Feature: Science Tour 2003

Transportation

Dr Bones’ Day Out
What We Did In Our Holidays

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Abstract
A study was carried out to investigate the reactions of various members of Homo sapiens sapiens, to scientific concepts presented in a manner that utilised the knowledge of proactive student scientists and interactive, cross-disciplinary[1] experimental procedures. These included causing the explosive failure of various pressure vessels[2], the levitation of sports equipment[3], and the creation of turbulent buoyancy features in a Newtonian fluid[4]. The study was transported over approximately 1.69×10^-10 light years visiting 11 dispersed municipalities by means of white commercial vehicles. This appears to have resulted in the amusement, enthusing and possibly even education of over 1500 members of the general public.

INTRODUCTION
We are a voluntary student group based in Cambridge that believe science is fun and relevant to all. Hands-on experiments are a great way of getting this across to people. Small groups are guided through activities by a demonstrator, so that visitors do more than just play with the experiments. We developed this approach for our National Science Week event called Crash, Bang, Squelch! (CBS), which is now in its sixth year. In 2003 it attracted at least 3000 visitors of all ages in just 6 hours! Being a major university town, Cambridge has many science events. Having grown up in provincial towns where nothing scientific ever happened, we decided to take the spirit of CBS further afield. Hence the CHaOS Science Tour was born.

Fig 1
Cornflour usage; Sleep of subject A; Sleep of subject B

Fig 2 Crash Bang Squelch!
In 2002 we visited 6 venues along the South Coast, with up to 9 student demonstrators and 20 experiments, over a week and received a fantastic response from the public. This year we decided to build on this success with a bigger, better, longer (and generally more knackering) tour. It lasted 2 weeks, included over 30 experiments, involved 17 demonstrators, travelled over 1000 miles and visited 11 venues between Grimsby and South Devon.

I really like the interesting things here and learning things I never new before. Its very fun I would give it 100/10.

Lauren, age 9

Our events consisted of a hall packed full of experiments, with student demonstrators to guide visitors through each. People were enticed into the event by messy and wet experiments outside, such as exploding film canisters powered by bicarb. and lemon juice, that were so powerful in Swanage we attracted police attention (we managed to convince them it wasn’t a terrorist threat). Once inside visitors enjoyed taking a turn on the spinney chair learning how ice skaters pirouette and satellites steer. Then tried extracting DNA from kiwi fruit or looking at mini-beasts under a microscope. On entering our portable dark room they found

Cantilever bridges

EXPERIMENTAL METHOD

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themselves in a giant camera, traced the way their eye works, saw how a white sun makes a blue sky, played with twisted light and invisible colours then turned their friends into ghosts with sheets of glass. Other popular activities were building and walking across the arch bridge or taking the CHaOS tower challenge. Glow sticks and dry ice helped to explain how temperature affects chemical reactions and why our locusts were lazy in the cold. Visitors were keen to meet our friendly skeleton Boris in his boudoir where they listened to their own heart, investigated a working model of the arm and discovered some gruesome diseases.

"I got filthy and wet. I fell off something. I had a great time."

We would arrive in town late at night, erect tents in darkness and wake at the crack of dawn, to begin setting up the event. Between 9am and midday each venue went from complete chaos to comparative order as we set up, while Boris lead advertising expeditions into town. The event then ran for 5 hours attracting many and varied visitors.

After the event, we faced the task of returning the chaos to whence it came (a large white van), and then travelling to the next venue.

**APPARATUS**

Our experiments were begged, borrowed and built over the summer. The team diligently instituted a "skip watch" throughout the university. This gained them 17 drawers, 3 desk tops, a bubble column, a 2m Perspex tube, 2 centrifugal fans, and much, much more. It was the building that was responsible for the most sleep deprivation, most of which occurred in Dave's living room, that thanks to much hoovering and judicious bribes
he is still occupying. After 3 weeks we had built...
• A camera obscura
• 2D lenses and ray boxes
• An earthquake model complete with falling towers
• A sunset model
• A water rocket launcher
• A bubble column
• A 4m flat pack, self assembly wooden suspension bridge
• A 3m x 7m dark room made from landscaping fabric
• A working 2½ times scale model of a forearm complete with tendons and joints
• A beach ball blower

Results

An estimated 1500 people attended our events in total. Questionnaires were filled in by 150 groups (amounting to at least 400 people) and the feedback was incredibly positive.

• 99% of visitors had an enjoyable time and 79% had a very enjoyable time
• 97% learnt at least something and 79% claimed to have learnt a lot
• 62% of visitors were from a non-scientific background
• 67% of visitors visited science museums and exhibits once a year or less
• A staggering 95% of visitors would come again

“Excellent day – we’ve spent 4½ hours here!”

Flat pack suspension bridge

We also made use of and improved experiments built for previous events, such as cantilever and arch bridges, railway tracks and a fluidised bed.

Locusts, dry ice and glow sticks

Gyrosopes in a 17th market
The written comments were also fantastic, with the only major complaint being a shortage of advertising.

17% of our visitors came as a result of reading newspaper articles and another 12% received leaflets at school, but the largest group (25%) simply walked past our venues, which meant that choosing the right venue was vital. It is quite difficult to explain what we do in a small leaflet so newspaper and radio interviews are important.

**Great for grow ups too!!**

**CONCLUSION**

The success of the tour was probably due to a number of factors, not least that the style was very personal. Visitors ranged in age from toddlers to OAPs. If a parent understands something then they can always pass it on to their children when they are ready to learn, so adult education is also very important to us. Quite often teenagers were reticent while younger children were about, but would descend as we started packing up. One such character remarked he would pay attention in science lessons from now on.

We are now starting to plan next year’s tour, although there are disagreements as to where CHaOS should descend next year.

**Excellent - even better than last year if that is possible!**

*Head of Science, Kingsbridge*
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