in various colors (red, green, blue, yellow) and are scattered across the box, representing a mixture of different substances.

Examples:
Sand and water
oil and water
Salad
Chex mix

Solution: a mixture of 2 or more substances that can not be easily separated and make s a new substance

A simple line drawing of a glass filled with a liquid. Inside the liquid, there are small dots representing particles. The word "DISSOLVE" is written on the side of the glass.

Examples:
Sugar and water
salt and water
hot chocolate
hand soap

Anchor Chart created during this lesson

Mixtures/Solutions from Around the World (Social Studies)

Rationale:

This lesson will be used to connect mixtures to the students everyday life to further their understanding of this topic. This will allow the students to see the diversity as well as similarities of different solutions and mixtures. Students will be able to identify where specific mixtures or solutions come from.

Standards:

5-PS1-3. Make observations and measurements to identify materials based on their properties.

5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

Objectives:

- Before the activity begins, students will review a powerpoint with slides about different products from around the world and identify the mixtures and solutions based off of what they learned in the powerpoint with 100% accuracy.
- During the mixtures and solutions from around the world activity, students will record what they found and put it into an organized list of mixtures and solutions as well as where they can be found with 90% accuracy.
- After the lesson the students will need to create an ad based on the information that they researched as well as organize this information in a creative way that is easy to understand with 100% accuracy.

Introduction/Motivation:

“In science we have been learning about mixtures and solutions, today for social studies we are going to incorporate what we learned in science to our own cultures.” We will introduce the activity by showing a powerpoint with different products from around the world which the students will identify as mixtures or solutions.

Development:

- First the class will turn their chairs toward the projector to see a powerpoint presentation as an introduction.
- Images of several household cleaning products will be displayed on the board.
- The students will take turns identifying if these products are mixtures or solutions.
- Students will be set up in groups of 3 or 4 students that are mixed intelligence levels.
- In these groups they will be assigned a group of products.
- The students will have to answer the following questions:
 - Is your product a mixture or solution?
 - Is your product homogeneous or heterogeneous?
 - What components make up your product?

- In what other products can these components be found?
- What countries use this product or one similar to it?
- What is this product used for in other countries?
- The students will then have to create an ad for the product used in a country that is not the United States.
- This ad must include:
 - Whether the product is a mixture or solution
 - What is the generic name of the product?
 - What the product used for in that country.
 - If and what is used for in the United States?

To close the lesson, we will have a share out of the groups' ads.

Assessment:

- The students will be assessed on the accuracy of their ad. (accuracy meaning if the information that they discovered while researching is accurate, and if the students present it in a way that is easy to understand)
- Students will need to include all of the answers to the given questions
- Have a neat presentation for their ad, show creativity in their final product, have correct spelling and grammar.

Homework Application:

The homework for this day will be to ask their families for three types of mixtures or solutions from their own culture. Since this classroom is comprised of students from all over the world, this will create an open atmosphere for sharing about their own cultures.

Adaptations for students with special needs:

- This lesson will be differentiated by assigning lower level students common mixtures and solutions to make it easier for them to research them.
- The students with adaptations will be allowed to use their Chromebooks for research and will be allowed extra time (will be able to take home to complete) to complete this assignment.

Co-teaching:

For this activity the co-teaching method of one teach one observe would be best. This is the best fit because one teacher can be teaching the lesson while the other simply observes what stage the students are in on their progress. This will be helpful in determining if the groups prepared fit to the students.

Mixtures Separating Song (Art/Music) Mini Lesson

Rationale:

This song will be used to start lessons pertaining to mixtures and solutions everyday. This is a great song to help the students learn and retain the different ways to separate mixtures and solutions by listening to the song and then applying the content to their work for the day.

Objectives:

- Before the students begin listening to the song, students will come up with a list of what they know about mixtures and solutions with 100% accuracy based on their prior knowledge.
- During the lesson, students will take notes on the parts of the song that they think are the most important and why they are the most important. This will take place with 100% accuracy and recorded in their science journal.
- After the lesson, students will apply their knowledge from the song to define vocabulary given to them with the use of the song lyrics with 90% accuracy.

