Station Cards for Part A

Station 1

white beads	yellow beads

1. Make a chart in your journal. Record the properties of each type of bead.

2. Measure and record the mass of 30 mL of white beads.

3. Pour the beads into the mixing bowl.

4. Measure and record the mass of 30 mL of yellow beads.

5. Pour the beads into the mixing bowl and stir until evenly mixed.

6. How have the properties of the beads changed?

7. Discuss how an object's properties of mass and volume affect its behavior in water.

8. Design and test a way to easily separate the two types of beads. You may use any of the materials at this station. ***You may not, however, touch the white beads or the yellow beads with your hands.***

9. Discuss how well your plan worked and how you can improve it.

10. Discuss how you used the properties of the beads to separate the mixture. Record your ideas.

Station Cards for Part A

Station 2

yellow beads	silver beads

1. Make a chart in your journal. Record the properties of each type of bead.

2. Put 30 mL of the yellow beads into cup A.

3. Put 30 mL of the silver beads also into cup A.

4. Stir the beads with a craft stick until mixed.

5. How have the properties of the beads changed?

6. Examine the other materials at this station.

7. Design a way to easily separate the two types of beads so that the yellow beads go into cup B and the silver beads go into cup C. ***You may not touch the yellow beads or the silver beads with your hands.***

8. Discuss how well your plan worked and how you can improve it.

9. Discuss how you used the properties of the beads to separate the mixture. Record your ideas.

Station Cards for Part A

Station 3

pebbles	gravel	sand

1. Make a chart in your journal. Record the properties of the pebbles, gravel, and sand.

2. Place 50 mL of pebbles into the mixing bowl.

3. Place 50 mL of gravel into the mixing bowl.

4. Place 50 mL of sand into the mixing bowl.

5. Stir the pebbles, gravel, and sand with a craft stick until evenly mixed.

6. How have the properties of the three solids changed?

7. Examine the other materials at this station.

8. Design a way to easily separate the three types of solids so that each one goes into a separate bowl.

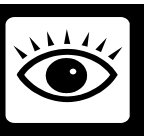
9. Discuss how well your plan worked and how you can improve it.

10. Discuss how you used the properties of the materials to separate the mixture. Record your ideas.

Station Cards for Part A

Station 4

Eye Protection Required!



1. Find wells # 1-3. Place enough drops of water to fill them three-fourths full.

2. Add 1 level spoon of sugar to well #1, 1 level spoon of sand to well #2, and 1 level spoon of salt to well #3.

3. Use your toothpick to stir each mixture. Observe and record your results in a data table similar to the one below.

4. Find wells # 4-6. Place enough drops of vinegar to fill them three-fourths full.

5. Add 1 level spoon of sugar to well #4, 1 level spoon of sand to well #5, and 1 level spoon of salt to well #6.

6. Use your toothpick to stir each mixture. Observe and record your results in your data table.

#	Mixture	Observations
1.	water + sugar	
2.	water + sand	
3.	water + salt	
4.	vinegar + sugar	
5.	vinegar + sand	
6.	vinegar + salt	

Station Cards for Part A

7. What happened in mixtures **#1, 3, 4**, and **6** that did NOT happen in the other mixtures?

8. Compare your results to the data table below. Look for connections. In your own words, what is a **solution**?

#	Mixtures	Observations
1.	Water + sugar	☑ EXAMPLE of a solution
2.	Water + sand	NON-EXAMPLE of a solution
3.	Water + salt	☑ EXAMPLE of a solution
4.	Vinegar + sugar	☑ EXAMPLE of a solution
5.	Vinegar + sand	NON-EXAMPLE of a solution
6.	Vinegar + salt	☑ EXAMPLE of a solution

9. Discuss how Galveston beach would be different IF the mixture of "water + sand" was an example of a solution rather than a non-example. Record your ideas.

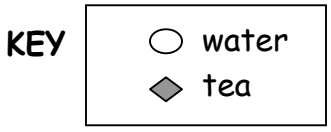
Station Cards for Part B

Station 1

1. Observe the properties of the mixtures in the 3 jars. How are they the same? How are they different? Compare the mixtures to their two ingredients.

