Who are CHaOS?

CHaOS (Cambridge Hands-On Science) is a non-profit student voluntary group at Cambridge University.

Our events consist of short hands-on experiments for children of all ages to try. Each experiment is staffed by an enthusiastic and knowledgeable student demonstrator who guides small groups of children through the experiment, explaining it in an interesting way that is suited to their level of understanding.

Our experiments cover a wide range of interesting and sometimes surprising science, for example explaining why hot air rises, how different types of bridge work, how your fingers move and how electricity is generated, to name just a few!

CHaOS has been demonstrating hands-on science for more than 10 years, and we design and build most of our own equipment.

Every summer we run a roadshow, organised by a small group of volunteers, taking our hands-on experiments and demonstrators to a variety of locations around the country. We visit towns that, unlike Cambridge, have few science events, and therefore hope to reach children who wouldn’t otherwise experience science outside of the usual school curriculum.

While on tour, we stay in tents and live out of a minibus, a van and a car. At CHaOS events demonstrators wear characteristic blue t-shirts, making us easily recognisable!

This report describes our seventh roadshow, which took place over four weeks in July 2008 and involved 33 volunteer demonstrators.
The 2008 CHaOS roadshow went to schools, public venues and festivals.

We took our hands-on experiments and demonstrators to Devon, Hampshire, Herefordshire, Gloucestershire, Wiltshire, Kent, Essex, and Suffolk over 4 weeks in July 2008.

The start of the roadshow corresponded with the last few weeks of school term, so on weekdays we visited schools, and public venues at weekends.

At schools, we see multiple classes throughout the school day to fit in with the school timetable. At public venues, we usually set up in the morning and run our events from 12-5 pm.

The last week of the roadshow was after the end of school term, so we ran a variety of public events before ending our tour at the Gloucester festival. Last year, flooding prevented us from going to Gloucester, so it was great to be able to take the roadshow there this year in the sunshine.

The roadshow route…
Tuesday 1st July: Teign School, Kingsteignton

The tour began in Kingsteignton in Devon. We spent the night in the Sixth Form common room at Teign, which meant we had plenty of time to make sure all the kit, including the big new darkroom, was working. We then spent the day with the school’s Year 7’s, as well as Year 6’s visiting for their induction day.

Learning about electromagnetism

Wednesday 2nd & Thursday 3rd July: Teignmouth Community College

Spending two days at Teignmouth Community College so that we were able to see all the school’s Year 7-9 pupils as well as Year 5 from two local primary schools. The new video attachment for our microscope enabled everyone to see cell structures and take a closer look at the cast-off skin from one of the snakes living in the lab!

Saturday 5th July: St Augustine’s Centre, Folkestone

The rain that greeted us as we got up at our campsite cleared and a beautiful afternoon meant that as well as looking at sound, bodies and electricity in the hall at St Augustine’s centre, visitors were able to build bridges and investigate the texture of cornflour in the play area of the neighbouring children’s centre.

Building bridges outside…

Mini explosions with lemon juice!

“Great fun - I’m sure it will encourage more children into science”
Sunday 6th July: Whitstable Umbrella Community Centre

A return visit to a place where we had been well-received in 2005 saw a good visitor turnout. The community centre stage provided an excellent location for our darkroom experiments looking at light, although the rain made us move the bridges indoors part way through the afternoon!

Tuesday 8th July: King Edward VI Grammar School, Chelmsford

CHaOS’s arrival at KEGS was greeted by torrential rain and hail, but that didn’t stop us running two labs full of experiments for Years 7 and 8, as well as Year 5 from nearby Cathedral Primary School. Boris, our skeleton, was the star of the occasion as always, with the local newspaper coming in for a photoshoot.

Wednesday 9th July: The Campion School, Hornchurch

After some brief navigational difficulties, CHaOS found its way to the Campion School, where we ran 6 hours of experiments for Years 7 and 8. The new paper-breaking machine got its first full outing at a school, surprising pupils and teachers alike with just how strong paper can be!

“Biology was extremely interesting, I learned loads. Thanks”
- Liam, age 13
Thursday 10th July: Emerson Park School, Hornchurch

We visited Emerson Park as part of their Science and Technology day, running experiments for Years 7 and 8. Year 5 from Nelme Primary also came to join in. A conveniently placed skylight gave plenty of room to fly hot air balloons, while in the other lab our resonance experiment was being compared to a video of a collapsing bridge on YouTube!

Saturday 12th July: Stowmarket Carnival

A return visit to Stowmarket Carnival meant we met up again with some of last year’s visitors. It was encouraging to find how many experiments and explanations were recognised, and with how much enthusiasm!

Sunday 13th July: Felixstowe Leisure Centre

After spending the night in Stowmarket, we headed further eastwards for an event in Felixstowe. Our location (a leisure centre right next to the promenade) meant there were lots of visitors during the afternoon, drawn in by the explosions and cornflour outside the door.

Tuesday 15th July: Trosnant Junior School, Havant

Some nice weather at last gave us a chance to spread outside with water rockets and the suspension bridge. We were visited by Years 4, 5 and 6, and at the end of the day, we ran a highly successful session for the EBD unit attached to the school. Many thanks to Year 4 for sending us some excellent reports on the experiments they did!

“I really enjoyed the day. I thought it was fantastic”
Wednesday 16th July: Park Community School, Havant

An impressively complicated timetable allowed us to have short sessions with almost all of Years 7, 8 and 9 at Park Community. We converted one lab into a darkroom, but still had space for lots of other experiments, with the bubble column making its first appearance of the year.

Thursday 17th July: Warblington School, Havant...