Standards:

- RI.5.7- Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- W.5.8- Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources
- W.5.9- Draw evidence from literary or informational texts to support analysis, reflection, and research.

Introduction/Motivation:

We will introduce this lesson by asking the students if they have ever heard a song that had to do with science. We will then explain that today we are going to listen and analyse a song that's lyrics were changed to address mixtures and solutions and ways to separate the two.

Development:

- Students will meet at the carpet to listen to the song and read the lyrics on the SmartBoard. They will also be given a printout of the lyrics to refer to.
- Then the class will create a KWL chart to be written on post it notes on an anchor chart pertaining to separating mixtures and solutions.
- The song will be introduced and read over before the video is played.
- When the video is being played the students will write what they believe to be important facts about mixtures and solutions on post it notes.
- The students will turn and share what they learned with their peers.
- After discussing, students will come to the anchor chart to place their post-it notes in the learned section.

- To close, we will ask the students to name some words in the song that they are not familiar with. These words will be assigned to define that night as vocabulary.

Assessment:

- Summative assessment for this lesson will be based off of what the students wrote on their post-it notes for what they learned in the song.
- Participation during the turn in talk will be observed and noted.
- Homework for this lesson will be an indicator for whether or not the students understand the new vocabulary in the song.

Differentiation:

- This lesson will be differentiated by giving the three students with IEPs only three of the vocabulary words to complete for homework (decantation, filtration and evaporation)

Co-Teaching Strategy:

This lesson will be team taught because we feel as though we give two different interpretations of this song. Having two interpretations can help the students to better understand the content of the song incase they do not understand one of our interpretations.

Handout:

<https://www.youtube.com/watch?v=Pr7JU0zslNs>



Straight up, now tell me do you really want to separate a mixture
Oh, oh, oh
Or is it just a solution
(mixtures separate, they separate)

Mixtures Separating
The particles will settle again, decantation
Or is it filtration
Cause liquids pass right through the filter, no solids
Another is heating
Evaporation, distillation
Spinning centrifuging
It's separating a suspension
Well then

Let me see all the substances in mixtures
Broken all in parts two or more
Choose a method on what's in the mixture

And on the physical, the properties
Separating mixtures
Broken into parts of two or more
Choose a method on what's in the mixture
And on the physical, the properties

Place it in jars or settling
Decantation is separating
Insoluble particles and solids sink
Separate from liquids and then we drain
Would you look at that, a filter grabbin' stuff
Pouring mixture in it, trappin particles
Man that residue filter snatchin' it in
Filtration separating liquids from solids
Another method, things dissolved
Evaporation soluble solids from a solvent
Solutions heated till the liquid's a vapor evaporates
From the heating solids left behind there, but
Need a way to obtain pure solvent
Taken from solution distillation's the way
Boiling liquids, evaporated steam
Condensates, to a new place

Mixtures Separating
The particles will settle again, decantation
Or is it filtration
Cause liquids pass right through the filter, no solids
Another is heating
Evaporation, distillation
Spinning centrifuging
It's separating a suspension

Let me see all the substances in mixtures
Broken all in parts of two or more
Choose a method on what's in the mixture
And on the physical, the properties
Separating mixtures
Broken into parts of two or more
Choose a method on what's in the mixture
And on the physical, the properties

Centrifuging happens in a cool machine
Spinning quickly in the block, man it's keen
They be separating solid particles

From suspensions spinning circles
Spins real fast centrifuge it goes
The solid particles
Are forced to the outside
Cause centrifuge's spinning more
Man the liquid can be poured off
Filtered off, yeah filtered off
A useful tool, analyze what's in it
Know what's on my mind, yeah, chromatography is tight
Yeah right it's tight
Movin' slow cause dissolved in solution
Piece of paper shows travel of substance
Scientists identify they compare to get right

Mixtures Separating
The particles will settle again, decantation
Or is it filtration
Cause liquids pass right through the filter, no solids
Another is heating
Evaporation, distillation
Spinning centrifuging
It's separating a suspension

