

The Jello/Gelatine Experiments

Introduction

The Jello Experiment



The Gelatine Experiment

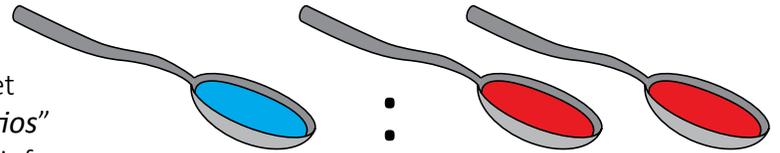


Summary

Both experiments will test the densities of hardened gelatine depending on how much water is added. The Gelatine Experiment will only test the density of using gelatine alone, while the Jello Experiment will also reveal the effect that sugar has.

Learning Points

- **Basic experiment vocabulary**
- **Basic ratios** - Please see supplemental info sheet at the end of this packet, *"A Brief Lesson on Ratios"*
- **How gelatine works** - Please see supplemental info sheet at the end of this packet, *"How does Gelatine Work"*

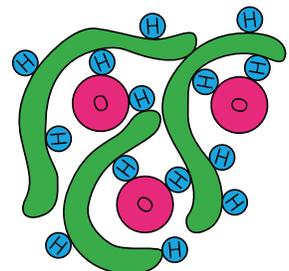


Resources

- *More information about how gelatine works:*
<https://www.cnet.com/news/appliance-science-the-firm-chemistry-of-gelatin/>
- *See why it's important to know how gelatine works:*
<https://diyeverything825231385.com/2019/11/01/brain-goop-a-halloween-hot-mess/>

Materials/Tools

- Jello (Jello experiment only)
- Gelatine (Gelatine experiment only)
- Water
- 5 Dixie cups OR a silicone mold with 5 slots (per experiment)
- Non-stick spray
- Small spoon
- Small mixing cup
- Microwavable cup
- Measuring spoons (teaspoon and tablespoon)



The Jello Experiment

Procedure

The Jello Experiment	
Water	Jello
2 tsp	4 tsp
4 tsp	4 tsp
6 tsp	4 tsp
8 tsp	4 tsp
10 tsp	4 tsp

Independent variable

Controlled variable

Dependent variables = What changes?

- **Controlled Variable** - The part of the experiment that DOESN'T change, in this case the amount of jello/gelatin used.
- **Independent Variable** - The part of the experiment that DOES change, in this case the amount of water used.
- **Dependent Variable** - The part of the experiment that changes as a result of the changing independent variable. In this case the density of the jello/gelatin may change, or the stickiness, or something else.
- **TSP** - Teaspoon

Step 1



Spray your dixie cups or silicone molds with non-stick spray. This will help the jello come back out of the mold. Since dixie cups are usually paper it will mostly absorb the spray, but it's good to get into the habit of spraying molds when using jello.

Step 2



Heat about a cup of water in the microwave until it boils. Help your child measure out the correct amount of hot water and pour it into a mixing small cup along with 4 tsp of Jello. Remember to level off each teaspoon of jello powder! This is a good time to talk about the importance of accurate measurements in experiments (and baking!)

OPTIONAL: 4 teaspoon = 1 tablespoon + 1 teaspoon, so you can measure that way if desired. This will make the experiment quicker, but also more confusing.

The Jello Experiment Cont.

Procedure

Step 3



Mix the water and jello together until it's not gritty anymore (the sugar has all dissolved). There will still be undissolved bits. Pour the mixture into one of the dixie cups and rinse the mixing cup with warm water before mixing the next batch.

Label the cups 2, 4, 6, 8, 10 to indicate the teaspoons of water added to each trial. Refrigerate the jello until solid, about an hour. To test if the jello has set, jiggle #8 to see if it has the consistency of normal jello (which it should!).

Step 4



Use something like a knife or a chopstick to break the seal between the jello and the mold, then use scissors to snip through the lip of the dixie cup and peel the rest of the paper off to get the jello out.

That's It!



Comprehension Questions:

Which trial looks most like regular jello?

The trial with 8 teaspoons of water is closest to the recipe on the jello box.

Which trial has the jiggiest consistency? The least jiggy? Why do you think that is?

Having lots of water makes it nice and jiggy! See the info sheet to learn how gelatine works.

Why didn't the trial with only 2 teaspoons of water set properly?

There is a lot of sugar in jello, that's why its such a tasty dessert! The sugar got in the way of the gelatine bonding with the water.

Taste each of the jellos - how do they differ in taste? Why?

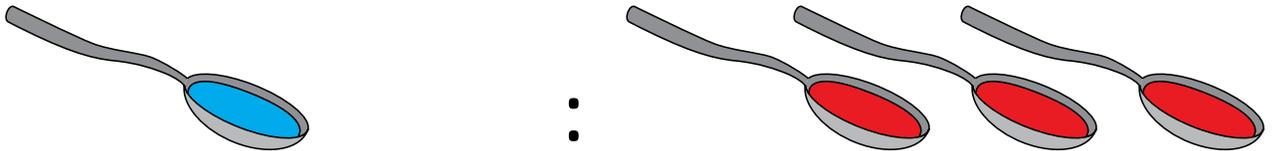
The trial with only 2 teaspoons of water is the sugariest because there is so little water for the sugar to mix with. It's mostly sugar, almost no water.

