



How Fast Does It Dissolve?

Substances that **dissolve** in water are called **soluble** substances. Substances that do not dissolve are **insoluble** substances.

We know that substances such as salt, sugar and instant coffee are soluble. Let's take this knowledge further and consider how quickly each substance can be dissolved. What factors might affect this?



Does the temperature of the water change how quickly a substance dissolves?



Does the speed at which it is stirred have an effect?



Will the amount of substance affect how quickly it dissolves.



Does it matter how big the particles of a substance are?



Let's Investigate

We will be conducting two experiments. The first will aim to discover if the size of the particles being tested makes any difference to the time it takes a substance to dissolve. We will be testing:



Rock sugar crystals



Grains of granulated sugar



Dust-like icing sugar

Prediction:

I predict that the larger the particles the it will take the sugar to dissolve. The smaller the particles the it will take to dissolve.

I think this because

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The second experiment will aim to discover how the temperature of water – **hot** or **cold** – affects the dissolving times of these three sugars.

I predict that the sugar will dissolve faster in the water.

I think this because

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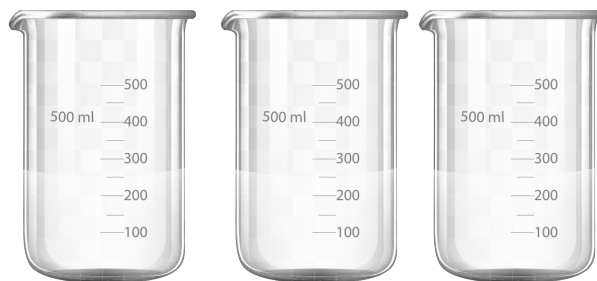
We will need to keep all other variables **the same** to make it a **fair test**.



Let's Investigate

Equipment:

- 3 transparent beakers
- A teaspoon
- Rock sugar crystals
- Granulated sugar
- Icing sugar
- Digital weighing scales
- A stopwatch or phone
- 3 small bowls
- A partner to work with



Method:

1. Fill the three beakers with the same amount of cold tap water.
2. Using your digital scales, measure 10 g of each type of sugar and place it in a bowl.
3. In partners, decide who will take on the role of stirring the mixtures and who will time and observe the experiment.
4. In one beaker, stir in your rock sugar crystals with a teaspoon, counting one full stir every second. Start the timer as soon as the sugar enters the water and observe. Stop the timer when all of the sugar has dissolved. Record how long it took.
5. Repeat Step 4 with the granulated sugar and icing sugar.
6. Repeat the whole test three times to ensure your results are as accurate as possible. Make sure you refresh your water each time.
7. Now, replicate this whole process, but this time use hot tap water. Be careful when working with the hot water. You will need to fill the beaker with hot water just before you put the sugar in each time to make sure the temperature of the water is the same for each test.



Results:

Type of sugar	Time it took to dissolve in cold water (seconds)			
	Test 1	Test 2	Test 3	Average (add all times together and divide by 3)
Rock sugar crystals				
Granulated sugar				
Icing sugar				

Type of sugar	Time it took to dissolve in hot water (seconds)			
	Test 1	Test 2	Test 3	Average (add all times together and divide by 3)
Rock sugar crystals				
Granulated sugar				
Icing sugar				

Conclusion:

My results show that... ..

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What questions do you have about how substances dissolve? How could you investigate this further?

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