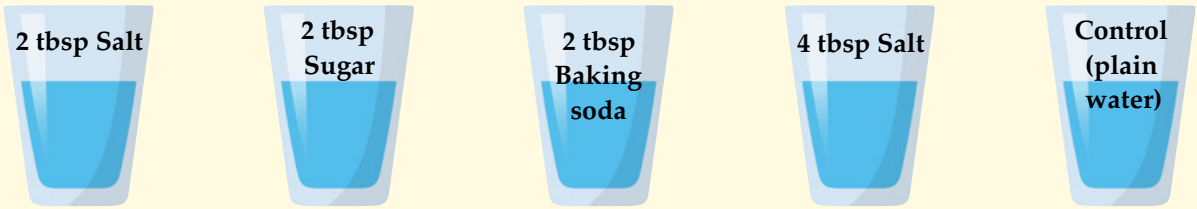
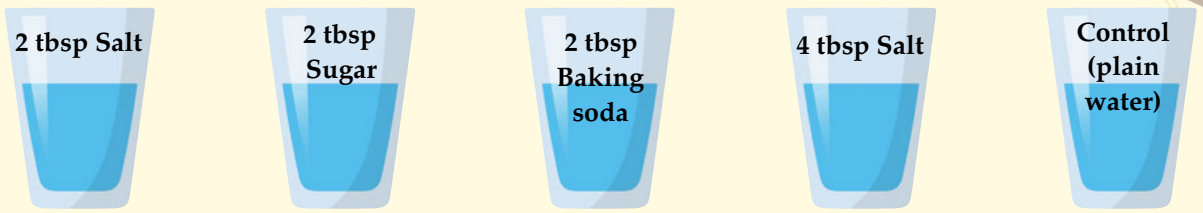
Name: _____ Date: _____

Water Density Investigation

Predict what will happen to your object when it is placed in each of these solutions. Will it sink or float? Think about which solution will have a higher density.



Record your observations for each one. What happened to the object when you placed it into the solutions?



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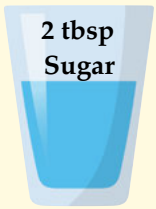
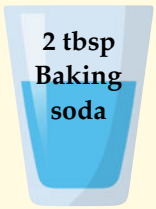
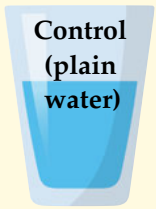






Predictions

Observations

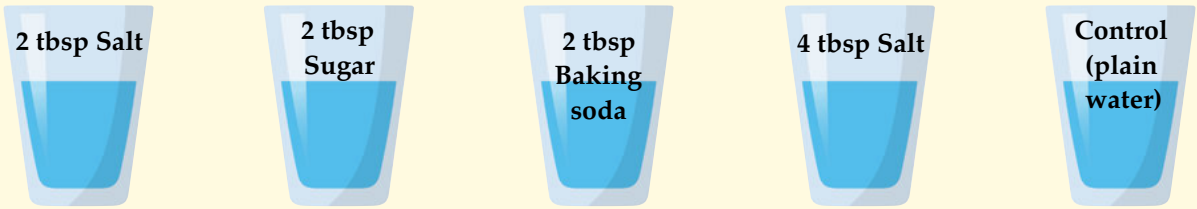
Can you explain why you saw these results? Use the word bank to help you.

Higher density	Float
Lower density	Sink
Molecules	Solution
Salt	Atoms

Name: _____ Date: _____

Water Density Investigation

Predict what will happen to your object when it is placed in each of these solutions. Will it sink or float? Think about which solution will have a higher density.



Predictions

Observations

Can you explain why you saw these results? Try to include the word **density** in your explanation.

Name: _____ Date: _____

Salt water density experiment

- Create some salt water solutions using different amounts of salt in the same amount of water.
- Colour each different solution with a different colour food colouring.
- Have half a cup of fresh water ready.
- **Slowly and carefully** pour the highest density water into the fresh water (following your teacher's instructions).

Predict what will happen as you gently add two of the different solutions together. Why do you think this will happen?

Draw a diagram of what happened. Label the highest and lowest density solutions.

Dissolving salt into water makes a _____ . When salt is added to water it changes its _____ . Water with **more** salt dissolved into it will have a _____ density than a solution with less salt dissolved into it. Solutions with higher densities will _____ and solutions with lower densities (like _____) will rise to the top.

fresh water	density
solution	sink
higher	

Name: _____ Date: _____

Salt water density experiment

- Create some salt water solutions using different amounts of salt in the same amount of water.
- Colour each different solution with a different colour food colouring.
- Have half a cup of fresh water ready.
- **Slowly and carefully** pour the highest density water into the fresh water (following your teacher's instructions).

Predict what will happen as you gently add two of the different solutions together. Why do you think this will happen?

Draw a diagram of what happened. Label the highest and lowest density solutions.

