

# Norwich Science Olympiad 2010 Evaluation of Final Day Events 29th and 30th June



Submitted August 2010:  
Dr Teresa Belton  
t.belton@uea.ac.uk



# Norwich Science Olympiad 2010

## Evaluation of Final Day Events

### Contents

Executive Summary.....	5
Introduction .....	5
Evaluation of Final Day Event for Primary Schools .....	5
Evaluation of Final Day Event for Secondary Schools .....	10
Appendix 1	
Primary school teachers' and accompanying adults' questionnaire responses.....	13
Appendix 2	
Primary school pupils' questionnaire responses.....	18
Appendix 3	
Secondary school teachers' questionnaire responses .....	28
Appendix 4	
Secondary school students' questionnaire responses .....	29



# Norwich Science Olympiad 2010

## Evaluation of Final Day Events

### Executive Summary

Both the Primary and Secondary schools' Final Day events generated considerable engagement and enthusiasm among the participants, and resulted in a significant increase in their interest in science. The demonstration lecture on the Primary day was a particular highlight. The principal benefits of both events were the opportunities they provided or inspired for practical hands-on experiments, of which the students have little experience at school. Participants especially enjoyed being challenged to think tasks through for themselves and being able to work in teams. Some suggestions were made for minor organisational improvements.

### Recommendations

It is recommended that the Norwich Science Olympiad Final Day events for primary and secondary schools are repeated, and that the lecture on each day includes a significant element of audience participation. The organisers might like to consider making the events slightly longer, allowing more time for breaks and for moving from one activity venue to another. Clearer instructions and geographical directions for each group to follow to reach activity destinations would also be helpful.

### Introduction

The format of the 2010 Olympiad Final Day events was the same as that of the 2009 events: for both Primary and Secondary schools it consisted of practical activities, some of them competitive, and a lecture. The approach to the evaluation of the events was also the same: questionnaires were distributed to every participating pupil and accompanying teacher and other adult, and focus groups were held with Olympiad participants in a particular year-group in each of six schools a week or so later; this year the focus groups were carried out with pupils in Years 4, 6 and 9. The way in which the evaluation was organised was the same as in 2009 and details of arrangements were as described in the 2009 evaluation report.

### Evaluation of Final Day Event for Primary Schools

Twenty-eight primary schools registered to bring a total of 408 pupils, in groups of four children per year group, from Years 3 to 6. The event was booked to capacity, with a short waiting list of schools. Competitive tasks, or "challenges" set for pupils (some to be carried out in pairs) were:

- To make an accurate 3-D model of an insect, ie, with all body parts and in proportion, after watching a brief demonstration, using sugar paper (Year 3) or card (Year 6) and stapling together.
- To discover what minibeasts live in the University broad and what special features they have that enable them to live in water.
- To make a pop-up toaster out of materials provided, eg, shoebox, string and rubber bands, and see which would ping the toast up highest, having looked at a prototype.
- To make a device for weighing eggs using materials provided, eg, cereal box, margarine tub, plasticene and spring
- To make a sand timer using sand, acetate sheet, plastic cups, wooden sticks, etc. which would time for 30 seconds and allow the moving sand to be seen.

In addition, pupils also either made square bubbles, took part in a computer quiz or isolated their own DNA from their cheek cells. During the course of the DNA experiment there was an explanation of what DNA is and of the steps involved in its isolation. The children were able to take their own DNA home in a necklace. (All samples remained anonymous and any left over were disposed of).

The demonstration lecture, seen by all the children, was called Chemistry with Cabbage, and was given by Lorelly Wilson, who showed a series of simple experiments using household chemicals. These are described on the website <http://www.lorellywilson.co.uk/>.