2. Read the 3 recipe cards for making instant tea. Match the recipe cards with the mixtures by placing them in front of the jars. Discuss your reasoning.

3. Look at the 3 diagram cards. Using the key below, discuss which of the 3 diagrams best models each of the 3 mixtures and why. Place the cards in front of the jars.



4. If you were able to taste the 3 solutions, how do you think they would compare? Did you use the words "stronger" and "weaker" in your description? Finish these statements:

- The more solid you dissolve in a liquid, the _____ the solution is.
- The less solid you dissolve in a liquid, the _____ the solution is.

5. Brainstorm a list of ways that you can make a solution become stronger.

6. Remove the "Check It Out" card and compare your answers. Discuss what you have learned at this station.

7. Write in your journal the main ideas from this station.

Station Cards for Part B

Check It Out at Station 1

1. Did you observe that all 3 mixtures were solutions? How can you tell? Do you see any particles or pieces of matter? Did you notice that the main difference in the 3 mixtures is the darkness of their color? They are varying shades of brown.

2. Did you match the recipe of 50 mL of water + 1 spoon of tea to the lightest colored solution? If so, great job! Did you match the recipe of 50 mL of water + 3 spoons of tea to the darkest colored solution? If so, then I bet you matched the recipe of 50 mL of water + 2 spoons of tea to the medium-dark colored solution!

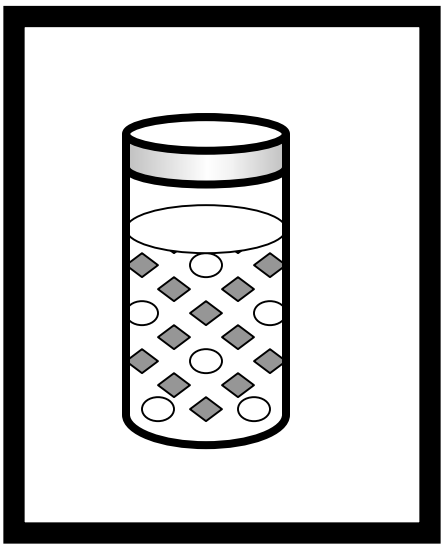
3. Did you match the diagram with the greatest amount of tea particles to the darkest colored solution? Way to go! Did you match the diagram with the least amount of tea particles to the lightest colored solution? That's great!

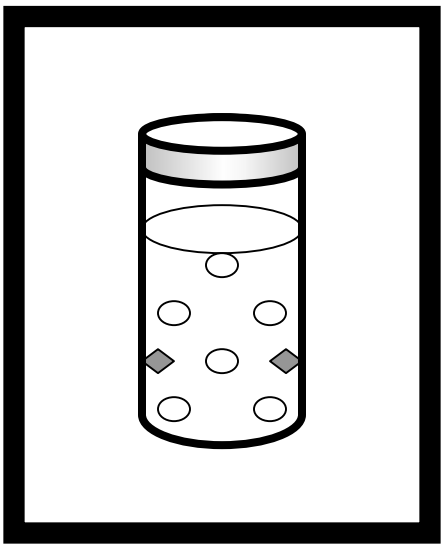
4. The more solid you dissolve in a liquid, the stronger the solution is. The less solid you dissolve in a liquid, the weaker the solution is.

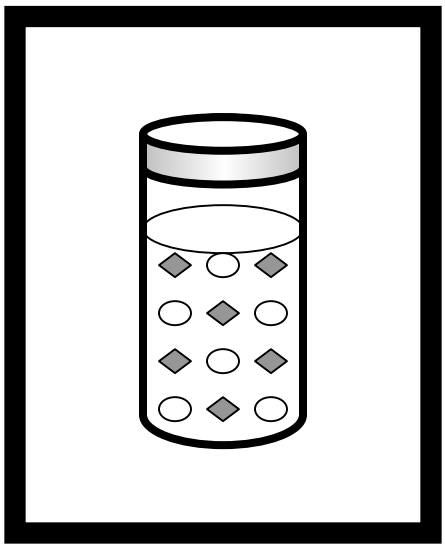
5. Be ready to share your ideas with the class!