Explain what is happening using scientific language.

Water Density Investigation

In this investigation the children will develop their prediction, observation and explanation skills as they observe what happens to an object placed in different water solutions. They will be looking for the effects of changing the water's density; seeing if/how the objects float in the water.

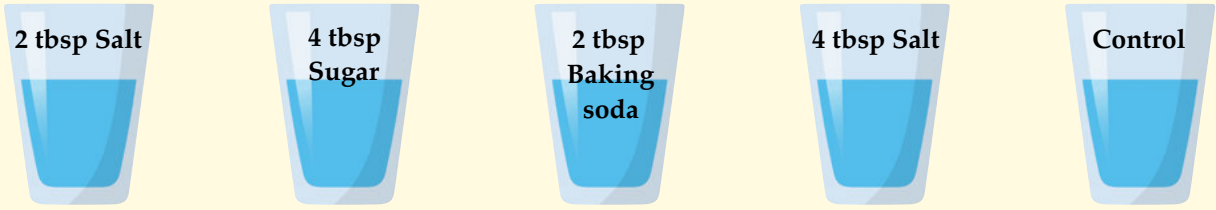
Equipment:

- Transparent cups
- Warm water
- Spoons
- Objects to put into the solutions*
- Salt
- Sugar
- Baking soda

* These objects need to sink in plain water but not be overly heavy. Fresh raw eggs, or grapes, work well. It's worth practising this experiment to get the measurements and objects correct.

Before the children start the experiment show them that the objects you are using sink in plain water. Explain to them that this is the control from the experiment. It is a version of the experiment where nothing has been added or changed, so they, as scientists, can compare the other results to it. They can use this information to base their predictions on.

Give each group five cups and label them with the solution which will be in each: 4 tbsp sugar, 2 tbsp salt, 2 tbsp baking soda, 4 tbsp salt and control (plain water).
*You may need to add more salt/sugar/baking soda to the water, depending on what kind of objects or how much water you are using in this experiment. Solutions can be pre-prepared if time is limited or the children can make their own.



Children place their object in each solution and observe what happens, recording this on their worksheet. If you have enough, having one object in each solution helps the children compare their observations more easily. The objects should float in the concentrated salt water solution, but may not in the weaker salt water or sugar water (sugar is less dense than salt. It will take more sugar to make the water dense enough to make things float).

This is a good opportunity to ask them questions such as:

- Is it only salt that affects the water's density?
- Do you think adding more salt/sugar would have an effect? Why/Why not?
- What can you tell me about the density of each solution?
- Can you put the solutions in order of highest to lowest density?
- What do you think would happen if the water had the same density as the object?

Water Density Layers

This investigation allows the children to experiment with different water densities and practise generating their own 'What if…?' questions. Using coloured variations of salt water, the children can problem solve and observe the layers that they can create with water of different densities. A follow-up investigation could involve experimenting with the densities of different liquids e.g. water, oil, milk, syrup etc.

Equipment:

- Transparent cups
- Warm water
- Spoons
- Food colouring in at least three different colours.
- Salt/sugar
- Pipettes (optional)

Prepare some salt solutions of different strengths by adding doubling amount of salt to the same amount of water e.g. 1 tsp, 2 tsp, 4 tsp, 8 tsp etc. Label the strengths of each solution. These solutions can be preprepared in larger quantities beforehand if time is limited.

Add food colouring to each one. If you would like to challenge the children to create a rainbow, the colours need to match the order of the density e.g. red should have the most salt etc.

To create the layers, the water must be poured **gently and carefully** with the receptacle (which can just be another cup) at an angle so the water runs down the side. This is so the different layers don't become too agitated and mix together. Alternatively, pipettes can be used to add amounts of water gently.

It is best to start the children with using two colours, or one colour and clear water to begin to see the effects of water density. They can practise their pouring technique and then move on to using more colours to create traffic light colours, rainbows and other patterns.

You could challenge the children by not telling them which coloured solution has the highest density and allow them to investigate by making layers to identify the highest density.

Titanic: Science Answers Worksheet 1D

Name: _____ Date: _____

Salt water density experiment

- Create some salt water solutions using different amounts of salt in the same amount of water.
- Colour each different solution with a different colour food colouring.
- Have half a cup of fresh water ready.
- **Slowly and carefully** pour the highest density water into the fresh water (following your teacher's instructions).

Predict what will happen as you gently add two of the different solutions together. Why do you think this will happen?

Draw a diagram of what happened. Label the highest and lowest density solutions.

Dissolving salt into water makes a ___solution___. When salt is added to water it changes its ___density___. Water with **more** salt dissolved into it will have a ___higher___ density than a solution with less salt dissolved into it. Solutions with higher densities will ___sink___ and solutions with lower densities (like ___fresh water___) will rise to the top.

fresh water	density
solution	sink
higher	