### Questionnaire responses

Completed questionnaires were received from a total of 14 schools, from 126 pupils and 17 teachers and other accompanying adults. This compares with questionnaires from 17 schools, 157 children and 24 teachers other adults in 2009. The teachers' and other adults' responses conveyed great enthusiasm for the event among the pupils they accompanied and a desire among many of the children to do more of these activities at school. Apart from a few minor suggestions for logistical refinements to the event, the adults were also very keen, communicating what a stimulating experience it had been for the children. Their responses in full can be found in Appendix 1

The pupils were overwhelmingly positive in their responses. These are shown in full in Appendix 2. The questionnaire was designed to discover whether they found the day enjoyable, whether it increased interest in science and technology, and if and why any activities were particularly enjoyed or not enjoyed. The responses gave a clear message that the Final Day event generated a very high level of enjoyment and engagement, and an increased interest in science for the great majority of children.

Table 1: Summary of the impact of the Primary Final Day event (total=126)

	Yes	No	Y and N etc
Did you enjoy the Olympiad Final Day?	125	0	1: "bits of it"
Before the Olympiad were you interested in science?	116	9	1: "a little"
Has taking part in the event made you more interested in science	121	5	0

Are you looking forward to learning more about science at school?	120	2	2: "kind of", "yes and no"
---	-----	---	----------------------------

### Commentary

These figures demonstrate that the Primary Final Day event was enjoyed by every participant. Most of the children selected to participate were already interested in science, and the questionnaire responses indicated that those who were not particularly interested in science beforehand were all more interested in it as a result of taking part. It can be assumed from the pattern of responses that those children who said that the day had not increased their interest were those who were already very interested: it would be fair to say that their level interest was maintained by the event.

### The most enjoyed activities

The questionnaire asked pupils which activity or activities they particularly enjoyed; the overwhelmingly most popular element of the day was the "Chemistry with Cabbage" lecture, during which twenty-five simple experiments were demonstrated. This was the single activity that every participant experienced and was named 54 times. Other well-received activities were those involving bubbles (23 mentions), making scales for weighing eggs (14 mentions), making a "pop-up toaster" (13 mentions) and isolating their own DNA (9 mentions). Every other activity, ie, the quiz, pond-dipping/mini beasts, making a sand timer and making insect models, was also specified by a few children as one which they particularly enjoyed.

### Reasons for enjoyment

The reasons given by the children for what they particularly enjoyed fell into several broad categories:

- The challenge presented, eg, "The quiz was hard and you had to get your brain going", "It was great we could think how to make a toaster";
- Participation, eg, "I liked having a time to make completely your own design", "I like doing practical science and not just writing down so that is one of the things I have enjoyed";
- Watching, eg, "That they sho you sum science", "Whatching all the experiments";
- Fun/enjoyment/excitement, eg "And making the ants was enjoyable", "Because it was fun to make it pop";
- Learning/interest, eg, "In pond dipping I found much more than I expected", "I was really interested in chemister with cabbage because you can use stuff for chemeristy that you can buy from shops";

- Competition, eg, “and it was a bit competitive who won”, “and we won!”

Of these factors, the most often cited was the element of fun/enjoyment/excitement, and the least cited was competitiveness; all the other reasons for enjoying particular activities seemed to be of roughly equal significance for participants’ engagement. The watching element was clearly enhanced by the very visual nature of some of the experiments shown in the lecture: several children referred, for example, to the “elephant’s toothpaste” which was spectacular.

#### *What was not enjoyed*

Eighteen children said there was an activity that they did not enjoy, but the lack of a pattern amongst these suggests that this was a matter of personal taste rather than a weakness in any particular task.

#### *Suggested improvements to the event*

Asked what changes they would make to the day, much the most common suggestion made by the children was to make the day longer or to have more activities – a response which expresses commendation rather than criticism.

#### Focus groups with Year 4 pupils

One focus group was held at Wreningham Primary School, with three Year 4 pupils. They were enthusiastic about the day, and particularly about the competition they won and the “Chemistry with Cabbage” lecture. They enjoyed the practical science, even though they were a passive audience for the lecture, as these extracts from the transcript show:

K: She showed some really amazing things

R: Do you remember anything in particular from that lecture in the morning?

J: I was really amazed by the nail varnish remover..... She was just talking as she pushed it down and it was vanishing.

R: Tim, Kerry - Did you think that was good too?

T & K: Yeah.