6. Did you record the main ideas of this station in your journal?

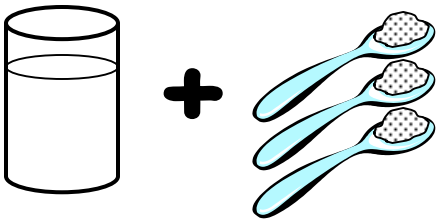
Station Cards for Part B







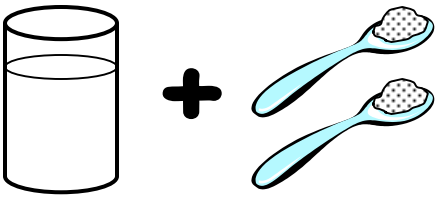
Recipe for instant tea



50 mL of water

3 spoons of tea

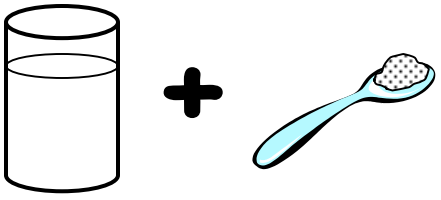
Recipe for instant tea



50 mL of water

2 spoons of tea

Recipe for instant tea



50 mL of water

1 spoon of tea

Station Cards for Part B

Station 2

1. Pour 50 mL of water into the cup. Add 10 plastic beads and stir. Observe what happens and discuss why you think it happens.

2. Add 15 mL of sugar to the cup of water and stir. Observe what happens and discuss why you think it happens.

3. Compare the properties of the sugar water solution to the properties of the water. What has changed?

4. The colored liquids in the 3 bottles are saltwater solutions with food coloring. Place one pencil with the thumbtack down into each solution. What do you observe? What is your explanation for your observation?

5. Remove the "Check It Out" card and compare your answers. Discuss what you have learned at this station.

6. Write in your journal the main ideas from this station.

Station Cards for Part B

Check It Out at Station 2

1. Did you observe that the yellow beads sank in the plain water? Were you able to explain that the beads sank because their density is greater than the water's density? Hopefully, you also discussed that the buoyancy or force of the water pushing up was not great enough to keep the beads floating.

2. After adding the sugar, did you observe that the beads floated up to the top? Did you discuss that adding the sugar to the water must have increased its density?

3. The density of the water increased when the sugar dissolved to make the solution. This increased the buoyancy or force that was able to push the beads up and keep them floating.

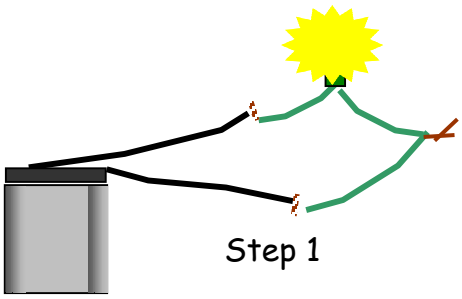
4. Did you decide that the pencils floated at different levels in the saltwater solutions because the amount of salt was different in each tube? The pencil floated the highest in the green solution because it has the most salt, which means it has the greatest density. The pencil floated the lowest in the yellow solution because it has the least salt, which means it has the lowest density.

5. Did you record the main ideas of this station in your journal?

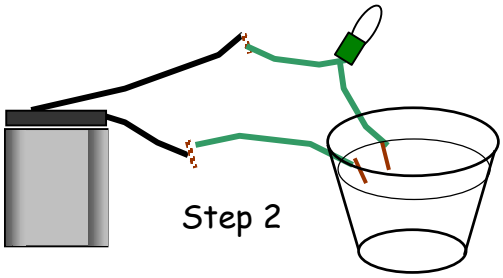
Station Cards for Part B

Station 3

1. Use the battery, bulb, and wires to make a complete circuit that will cause the bulb to light.



2. Use your materials to test if plain water is a conductor of electricity. Be sure the two free ends of wire are in the liquid ***but are not touching each other.***