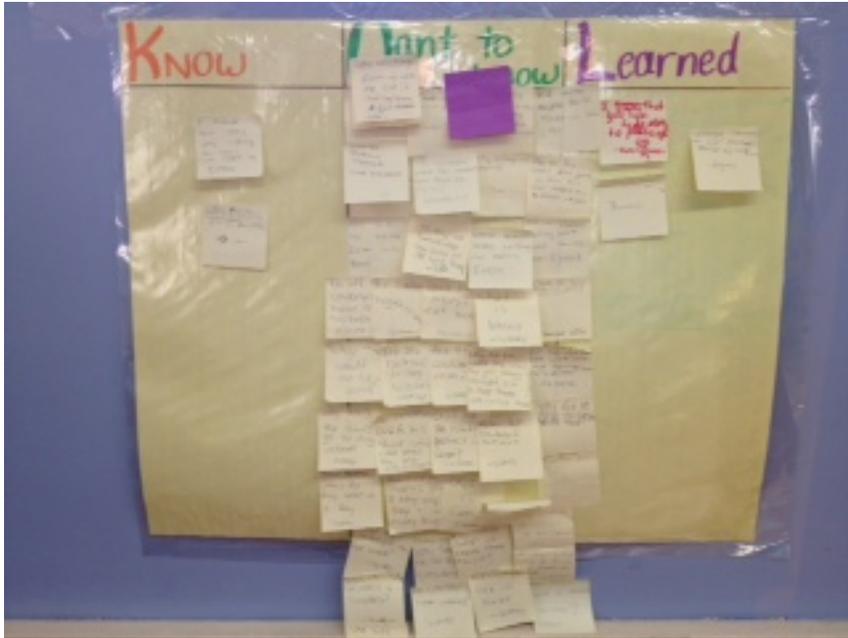
Straight up now tell me do you really want to separate a mixture
Oh, oh, oh
Or is it just a solution

Straight up I tell ya I just really want to separate a mixture
Oh, oh, oh
Come on is it just a liquid, son

Straight up now tell me do you really want to separate a mixture
Oh, oh, oh
Or is it just a solution
Straight up I tell ya I just really want to separate a mixture
Oh, oh, oh
Come on is it just a liquid, son
(mixtures separate, they separate)

● **Music**

○ "Work Out" by Various Artists



HW Application:

The homework for this lesson will consist of defining words stated in the song that pertain to separating mixtures and solutions. These words will be: decantation, filtration, evaporation, distillation, centrifuging, suspension, chromatography, and centrifuge. the students will define each of these and write a small description of how it is used in the separation of mixtures and solutions

Game Board (Science)

Rationale: This project will allow students to research the differences of mixtures and solutions as well as the characteristic for each. This will be a fun way to get the students to remember the differences between mixtures/solutions and homogeneous/heterogeneous.

Objectives:

- Before the activity, students will be able to list characteristics of mixtures and solutions based on previous knowledge with 90% accuracy.
- During the activity, students will create a game board following the guidelines given to them on a rubric.
- After the activity, students will be able to answer other student's questions on their game boards with 90% accuracy.

Standards:

- RL.5.7- Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- W.5.7- Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

Introduction/Motivation:

Today we are going to create our own games to play with trivia on mixtures and solutions! Can anyone tell me some facts that we have learned about mixtures or solutions?

Development:

- First we will review all that we have learned about mixtures and solutions.
- Students will then decide on a mixture or solution to research.
- After we will review what is expected for the project which includes: color, at least 10 questions to ask during the game (these questions will be written on index cards with the answers on the back), four drawing or pictures pertaining to their mixture/solution, their name, a creative title, and correct spelling/grammar.
- Once the directions have been explained to the class, the students will receive a blank game board and begin their research.
- Since the research will take most of the time, the remaining portion of the game board will be completed for homework.
- During the next day of instruction, the students will be in stations playing each other's game boards with 5 people at each station.
- To close the lesson, the students will return to their seats and we will ask the students to turn and talk to their partner about two things they learned from other people's game boards that they did not know prior to this lesson.