K: I really liked the elephant’s toothpaste too.

R: The elephant toothpaste: The one that went everywhere basically?

All: Yeah!

R: Was there anything else you thought was interesting from the day?

K: I really liked everything really.

R: Oh, so it was a good day all round then?

All: Yeah.

.....

R: Would you say the kind of science you saw there that day different from the science you see here at school?

All: Yeah!

J: It was more chemistry.

K: Especially the lecture.

T: Yeah, because we don’t do experiments with like liquid and stuff .....

R: So it’s basically different because what you saw was a lot more chemistry based. And a lot more messy?

All: Yeah!

R: Excellent! Ok, did you learn anything on that day that you maybe didn’t know before?

J: I learned lots and lots of stuff at the lecture again...

R: Anything in particular?

J: How different liquids and like different chemical reactions can change amazingly; like it can change the colour of cabbage juice, and it can make things disappear.

Another focus group was held at Poringland Primary School. Here the children also noted a big difference between the science they did at school and the activities of the Final Day event. Even if they were not particularly interested in science they gained a lot from participating and would recommend it to other children:

F: Was it harder than school?

C: Yeah a bit more advanced than school.

M: It was more fun. Because school just shows you and teaches you how to do it, you don’t see it or do anything from the science unless it’s like making an electric circuit that doesn’t really work because all the batteries and light bulbs are flat.

F: So the equipment you had was good when you came to the Olympiad?

C: Yeah, so it’s like proper stuff instead of something like little. Not proper things like plastic things and stuff in school.

P: It was different from what we normally revise on.

Over and over again. We normally do the same thing, whereas this was something a bit different. More fun.

F: So do you think after going on the Olympiad you’re more interested in Science?

All: Yes

F: And why do you think that is?

M: Probably because we know what better things we can do, and we can try them out. At school, you don't really want to try out anything of the things that they do, but this was fun stuff so you actually want to.

.....

C: I would say that science isn't necessarily my favourite subject, because learning different types of rocks and magnetism isn't something I'd like to do, I'd rather day-dream or draw. But there was loads of stuff to keep you occupied. It's university and it's sort of really high level of quality and there are lots of different things and I don't think somebody could find one activity boring. It was clever how everything was done.

M: I would say even if you don't like science, it's not like school science. It's fun science and you get to try lots of different experiments. And at school, you just get to do one science experiment for like 2 months and you keep doing the same thing, whereas in that you do loads of different things and you can try it all at home instead of just trying one thing.

There were some minor dissatisfactions: the children found they got hungry and would have liked a break for a snack, and they found the competition to make a sand timer that would time exactly 30 seconds was too hard; they would have liked clearer instructions and more time in which to complete the task. But overall, their final verdict on the event was, "It was brilliant!"

### Focus groups with Year 6 pupils

At Robert Kett Junior School in Wymondam two children took part in a discussion after the Olympiad. They were very enthusiastic about the experience, although they, too, found some organisational aspects of the activities frustrating:

B: The first thing I said to my Mum when I got in the car is all the tricks with the chemistry of cabbage...

.....I didn't know that if you got polystyrene tubes and nail varnish remover, it would dissolve it, and it was quite amazing because the sheets were like, massive and it dissolved two of them, I never knew it could do that.

.....

L: Yeah, the lecture was really good - it taught us loads of things like things that we haven't really

done at school before, like egg weighing

K: That's right - what did you think of that exercise?

B & L: It was OK/good

B: But when we went to go measure it, it was a bit rushed though. They said, "Come on, move quickly, we've got like a hundred more people to go".

L: We needed a bit more time around there

B: I think it's because at the start they spent quite a bit of time showing us all the things that we'd got

L: And we knew what the weighing scales were, and we knew what the springs were and he was going on a bit about them being nice and delicate. And the kitchen scales - I think he should just, like, say what they are and demonstrate but he kind of went on a bit saying how they work and we're like well we've used them before, we know what they are.

.....