3. Add 1 level spoon of salt to the water and stir. Test to see if the solution is a conductor.

4. Test to see if increasing the amount of salt makes any differences.

5. Clean out your cup and repeat the tests using a sugar water solution. Record your results in your journal.

6. Clean out your cup for the next group.

7. Remove the "Check It Out" card and compare your answers. Discuss what you have learned at this station.

8. Write in your journal the main ideas from this station.

Station Cards for Part B

Check It Out at Station 3

1. Did you get the bulb to light? If so, you made a complete path for the electrical current to travel through. Did anyone in your group remember that this complete path is called an electrical circuit?

2. Did the plain water conduct electricity? If it did, you need to retest and make sure the two free wires are not touching each other.

3. Did the saltwater solution conduct electricity? If it did not, you may want to test it again and make sure your circuit or pathway is complete.

4. By adding more salt, were you making the saltwater solution stronger or weaker?

5. Did the solution made with sugar conduct electricity? If it did, you may want to test it again and make sure the two free wires are not touching each other.

6. Did you record the main ideas of this station in your journal?

Station Cards for Part B

Station 4

1. Compare the samples of table salt and Epsom salt to the crystals found in the containers marked A and B. Which container of crystals was formed from a solution of Epsom salt? How can you tell? Where did the water go that dissolved the Epsom salt?

2. Observe the four solids on the plate. One of the samples is an example of a mixture. Which one do you think it is? Why?

3. How and where do you think this mixture was made?

4. Compare the two samples in the bowl. They are both examples of the same type of mixture. How are they alike? How are they different? What do you think caused their differences?

5. Observe the sample in container E. It was also formed from a mixture. Place it into the bowl of water. What happened and why?

6. Remove the "Check It Out" card and compare your answers. Discuss what you have learned at this station.

7. Write in your journal the main ideas from this station.

Station Cards for Part B

Check It Out at Station 4

1. The Epsom salt is in container B. You can tell because of the shape of its crystals. The water from the solution has turned into a gas by evaporating into the air.

2. The rock that is made of mixed colors is the mixture. Its name is granite. Granite is a mixture made up of minerals. You can see pieces of the 3 minerals mixed up in the rock. Just in case you were wondering, the clear mineral is named quartz, the black one is named mica, and the pink one is feldspar.

3. This mixture was made by nature. It actually began deep inside the earth as a hot liquid called magma. As the mixture cooled, the crystals formed.

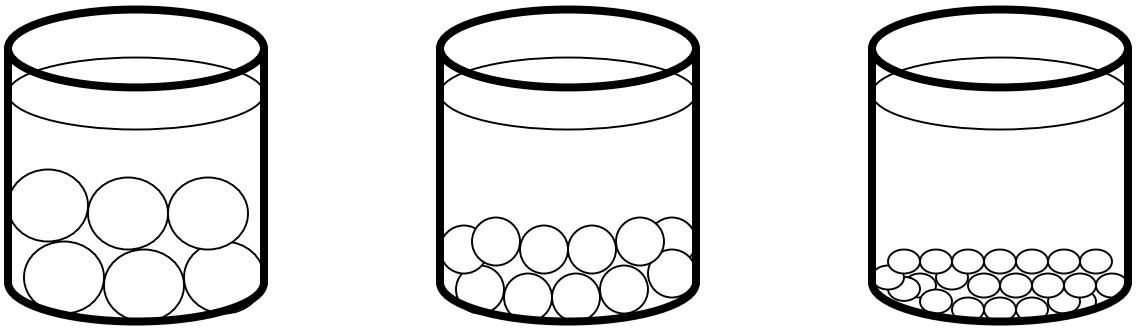
4. The two rocks are both granite and they are made up of the same types of crystals. The size of the crystals, however are different. The difference in crystal size was caused by how fast the hot, liquid magma cooled off. The rock with the larger crystals cooled slower, the rock with the smaller crystals cooled faster.