Assessment:

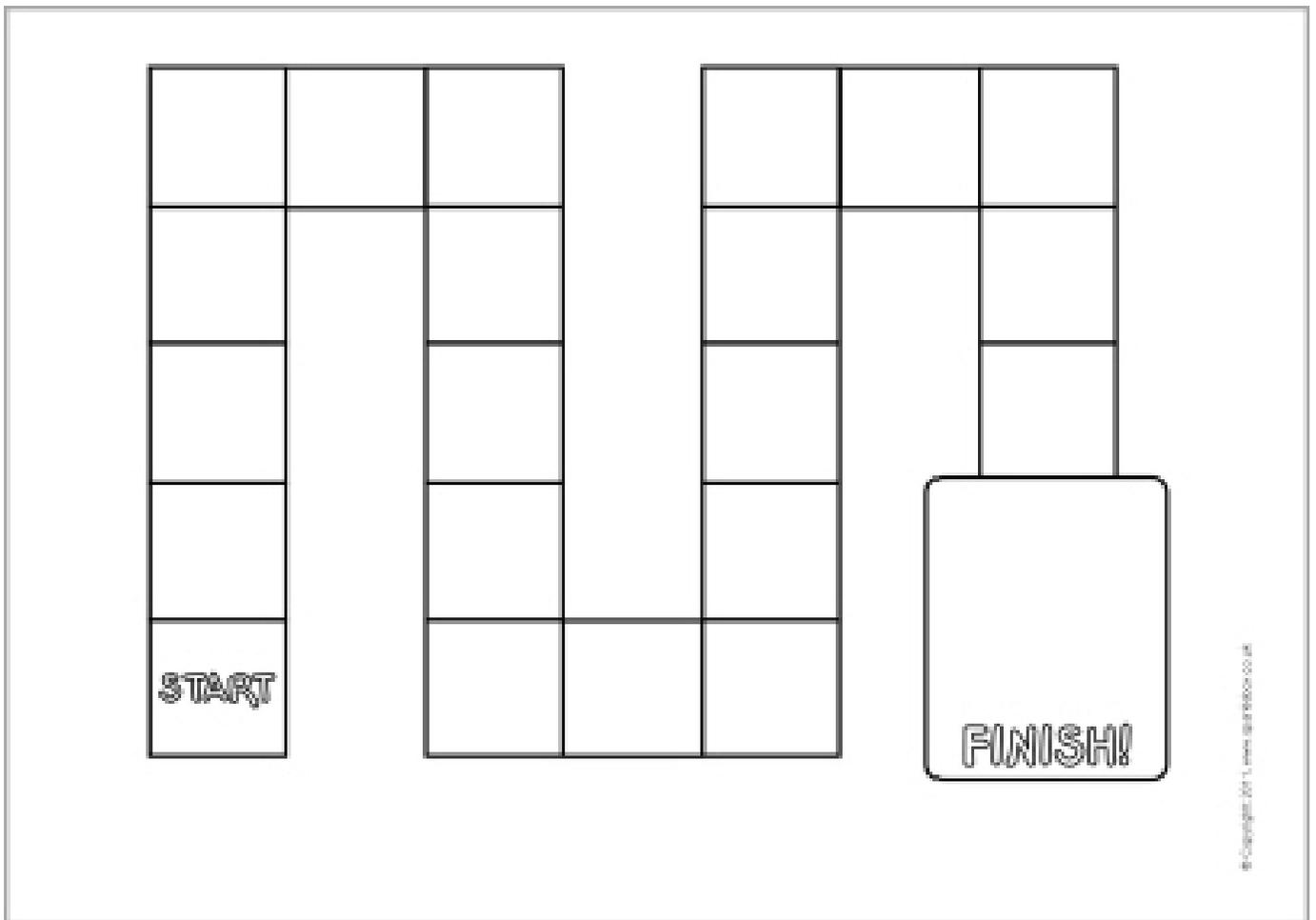
The assessment for this lesson will be the completed product of their game boards. The assessment of the game board will be based off of the rubric given to them during the lesson.

Adaptations:

During this lesson, George and Ruthie will be able to complete their game board on their Chromebooks. Amani and Ruthie will also only need to have 5 questions on their game board.