B: I liked Top Quiz, because it was, like, quite technical, and at school we don't have the chance to have the little remotes - it was quite fun because there were four schools in every team and we didn't know each other but we were still trying to, well, not swap answers, but making sure we both had the right answers to see if we were right, and I really liked it.

.....

K: Did you find that the things that you did at the University were very different to the things you do at school when you do science?

L: Yeah, quite different - like if we do weighing we usually just put something and then write it down, but this we were actually trying to make it, and I found that quite fun. Yeah, and we usually have to write down everything that we did and work it out .....This was different because we got to make everything and experiment and get results, and see who won.

B: It was quite creative, because normally

L: It was quite competitive as well, to see who came first and stuff, so we were trying to be competitive to get it the best. We got to colour in things and stick them on to make it look more presentable

.....

L: We learnt a lot in the Chemistry with Cabbage because we never do that sort of thing at school. There's a lot of things that she got from the chemist and stuff that we'd never done before and never knew. The plasticine and the big stretchy...we

don't do things at school like with the elephant toothpaste at the end - that looked really fun. We don't do anything like that.....  
And I've shown my Dad, because my Dad was away when I did it

B: It was quite cool when she did the cup trick and she poured water into cups - it was quite funny, even though we knew which one, she swapped them over. But I think it would have been a bit more involving if people got up and did tricks

L: Yeah like with each other on our table and we could all have a go

B: I liked the thing, where, because we could do the hot and the cold thing at school where she had the hot water and cold water on top, and then it didn't mix.....  
because we don't use food colouring in school - with all the stuff that she did, with the background - the black background and changing all the colours of the things

K: OK. So do you think that going to the Olympiad has made you want to do more of that kind of thing?

L: I think a little bit because we want to have a go at the things just to do it ourselves

B: It's kind of, like, the egg weighing thing; I didn't find it boring but we kind of knew what to do. It would have been more exciting if we'd done something we saw in the lecture, and had a go ourselves. Because that looked all really fun.

L: Yeah, and I'd already done that kind of stuff already, and the lecture really got me kind of interested and I wanted to know how you did this so that made me want to learn some more about it.

B: I think most of us had already done something like the eggs at school. But if we did something like the DNA and Top Quiz that would have been quite good. Maybe the day could be a bit longer so you get to do three things.

L: I think a lot of us would enjoy a longer day  
.....

B: It made me want to have a bit more of a go at science,

L: Because you're watching it and doing it is a different thing - it's quite boring just watching it.

B: We've never seen any of this before, and I'm quite interested - it didn't bore us or anything

.....

K: So the lecture made a big difference for you?

B & L: Yeah

B: It was suitable for all Years, it wasn't too

grown up or too babyish, I think we all found it quite good. Never seen anything like that before.

.....

L: I don't really like science to be honest, but I'd rather have a bit of a go at science now.

.....

B: A lot of us went home, had a look on the website and decided which one we wanted to do and a lot of us are more interested in science...we hadn't seen that before and we don't do that sort of thing at school. When I was telling my mum and my sister all about it when I got home I think they were quite interested - I want to do this to show them what I did.

Another focus group was held with year 6 pupils at Avenue Junior School in Norwich. Here three children discussed their experience. One declared the day "perfect". They were interested to discover that they could make scales for weighing an egg, but agreed that they had enjoyed the lecture best. One of the children had already decided that he really wanted to be a scientist, but felt that the Olympiad had given him "a better understanding of what you can actually do". The other two children had not enjoyed science before; this was because they didn't do many experiments at school, and normally just wrote things down. One pupil felt that the Olympiad had probably made him more interested in science and the other said it had interested him a lot. In three of the four schools there was discussion about the confusion the children and teachers had experienced in knowing where to go at various points in the day, and the need for better directions.

### Evaluation of Final Day Event for Secondary Schools

26 secondary schools registered to bring a total of 440 students, mostly in groups of five, from some or all year-groups 7, 8, 9, 10 and 12. As with the Primary day, the event was fully booked with a short waiting list of further schools which wished to attend.