5. The rock is named pumice and it actually floats in water. So, we know its mass is less than its volume. The pumice also formed from a hot liquid from the earth. Trapped gases inside the mixture escaped as it cooled off very quickly. This left many tiny holes in the rock causing it to have a density less than water. Do you think granite can float? Try it out and see if you're right!

6. Did you record the main ideas of this station in your journal?

All Mixed Up

MIXTURES: Each of these containers holds a mixture made of water and solid beads.

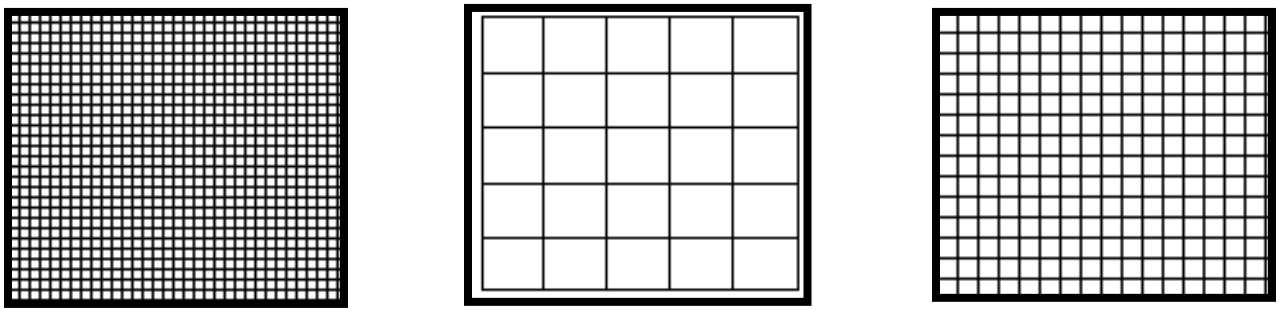


A **B** **C**

1. Study the diagrams carefully. What can you tell about the properties of the 3 sizes of beads in the mixtures? Include information about their masses, volumes, densities, and buoyancy in water. Use labeled drawings, sentences, and charts to organize your information.

2. Do these mixtures appear to be solutions? What evidence do you have to support your answer? Use labeled drawings and sentences to explain your answers.

STRAINERS: Each of these screen strainers allows water to be poured through it.



1 **2** **3**

3. Develop a plan for separating each of the 3 mixtures by using the strainers. Use a ruler to collect data about the beads and the holes in the strainers. Organize the data into a table and communicate which strainers can be used to separate the parts of which mixtures.

4. Which of these strainers can you use to separate the parts of a saltwater solution? Use labeled drawings and sentences to explain how you would separate the salt from the water.

All Mixed Up

Performance Task-Scoring Rubric

	4	3	2	1
Understands properties of matter including mass, volume, density, and buoyancy	Correctly identifies information about 4 of the 4 listed properties	Correctly identifies information about 3 of the 4 listed properties	Correctly identifies information about 2 of the 4 listed properties	Correctly identifies information about less than 2 of the listed properties
Understands relationship between solutions and mixtures	Correctly identifies relationship and provides strong supporting evidence	Correctly identifies relationship but provides limited supporting evidence	Correctly identifies relationship but provides no supporting evidence	Does not correctly identify relationship
Collects and organizes data	Constructs a well-organized data table; makes reasonably accurate measurements with appropriate units	Constructs a somewhat organized data table; makes reasonably accurate measurements with appropriate units	Constructs a somewhat organized data table; makes errors in measurements and uses inappropriate units	Does not include a usable data table and measurements
Draws conclusion	Correctly matches all 3 mixtures with the appropriate strainers that can separate the parts	Correctly matches 2 of the 3 mixtures with the appropriate strainers that can separate the parts	Correctly matches 1 of the 3 mixtures with the appropriate strainers that can separate the parts	None are correctly matched
Applies knowledge	Explanation is accurate, demonstrates clear understanding of a solution, and includes exceptional details	Explanation is accurate and demonstrates clear understanding of a solution	Explanation is partially accurate and demonstrates some understanding of a solution	Explanation is missing or inaccurate