Co-Teaching Approach

This lesson will contain parallel teaching during the instructional portion of the lesson when giving the students directions on how to create their game board. The following day, while the students play the games we will use one teach one drift to make sure that students are staying on task while still having one of us in the front of the class for students to ask questions.



Rubric for Game Board

Name:

Game board includes: Name Title Name of mixture/solution	1	2	3	4
Game board has color, creativity, and organization	1	2	3	4
The purpose of the game relates directly to mixtures/solutions	1	2	3	4
Each space in the game board contains directions for the player	1	2	3	4
The game contains at least 10 questions/answers on index cards	1	2	3	4
There are at least 4 pictures/drawings that have to do with mixtures/solutions	1	2	3	4

Assessment

Long term assessment

Students will complete a unit project as their long term assessment during the mixtures and solutions unit. The project will be for the student to pick a mixture or solution and research facts about that mixture. This project will be an accumulation of all of the activities that have been completed throughout the unit. This will also include a short presentation about their mixture or solution. Students will have the option to create their own mixture or chose an existing one. Not only will the students have to talk about the scientific makeup of their mixture. But also where this mixture can be found and what it can be used for. It will also have to include why the mixture or solution is that. This will need to include the characteristics of a mixture or solution and why their project is on one or the other. There will also be an alternative assessment that includes writing a research paper about what they learned in place of presenting to the class. Having an alternative assessment will help those students who are not comfortable speaking and presenting in front of their peers. This research paper will include all of the components of the speech, but without having to speak in front of the class. The last option that students will have as a long term assessment is to bring in their mixture or solution and show the class how it is made and characteristics of the mixture/solutions. This is a project that can only be done with certain mixtures or solutions because some of them cannot be made safely in front of the class. If this is the option that the student chooses, they will need to first get it approved by a teacher before proceeding with the assignment. The students that choose this method can either create a poster or note cards that have the facts that go along with their mixture or solution.

The students will be assessed with a rubric that includes, creativity, content, presentation/neatness, spelling and grammar. The students will help to create the specifics of what each score will mean on the rubric. This will help the students understand what each score means as well as hold them accountable for the work that they do. The possible scores will be 1-4 with a total possible score of 16 points for the class. This would be a great overall project to assess what the students are retaining about what they learn through various activities.

Presentation includes: Name Title Name of mixture/solution	1	2	3	4
Presentation is clear, loud, neat and understandable	1	2	3	4
The purpose of the presentation relates directly to their mixtures/solutions	1	2	3	4
The presentation contains at least 10 facts about their mixture/solution	1	2	3	4
There are at least 4 pictures/drawings that have to do with mixtures/solutions	1	2	3	4

Short Term Assessment

For this unit, short term assessments will be done daily through summative assessment done in the lessons. Doing these summative assessments lets us track the students' daily understanding of the materials being taught and what instructional strategies they strive with and which ones do not reach the students. These short term assessments can be found in the individual lessons plans throughout the unit under **assessments**. The summative assessments consisted of homework application, creating graphic organizers, and using visuals such as worksheets, science notebooks, and anchor charts.

Emilie Petry Reflection

I worked with Madison to create a unit plan on mixtures and solutions for fifth grade. We decided to do our unit on this topic because we were able to observe this unit firsthand in our junior practicum class this year at Village School in the West Windsor Plainsboro school district. This class was comprised of 25 students (15 boys and 10 girls), three of these students were classified with IEPs for the reasons listed under **adaptations**. While creating this unit it became evident to me how difficult it was to create a unit. The amount of planning and creative thinking it takes to create a unique and relevant unit is extremely time consuming and challenging. Doing this unit proved to me once again how devoted teachers are to their jobs. It amazes me how well teachers have to know their students in order to truly be able to differentiate instruction to meet each student's individual needs.

Since we were able to spend the semester getting to know the students in our class, it was easier for us to imagine doing these lessons with the students. Since our class was at a higher level of thinking, we incorporated mostly tactile and exploratory activities that made the students apply their knowledge that they have learned. We spent less time on instruction and more time on application to keep the students engaged and challenged so that they did not become bored with the unit. Although many of our activities were group based, they were adapted to meet each student's learning needs by accommodating their needs within the groups and individual activities.