Tasks included:

- Making a slide of onion cells and measuring in micrometres the diameter of a nucleus and the length and breadth of a cell
- Drawing a pollen grain from each of three different coloured flowers on separate slides and to calculate the diameter in micrometres of each pollen grain
- Finding out the concentrations of three solutions of copper sulphate and zinc
- Making a turbine propeller or windmill sail to be rotated by wind from a fan, from materials provided, and measure (with adult help) the energy it generated in 15 seconds.

The Frank Halliwell Memorial lecture, given by Tim Hunkin, and heard by all participants, demonstrated electromagnetism and its use in the design of a number of devices.

#### Questionnaire responses

Questionnaires were returned by 4 high schools, completed by 3 teachers and 44 students. However, one of the schools had been given the Primary school questionnaires in error, which means that, other than the general questions about enjoyment of the event and interest in science before and after, the responses given below are not consistently representative.

The teachers' responses suggested that the students found the day stimulating. They themselves mentioned some organisational areas that could be improved: a less rushed programme, clearer instructions on worksheets, and more information longer before the event. All the responses are shown in Appendix 3

The students' responses, all of which can be seen in Appendix 4, indicated that the day was enjoyed by virtually all the participants who completed questionnaires, and resulted in a significant increase in interest in

science. This increase was more marked for general interest than for a specific aspect of science.

Table 2: Summary of the impact of the Secondary Final Day event on students

	Yes	No	Y&N etc
Did you enjoy the Final Day event?	42	1	1: "It was okay"
Before the event were you interested in science?	43	1	
Has your general interest in science and/or technology increased as a result of taking part in this event?	32	12	
Has your interest in any particular aspect of science or technology increased as a result of taking part in the event?	17	19	
Are you now more interested than you were before the Final Day in studying a particular science or technology subject?	13	22	(1 x "always been interested")
If you were already interested in studying a science or technology subject after GCSEs are you more interested in studying a science or technology subject at university as a result of taking part in the event?	14	19	1 x ?

#### Commentary

The responses to these questions indicate that students' interest in science was at least maintained by their experience of the day, and in many cases increased. Enhanced interest in a particular aspect was equally divided between "chemistry" and "electricity", and the same was true for the greater interest generated in studying a particular subject.

#### The most enjoyed activities

The tasks the students most enjoyed were making a windmill, building paper structures, extracting beetroot juice and making it into an indicator, and the lecture. What they particularly liked was collaboratively working on practical tasks and testing their ideas. There were, however, some students who did not enjoy the lecture.

#### Suggestions for improving the event

A number of the students were quite satisfied with the day as it was, but several would have liked more practical activities, and some suggested a more interactive lecture. There were also some requests for clearer explanations of the tasks to be undertaken

### Focus Groups with Year 9 Students

One focus group was held at Hamonds High School in Swaffham, where two Year 9 students were joined by two Year 10s. They each rated the day very highly giving scores of 9 and 10 for overall quality and enjoyment. They enjoyed the competitiveness between schools, especially the prize giving as the Year 10s won bronze. The mixed programme worked well as it prevented the day dragging on too long and gave a fresh look at different areas of science from chemistry, biology and physics.

The favourite part of the day was the practical experiments in the morning. The wind turbines were felt to be particularly enjoyable. The chemistry was found a bit too easy for both year groups, making it slightly less rewarding. The microscope session was quite tricky as they hadn't used microscopes much before. Due to the teachers not being allowed to help, they found it hard to focus on the onion and were unsure what to draw.

The students said they would have liked to find out in more detail what each experiment showed, such as why a smaller wind turbine won - maybe a model answer or having a scientist explain the experimental outcomes would have been useful.

The least favoured part of the day was the lecture. Each student thought it was too long with little audience participation. They felt the subject matter and delivery were not best presented or prepared. They would have preferred a more cutting edge science approach with something more modern or relating to university.

When asked about the length and structure of the day, it was agreed that the planned schedule worked well. Everyone thought having a one-day event compared to several half days was better.

Key improvements would be to change the lecture. It was also felt that the science practicals could have been better organised as there was confusion where next to move and which year groups were doing which experiments. The constant moving around opposed to a timed session meant there was a fair bit of queuing and that equipment was not cleaned properly between groups. It also added unnecessary pressure where other schools were queuing up for the same experiments. But all four students said they would like to go to similar science events in the future.

