the Big Science Event at home!

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What's the Big Science Event at Home all about?

At Science Oxford, we know that enabling children to create, plan and carry out their own science investigations increases their enthusiasm for science. We love to engage families and children with activities which help everyone to see that science is a creative process and not just following a set of instructions to get the 'right' answer.

We also work with teachers because child-led investigation is part of effective teaching and learning of scientific enquiry and increases the scope for science to be used as a basis for cross-curricular work and for the development of writing and mathematics skills.

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We've run the Big Science Event for schools across Oxfordshire and Buckinghamshire since 2009. Last year, 16,000 children took part from 94 different schools. All age groups from nursery through to year 6 are eligible, and the winning teams from every school are visited by trained judges. A grand final celebration event is held for each county at the Science Oxford Centre, where children enjoy a day of hands-on science and share their investigations with our judging panel.

This year, due to COVID-19 we have had to cancel the Big Science Event for Schools. However, thanks to support from the Evolution Education Trust, we have launched the Big Science Event at Home so that it is still possible for children to enjoy doing science whether they are at home or at school.

So, let your children surprise and delight you with those questions that you would never think of and let them show you what they are really capable of achieving! This guidance is designed to help you but if you have any further questions please get in touch via competition@scienceoxford.com

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What the children said....

"I didn't really enjoy science before. I like to choose what we do; it's more fun. Usually we are set an investigation and have to follow instructions. Now we can enjoy the mystery of not knowing what will happen."
11-year-old

"The best bit was doing something that other people wouldn't have thought of."
9-year-old

"I thought science was about answering questions and remembering stuff and I didn't feel good at it. Now I know it's about having fun and discovering new stuff."
10-year-old

"Now I know you can do an experiment with normal stuff. I thought you could only do science with special equipment."
10-year-old

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Sounds good but how do I support my children & make it manageable?

Many parents and teachers may be understandably cautious about allowing children to develop their own ideas for science investigations. They have a tendency to be inspired by topics such as acids, explosions, air cannons and aeroplanes! There are ways in which parents and teachers can facilitate the process so that it is safe and manageable, without stifling their children's creativity.

Here are our top tips:

1. Ensure that children take responsibility for planning their investigation.

Thinking about how they will set up their investigation and what equipment and materials are available helps them to work out whether the idea is a good one. Older children can consider how they will keep it safe, what they will measure and how often, how they will keep it fair, how much time it will take and how they will record and display their results; this discipline will weed out some of the less practicable ideas.
See our Investigation planning and Risk assessment sheets.

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2. **Remember that chemicals are all around us**
We use (and eat) them all the time. If children want to do an investigation with 'acids' for example, this could just mean working with lemon juice, vinegar or fizzy drinks. If something might be messy, they can consider doing it outdoors.

3. **Decide on a topic and ask children to suggest investigation questions that fit the theme.**
This could be a science-related topic such as 'light' or 'leaves', or perhaps they already have a topic started at school such as 'islands' or 'volcanos'. Alternatively, you could ask children to think of investigation questions linked to a particular occasion, such as a sporting event or a birthday party.

4. **Suggest an activity but allow children to think about what they could change and measure**
They can explore it further in a way that interests them. Have a look at our Activity ideas in the resources section or look at our Science Oxford Challenges . You could also watch one of the Royal Institution's ExpeRimental videos.

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5. Suggest a question to consider, but allow children to design their own investigation in order to try to answer the question.
For example, which brand of ketchup is the runniest? Or which liquid evaporates the quickest? This approach can also be managed by limiting the range and quantity of materials and equipment available, especially consumables (all scientists have to work with this!). See our Investigation question ideas in the resources section.

6. Talk to them and ask questions (but don't do it for them)
Children are naturally curious and will have fantastic ideas of their own, and it is rewarding to encourage them to take ownership. You can support them and the development of their enquiry skills by talking to them and asking questions; you don't need to know the answers! How can they make their idea fit with what it is possible to do? How can they make it safe? What are they going to measure and how? Why is it a good idea to repeat their tests? How are they going to remember what they have done and what happened? Why did that happen? How can they be as sure as they can that their conclusions are correct?