We incorporated many strategies that we learned this semester in SPE 304 and during our observations such as anchor charts, integrating music, using large group and small group instruction, using different co-teaching strategies, and utilizing technology in the classroom and during instruction. All of these approaches contributed to making a unique and individualized unit that met the needs of all of our students.

It was easy for Madison and I to connect our lessons and unit to the Common Core Standards and the CEC Standards since this unit is relevant to the materials taught in fifth grade. We looked at the CEC standards before creating each activity to match an activity to a standard before deciding how to create each lesson. By doing this, we not only met the standards but we also created a unit that could be used in both a general education and a

special education classroom. We prepared for this unit by researching mixtures and solutions and looking at our cooperating teacher's materials for her unit on mixtures and solutions (CEC Standard 1). We also kept all of our students learning differences in mind while creating the lessons to make sure the lessons were appropriate for each student and accommodating the lessons if needed (CEC Standards 2&3). Since this classroom is extremely diverse with not only learning strengths and needs, but also culturally and ethnically, we wanted to create a comfortable learning environment in the classroom. We did this by incorporating group work into most of our lessons which made learning very cooperative in this unit (CEC Standard 5&6).

Overall, I am very pleased with the way our unit came out. I believe we put a lot of time and thought into how to best meet the needs of our students and keep them engaged during the lessons and activities. I believe that we incorporated many types of learning styles, instructional methods, co-teaching methods, and adaptations to keep the unit relevant and interesting for our students. Madison and I collaborated well together because we have co-taught in our co-ops for the last two semesters and know each other's teaching and learning styles very well. I am happy that we were able to experience the process of creating a unit and believe that it will be extremely beneficial to us in the future.

Madison Csizmadia Reflection

I worked with Emilie to create a unit that would channel some of the students creative skills that would stimulate different parts of their brain to help them retain the information. Our class at Village Elementary school is a very diverse group of students in every aspect of the word. We have some students that are classified with different disorders, but the students in the class have no idea and that is what is amazing about how the classroom is run. This unit is created in a way to add on to this organizational technique and show no obvious differences between students. The students will have options and this helps to maintain a cohesive classroom.

Thinking about our class while creating this unit helped me to realize how great their minds are. The students are very creative and have non-traditional ideas about how things can be done. This isn't always fostered in their current classroom. Students are often told that they must get a right answer and do a certain procedure to get to the end result. Sometimes this needs to be done to ensure that the content is understood, but there are several occasions when there is a different way of doing things. This became very clear to me while completing this unit. At first I thought that my thinking was incorrect when it came to how to teach students because I didn't have any experience actually teaching. But while sitting with these students with the unit in mind, I realized that their creative needs and ideas had to be fostered in a way that could help them reach the ultimate goal of understanding the topic.

This unit was difficult to put together with all of the different aspects that needed to be included. It was a test of knowledge and understanding about how to relate different subjects to one idea or lesson. The unit made me realize that it is going to be difficult to get ideas across

on paper. The ideas that we had were very vivid, but making that come across on paper before completing the lesson and having pictorial evidence was a challenge. But I believe that with the lessons that we chose, we were able to make our ideas very clear.

Working with Emilie was a pleasure as always. We have come to know each other pretty well through the education system at Rider. Co-teaching comes naturally for us because we have experienced this through being in the field. The ideas were definitely there because we related it directly to the field as we were there and participating. Emilie and I have similar teaching styles and our weakness are made up by each other's strengths. The lesson ideas came very easily to us because we wanted the students to experience activities that they weren't currently participating in throughout the classroom.

Overall, our unit is set up for very diverse students and meets the needs of many which is important to make students feel as if they aren't just doing worksheets and reading text. Students need their minds to be stimulated and challenged, not limited and standardized. There are so many ways that the students can get from A to B, this should not be held back by the idea of the students doing it the right way. There is so much that we can learn from students and doing this unit reinforced this idea in my mind. Students are our future and we need more teachers that have gone through a program similar to ours to ensure that students are getting the most out of their education.