Compared to a normal school science lesson, the Olympiad was very different. The students mentioned

lessons in school were taught primarily from text books with little hands-on practical work. The topics covered were also often fairly dry and not very interesting. If science lessons were more like the Olympiad they would be much more enjoyable and easier to learn from; the Year 9s found the chemistry part more interesting than they thought they would.

The main benefits noted by these students were that the Olympiad was more fun, had a lot more practical work, and smaller class sizes per piece of equipment worked better. It was clear from what they said that practical hands on experience makes a science lesson more enjoyable and helps improve understanding over reading and being lectured from books.

At Cromer High School the five students who took part in the focus group particularly enjoyed making the windmill. They also appreciated the opportunity to use a microscope to look at pollen grains because they had not used a microscope at school, but were frustrated by the long time it took to focus it. They enjoyed collaborative working but would have preferred to work in pairs than in a group of five as this would have given each of them a greater say in how to proceed with their tasks. Like the primary school participants, they noted how the Olympiad was different from school science lessons:

R: It was more practical, less writing. Yeah, we do quite a lot of writing. Yeah, writing and planning things and bookwork and stuff like that. I think it would be pretty cool if we did stuff like that like all the time. .... Every other science lesson have a practical. Yeah. That would be good.

W: Yeah, it caters for everyone, if you're like a doing subject learner than you've got the practical to do, and in the other lessons you've got writing to do, and if you're more auditory then you can work on the other stuff. I think it was a lot different because, as we said, it was practical, but also we're just an average school so we don't have all that fancy equipment that they do, so it was really good to get some use out of the microscopes and figure that one out. Yeah, like, we've got really good teachers, and stuff and we learn loads, but we don't have the budget and the equipment

S: It's quite good that. I like hard things like challenges, because it pushes you, keeps me interested in it, rather than just sitting there just doing nothing really. Yeah.

D: So you found it a challenge?

R: Well the windmill one was good. I love building things. I found that unbelievably difficult. It wasn't like you just put it together. We were best in our year, which was pretty good.

D: So you like the fact that you guys built it rather than just watched. So, you liked the interactive nature?

W: Yes. Definitely. I think that works for every kid. Yes. Yeah, Because even if they're auditory or visual or kinaesthetic, it's still good to watch it happen. It is, it's really good to watch it happen, and kids get really, really bored with just, sit there, copy out the text book, and listen to what I say. It helps your confidence too when you do something and succeed in it, rather than just writing something down and getting the theory.

....

S: It was fun as well. I just felt that I really enjoyed it as I say because we use the equipment that we just don't have the chance

Some of the students would have liked more instructions, but the teacher disagreed:

Teacher: I think it's a brilliant idea. I love it. As I say I think it is a totally different way for them to learn. I've listened to them asking for more instructions, but one of the main points of the tasks is that they have to think for themselves, whereas in class very often they are given instruction or they ask for instruction and there is a tendency for students to want to be spoon fed. And at these events they are not spoon fed, they are given information, not too much and they are supposed to think it through for themselves. And that's one of the major things .

These students would have preferred a livelier and more interactive style of lecture, but they were keen to return to the Olympiad in any case; one declared:

C: I'm going to keep in top set, just to make sure I do it next year

Teresa Belton  
Centre for Applied Research in Education,  
School of Education and Lifelong Learning  
University of East Anglia  
August 2010

## Appendix 1

### Compilation of primary school teachers' and accompanying adults' questionnaire responses

#### Year 3

*(Teachers only) What criteria did you use to select children for participation?*

- Mix of abilities and good team players

*Did your pupils talk much about the Final Day event afterwards?*

Yes 3 No

*If yes, please describe: (did they talk to you, to each other, to classmates, to parents? What sorts of things did they say or talk about?)*