A Brief Lesson on Ratios

Ratios are written like this



For example, if the numbers above represented spoonfuls of something, it might look like this



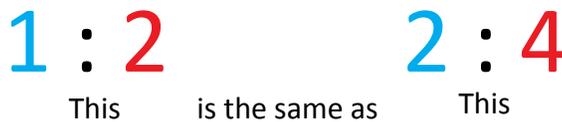
For making jello, we will be using ratios of Jello Powder to Water, like this



The ratio above is the typical recipe for making yummy jello! It would look like this



Ratios can be multiplied without changing the recipe



If you mix a small blob of red clay with a small blob of blue clay the same size, you get purple



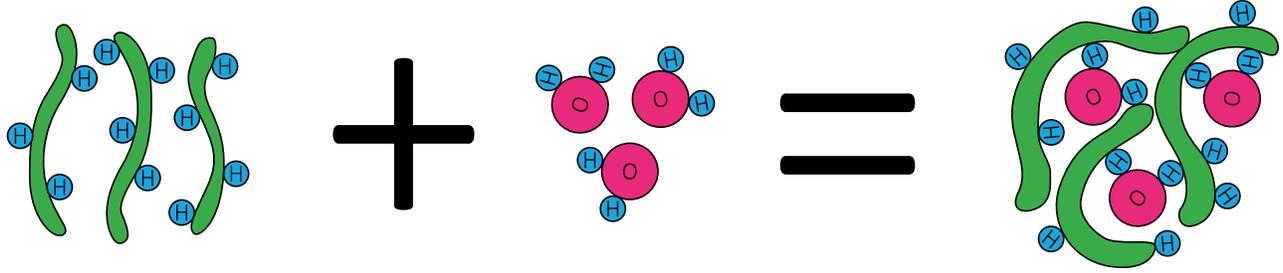
If you mix a large blob of red clay with a large blob of blue clay the same size, you get the same purple as with the small blobs

	Water	Jello
Trial 1	2 tsp	4 tsp
Trial 2	4 tsp	4 tsp
Trial 3	6 tsp	4 tsp
Trial 4	8 tsp	4 tsp
Trial 5	10 tsp	4 tsp

These are the ratios we'll be using for our experiment. Which trial (1-5) is the original jello recipe?

How Does Gelatine Work?

Adapted from Appliance Science: The Firm Chemistry of Gelatin by Richard Baguley & Colin McDonald, September 10, 2015



Powdered Gelatine

Gelatine is made out of amino acid chains with hydrogen atoms attached

Water

Water is made out of one oxygen atom with two hydrogen atoms attached

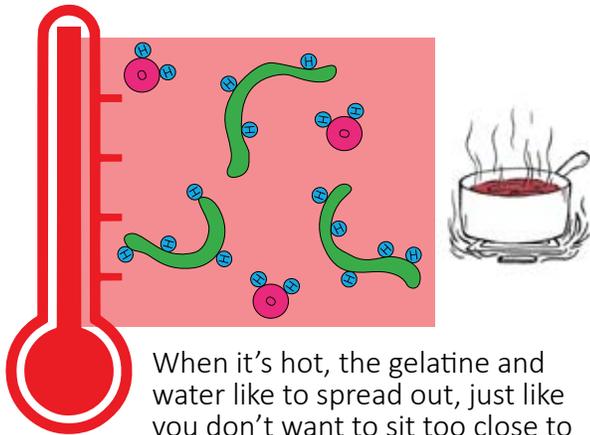
Set Gelatine

The hydrogen atoms from the amino acid chains and the water molecules bond together

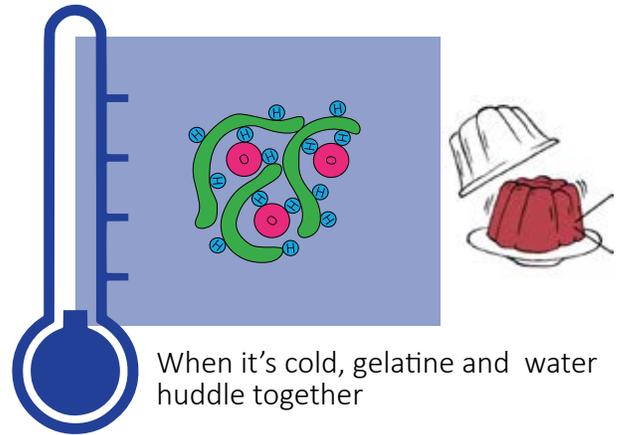


Gelatine is like strings and water is like glue. If you dip pieces of string in glue, they're going to get all stuck together.

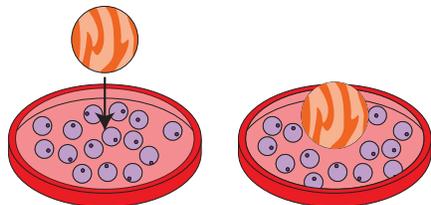
Why is gelatine liquid when hot and jiggly when cold?



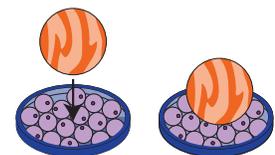
When it's hot, the gelatine and water like to spread out, just like you don't want to sit too close to your friends when it's hot out



When it's cold, gelatine and water huddle together



If you have a big cup with 16 beads in it and you placed a marble ball on top, the beads would roll out of the way and the marble would touch the bottom.



If you have a little cup with 16 beads in it and you placed a marble on top, it would sit on top of the beads. If the beads are close together, they create a table-like surface.