

WEEK 18 - SETTING UP EXPERIMENTS



Science in the News



Sometimes hot water can freeze faster than cold. A new experiment based on tiny glass beads may help explain why.

Credit: ARTISTEER/ISTOCK/GETTY IMAGES PLUS



★ Try it at home - Lid on or off?

What do you need?

- [An adult to help you](#)
- Green beans, peas or broccoli
- A saucepan with a lid
- Scales and a measuring jug
- Access to a cooker
- A timer
- A bowl

What am I learning?

Your task is to devise and carry out an experiment to test whether cooking green vegetables with the lid on or off makes any difference to their colour. You will need to take care to make the experiment a fair test by thinking about which factors you should keep the same and which you should change in each experiment. If you want to learn more about the science behind this, check out our lesson on our website - [Science Creates Outreach](#)



Parents:

For primary learners, work through our full 'setting up experiments' lesson with your child. It is based around the national curriculum learning objectives found in the KS2 'working scientifically' section. Download here - [Science Creates Outreach](#)

For secondary learners, the contents can be discussed in more depth using the [original online article](#).

An experiment was recently conducted that suggests hot water can actually cool faster than cold water. Think about that, it's very strange, isn't it? This is an idea that people have thought may be true for a while, but until now, there hasn't been a fair enough test to prove it. The idea has come from an observation by a lot of scientists that hot water often freezes faster than cold water.

From this observation, an experiment was set up. Instead of a liquid, miniscule glass beads were used, this was so that each bead was sure to be the same size. Half the beads were heated to a high temperature and the others to a medium temperate. From here all the beads were cooled in the same way - in a bath of water. These measurements were repeated 1000 times! The very accurate instruments used to measure the time taken and the temperature of the beads consistently showed that the hotter beads took less time to cool down than the colder ones.

This was a simple study but by using controls, repeating measurements and using accurate equipment to measure, they were able to make a fair test and find out something very bizarre! If you want, read the original article with an adult to find out why this happens.

Instructions:

1. First, write a detailed list to show how you are going to make this experiment a fair test. Things to think about: amount of water in each pot, type of vegetable, temperature, cooking time etc.



2. Next, measure out half of the vegetables and put in a saucepan.

3. Then, with an adult, put the kettle on, measure your boiling water out and pour over the vegetables. Put the lid on and set your timer for around 4 minutes.

4. When the timer goes off, drain your vegetables (you can use a strainer or the saucepan lid for this). Leave in a bowl.

5. After that, repeat the experiment with the other half of the vegetables but without putting the lid on.

6. Finally, make a careful observation of your vegetables. Is there a difference? If there is a difference, could there be another reason why?

Top tip - Time your experiment just before teatime so you can eat all the vegetables you have cooked!



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V K N R T U M H C V A I G D P
 E Y W A S A B G O G E J T E V
 C X B N R Q J I N T Q O K S U
 S L P G P V H O C R M W O I Q
 E N A E C R T Z L R I A F N V
 J I O Z R E E W U L S J J A R
 D Z D I V I T D S T N Y R G E
 S D W U T X M T I P D I R R C
 E J Y C T S K E O C A U E O O
 Y Q T M S O E N N B T U F A R
 Q F T H F I B U L T R Q W P D
 X P H M D Q Z E Q D S E O J V
 T G N W C V S C O M P A R E Z
 L D X N M F T N E M P I U Q E
 I S Z U S H H A U X Z O Q F R

Compare
 Conclusion
 Diagram
 Equipment
 Experiments
 Fair
 Organised
 Predict
 Questions
 Record
 Table
 Variables

Read, Watch, Ask



Have a read of our [lesson](#) to learn more about fair tests.



How do you make sure a test is fair? Watch [here](#) to find out.



Got any questions about today's topic? Email us at info@sciencecreates-outreach.co.uk and we'll answer them!



Did you know?

The Royal Society of Chemistry is an organisation advancing excellence in the chemical sciences. [Watch this inspiring video to learn more!](#)



Be Inspired...

In this section we interview inspirational members of the Science Creates science community so that you can learn more about different jobs, what they involve and how you can do the same! This week we interviewed Andy from a company called Rosa Biotech.

What does Rosa Biotech do?

Rosa is developing a new type of sensing technology that tries to mimic the way a dog's nose works. We want to use this approach to detect diseases like alzheimer's more quickly than current techniques. This would enable people to get better treatment and would help save the NHS money.

What is your job title and what do you do?

I'm the CEO so I lead company operations, manage the staff and work to develop new partnerships with doctors and other companies. My job is very varied. One day I'll be presenting at conferences, the next I'll be writing research proposals and the day after I'll be reporting to the company's Board.

Do you like your job? Why?

My job is great. I get to meet lots of really interesting and knowledgeable people. I really enjoy helping to design new experiments and working with them to understand how we can apply the sensor to real-world problems like disease diagnosis.

How did you get your job?

I did A-Levels, an undergraduate degree and then a PhD. During my PhD I realised that what I loved was the process of turning science into new applications rather than doing lab work. I spent a lot of time reading inspirational books on this and did a few other jobs before I was ready to take on the job I have now.

Have you always wanted to be a scientist?

I always loved science and David Attenborough documentaries got me really excited about biology.

rosa
biotech