- They talked with each other and with me about the experiments carried out in the Chemistry with Cabbage lecture and were keen to try them at home and at school. They also spoke to me and later to their parents about the challenge they had been given and their success, coming second and fourth
- Keen to recreate experiments at home. Teachers and classmates
- Said to family he wants to do Chemistry, told everyone all about what he had seen and done. Really enjoyed the elephant toothpaste, lava lamp and volcano experiments in lecture. Also making bubble mix during test.
- Thought it was fun and interesting. Unusual experiments and funny at times

*Did their experience of the event stimulate questions?*

Yes 2 No

*If yes, what sorts of things were they asking?*

- Can we do some of these experiments at school?
- Can we go pond dipping in our school pond?
- Not so much questions, he just kept telling us what he had learnt

*Are there any ways in which the event could have been improved for your pupils?*

- All the activities were interesting, appropriate and well organised. On a point of safety, the route taken to Pond dipping involved walking at high level and descending a number of concrete staircases with no handrails and with some children have to carry equipment for later activities. The return route, at ground level, was much better and safer
- Somewhere to store bags and equipment
- None
- Wanted it to be more challenging – it was too easy

*Have you any other comments?*

- A well organised, entertaining and enjoyable day where the children learned a lot and come away enthusiastic. Well done
- Fantastic day – good fun and educational. Well organised.
- Enjoyed it and would do it again

## Year 4

*(Teachers only) What criteria did you use to select children for participation?*

- Mixture of abilities and good team players

*Did your pupils talk much about the Final Day event afterwards?* Yes 1 No

*If yes, please describe: (did they talk to you, to each other, to classmates, to parents? What sorts of things did they say or talk about?*

- Thought it was challenging. We wanted to work as a 4 and not to be split up. We wanted to share the things we were good at

*Did their experience of the event stimulate questions?* Yes 1 No

*If yes, what sorts of things were they asking?*

- "I was thinking how could I make the rocket shoot across the bowl"; "Why is it called the egg race"

*Are there any ways in which the event could have been improved for your pupils?*

- To stay together as a group; Should have given certificates for everyone;
- To have two medals for 3rd place (?)

*Have you any other comments?*

- Enjoyed it

## Year 5

*(Teachers only) What criteria did you use to select children for participation?*

- Aptitude for science/DT
- Enjoy science, would benefit from experience

*Did your pupils talk much about the Final Day event afterwards?* Yes 2 No

*If yes, please describe: (did they talk to you, to each other, to classmates, to parents? What sorts of things did they say or talk about?*

- Many expressed an interest in the chemistry with cabbage website and a desire to try our the activities at home. They also said they wanted to tell their friends.
- They talked to the class – they were really please with their success. They showed the school in assembly

*Did their experience of the event stimulate questions?* Yes No 1

*If yes, what sorts of things were they asking?*

*Are there any ways in which the event could have been improved for your pupils?*

- Having only one assessor for Toaster challenge meant children had to hang around too long and got restless. Same was true for Y6 weighing. The children commented that when it was their turn they felt rushed.
- More assistance was needed with the Y5 bubble activity. The demonstration was good but more input would have helped especially with getting a paperclip to float

*Have you any other comments?*

- Thanks to everyone for a great day. The challenges were good for year 5 + 6 (I didn't see the others), and the children enjoyed taking part. The lecture was excellent and it's particularly good that children can find out more from the website
- It was a really worthwhile event

## Year 6

*(Teachers only) What criteria did you use to select children for participation?*

- Good at teamwork, solving problems, good ability generally in Science/DT
- Not ch chosen before and names from a 'hat'

*Did your pupils talk much about the Final Day event afterwards?*

Yes 3

No

*If yes, please describe: (did they talk to you, to each other, to classmates, to parents? What sorts of things did they say or talk about?)*

- To each other – enthusiastic – reported back in assembly to own class
- Children discussed with me (T/A) that they found the experiment difficult (egg weighing) and that they enjoyed the 'experiments with cabbage' the best
- Ch spoke to parents who commented how much ch had enjoyed day. Ch also told pupils back at school how great the show was (esp elephant's toothpaste!)