Six of the CHaOS team visited Warblington as part of their Science Day, with lots of exciting science events going on all over the school. We were visited by a mixture of pupils from Years 7-9, as well as a group from various other local schools, and a steady influx of teachers and VIPs from the local area.

… & St John’s Cathedral Catholic Primary, Portsmouth

The other half of the roadshow headed further down the A27 to visit a small primary in Portsmouth itself. The pupils at St John’s met Boris, and thoroughly enjoyed finding out how to make mini explosions from kitchen ingredients.

Saturday 19th July: Corsham Community Centre

We arrived at Corsham Community Centre to find the town fair setting up on the neighbouring park, so after a brief discussion with the fair’s organisers, we arranged to set up some of our experiments next to the knitwear stall. The arrangement worked well for everyone, especially when the mid-afternoon downpour meant that visitors could combine sheltering from the rain with learning some science.

Sunday 20th July: Ridgewood Community Centre, Chipping Sodbury

At the Ridgewood Community Centre, visitors examined the physical properties of cornflour, the electrolysis of water and what happens when you mix lemon juice with bicarbonate of soda, in a sunny paved courtyard. Indoors, gases, body parts and air streams kept some families busy all afternoon.

“It was really cool with all the different activities. Also the people and organisers were really friendly. Thanks!”

Discovering vacuums

Many experiments in action!

Earthquakes
Tuesday 22nd July: The Subscription Rooms, Stroud

An exceptionally hot day didn't dull the enthusiasm of the children of Stroud for learning exciting new things about science, or for playing with the cornflour, which ended up distributed liberally around the building. Outside, visitors enjoyed making explosions with lemon juice and bicarbonate of soda, and also with the hydrogen and oxygen mix made by splitting water.

Wednesday 23rd July: Market House, Ross-on-Wye

Perched at the top of the High Street, and underneath the Heritage Centre, the covered market at Ross-on-Wye was the ideal location to catch families on their way past. Once inside, they could spy on the High Street using our camera obscura, learn about the body, and find out how much air weighs by doing our vacuum experiments. We were busy right from the start, when lots of children from the local Kids' Club turned up to investigate what was going on.

Thursday 24th July: George Watson Community Hall, Tewkesbury

We had lots of enthusiastic visitors to our event at the George Watson Memorial Hall in Tewkesbury, where we had turned the stage into an impromptu dark-room full of lots of experiments explaining the physics of light. Elsewhere, kids could learn, using our spinning chair, how ice skaters speed up when they pirouette, and could discover the science behind sound by singing at our oscilloscope.

Saturday 26th & Sunday 27th July: Gloucester Festival

We finally made it to the Gloucester Festival, after flooding forced its cancellation last year. Blazing sunshine all weekend encouraged lots of families to head to the park and our rainbow-striped tent was constantly bustling, with crowds of visitors wandering in to find out what we were up to and staying to have a good look at everything from the camera obscura to the suspension bridge.
CHaOS is science at three pounds a head!

At our school events CHaOS reached around 2600 children, with each spending about an hour exploring our hands-on experiments under the guidance of our demonstrators. Our more family-oriented events at weekends and during the final week of tour saw an estimated 2500 people. This makes a total of over 5000 visitors for our 2008 roadshow!

By dividing our estimated expenditure by our total number of visitors, we calculate a cost per visitor of just under £3 per head. This is much less than the cost of a conventional science museum visit.

The costs of the CHaOS roadshow are met by our sponsors and small contributions from the schools that we attend, meaning that our events are free to the people who attend. This, and the locations that we choose, make CHaOS science accessible to everyone.

Visitor feedback

At our public events, CHaOS distribute voluntary questionnaires to visitors to gauge their opinions about our experiments and demonstrators, and also to find out a little about the demographics of the people who attend our events. The responses to these questionnaires show that CHaOS is overwhelmingly well-received by our visitors, who learn a lot whilst enjoying themselves at the same time!

We collected 184 questionnaires which reflect the experiences of 573 people attending our public events during the 2008 roadshow. No data collection was carried out at our school events, however feedback from the teachers and children involved has been very positive.

Who visits CHaOS roadshow?

Analysing the responses to our questionnaires shows that most people attend CHaOS events in family groups, with adults making up around 30% of the visitors.

The majority of our visitors travel a short distance to CHaOS events, although around 10% of people responding to our questionnaires had traveled for more than half an hour.
CHaOS has shown that we have a cost-effective and successful model for science communication. Demand for CHaOS visits to schools and other locations, especially from those who have seen us in action, is continually growing and vastly exceeds the number of events we can run in a year.

Planning for next year’s roadshow will begin with the new academic year. If you are part of, or know of, an organization that could help provide CHaOS with the funding we need please contact us by e-mail for more information about our plans:

contact@chaossscience.org.uk

If you can suggest a suitable venue for a CHaOS event, whether a school, festival or local venue, we’d love to hear from you, too.
Thanks to our volunteers…

Andrew Chapman
Angela Bradbury
Bryony Parrish
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Ralph Bird
Rebecca Howe
Rosy Hunt
Sabine Crevoisier
Sarah Dowding
Sheila Lumley
Tamaryn Godinho
Thomas Ling
Thomas Williams
Valerie Brandt
Zhou Fang
Thanks to our sponsors…

For our events in Folkestone and Whitstable:

![Pfizer Logo]

For all other events in the 2008 CHaOS roadshow:

![University of Cambridge Logo]
![IOP Institute of Physics Logo]
![Microsoft Research Logo]
![GlaxoSmithKline Logo]
![MRC Medical Research Council Logo]

…and also to

Vanessa New and Jackie Burl at Teign School, Kingsteignton
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