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What do we do if their investigation doesn't work?

The most important thing to remember is that the Big Science Event at Home is about doing science and developing thinking and enquiry skills more than anything else. We want children to understand that science is a process of discovery that anyone can do, it's not just about 'knowing stuff' or getting the 'right answer'.

Carrying out an investigation isn't all about the results; the process of doing it is important in its own right. Explain to your children that this is what science looks like and feeling that you haven't been able to fully answer your question, or that something didn't work as planned is part of being a scientist. We usually learn more if things don't work or don't give us the answers we expect. Our judges will be most interested in the children's thinking, so being able to say how they would improve it next time is just as valuable as a set of clear results and conclusions!

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What counts as an investigation?

When children do science at school there are five 'types' of science enquiry that are included so that children learn how to use a variety of approaches to answer scientific questions. Any of these approaches can be used as part of the Big Science Event at Home. They are:

1. Observation over time

If children want to see how something changes, they can watch carefully and record what happens. This might be over seconds, minutes, hours, days, weeks, months or even years, although there's obviously not enough time for the last couple of those in this year's Big Science Event.

Questions that need such an approach might include: What do they notice when condensation forms on a glass filled with ice when placed in a warm place?; What happens to a shadow over the course of a day?; What happens when a plant is grown in different places? How long does it take for a grape to turn into a raisin?

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2. Identifying, grouping, classifying:
This is about children trying to sort and make sense of everything around them. Children might, for example, collect different types of leaves, or different materials around the home and classify them into different groups according to what they look like, how they feel or what they are used for.

Questions that need such an approach might include: Which materials will float and which will sink?; How can we sort the food we eat?

3. Collecting data and pattern seeking
Pattern seeking is about collecting lots of data, and looking at it to see if a pattern can be found. This is great if it's not easy to separate out what you're looking at and control an experiment and this type of investigation could involve carrying out a survey with as many people as possible, or looking at all the plants in a garden.

Questions that need such an approach might include: Are people with blue eyes more likely to need glasses?; Do plants grow better in the shade or the sun?; Does the size of your ear affect how you hear?

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4. Making comparisons and carrying out a ‘fair test’

These are similar approaches to a question that needs someone to actively experiment to find out the answer. There’s not a clear distinction between a comparative test and a fair test, but in general it’s considered that carrying out a fair test first requires children to identify things they can change about an experiment (‘variables’).

In a fair test one variable is changed, while all others are kept the same, and then the impact of changing that one variable is measured in some way. For example, they might investigate which paper spinner falls the quickest by changing only the type of paper, while keeping everything else the same.

A comparative test is simpler and more suitable for younger children – for example, comparing which tissues are best at soaking up water, without fully controlling for all the variables of those tissues, such as their thickness.

Questions that need such an approach might include: What shape parachute will take the longest to fall?; Do you run faster swinging your arms or normally?

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5. Research

This involves finding things out from other sources, such as books, TV, photographs, the internet, and critically evaluating them, rather than doing an experiment.

Questions that need such an approach might include: Why are some animals nocturnal?; What would the different planets in our solar system be like to live on?; Which breed of dog can smell the best?

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What should children include in their poster, slides, written report or video?

We've made the Big Science at Home as easy as possible to enter so there is no set format for how to share your investigation with us. Children can use whichever medium they choose such as a poster, video, slides or a written report. Whichever format they use, encourage children to answer questions like: What did you do? What did you think would happen and why? What did you find out? What surprised you? What worked well, or didn't go to plan? What would you do differently? See our Frequently Asked Questions section for more information.

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Enter the Big Science Event at Home

When you've finished your investigation, fill in our online form and upload your results:
scienceoxford.com/big-science-event-at-home

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If you have any questions, just email us on:
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