*Did their experience of the event stimulate questions?*

Yes 2

No

*If yes, what sorts of things were they asking?*

- The children were inquisitive about the household products that were used in the cabbage experiments
- From show – how certain effects were achieved

*Are there any ways in which the event could have been improved for your pupils?*

- Too many pupils in pond dipping and DNA groups.
- Needed a bit longer for lunch as the Y4 activity overran a bit I think
- No – it was brilliant!

*Have you any other comments?*

- Royal Norfolk Show day is not the best day to run this - could it be at another time in future?
- Lorelly Wilson excellent!
- Many thanks for organising it all – the girls all had a great time
- Thank you for all your hard work!

## General – all year groups 3-6

*(Teachers only) What criteria did you use to select children for participation?*

- Teachers chose two most able scientists in their class
- Children who we felt would enjoy the day
- That they would benefit from the experience of going to a different setting, socialising, gaining confidence from working with others and widening their understanding of science. b) They had not been previously
- Those children who would most benefit from the experience
- Sensible, able children who hadn't been before
- Ability (general)
- G&T or HAPs
- G&T Science/tech

*Did your pupils talk much about the Final Day event afterwards?*

Yes 8

No(1 x little)

*If yes, please describe: (did they talk to you, to each other, to classmates, to parents? What sorts of things did they say or talk about?)*

- To teachers and classmates. That it was a fun day, described activities they did
- Explained what they had done to parents and classmates
- They talked about the Kitchen Chemistry session. They talked about the buildings, especially that the university was so big+ loved it; - younger ones didn't like the lecture (sat too far back?)
- All of the above, the activities and the lecture
- What they had seen in the lecture
- How they were going to find the website at home
- What they had done in their competitions
- Sharing what they had been doing in their workshops
- Classmates, parents
- All of the above! They absolutely loved the day and although there were no winning medals for us this year, they were still very proud of their achievements
- 8 One of our Y5 is a virtual mute but he explained in detail to me how to make the toaster! Longest conversation we've ever had! Going to university/being in a lecture theatre; also told others in assembly. Telling parents what they did – wanting to do kitchen experiments at home

*Did their experience of the event stimulate questions?*

Yes 6

No 2

*If yes, what sorts of things were they asking?*

- They wanted to do more experiments at school: "Can we do that?" Some were very interested in what people did at university
- When can we do this again
- Can we go again next year!
- Will we be able to do the experiments in class to show our friends
- Lecture ⇒ why does this happen?
- If we could do the cabbage chemistry at school
- Questions about the chemical reactions from the presentations

*Are there any ways in which the event could have been improved for your pupils?*

- Maybe less walking, particularly for younger pupils in such hot weather
- More activities with something to take home at the end of the day
- Now I am more aware of the short lunch break I will prepare the children for it better
- Better transitions between events – more organised helpers
- No!

- Maybe start at 9.30 to give a little more time for activity changeovers and lunch
- A bit confusing how different schools from same year group did different activities at different times – we got lost- not all locations were marked on our map
- No – it was great!
- They would like more activities/experiments! Even though there wasn't time!

*Have you any other comments?*

- The long list of equipment we have to provide is always a difficulty as our children have to walk to the event carrying trays, boxes, etc.
- Car parking – advice in advance as to where to park a minibus
- A visit to one of the more 'laboratory' looking buildings etc would have been a bonus. The whole day was excellent though. Thank you
- Again, again!
- A great day!
- Another great year. Well done!
- Thanks
- Thanks once again for all the hard work in organising such a large scale successful science day!
- Thank you so much for organising it. Having it at the UEA is so inspiring for the children

## Appendix 2 Compilation of primary school pupils' questionnaire responses

### Year 3

<i>Did you enjoy the Olympiad Final Day?</i>	Yes 30	No
<i>Before the Olympiad were you interested in Science?</i>	Yes 27	No 3
<i>Has taking part in the event made you more interested in Science?</i>	Yes 29	No 1

*Which activity (or activities) did you particularly enjoy?*

Colour Key: Demonstration lecture, "Chemistry with Cabbage", the quiz, bubble making, pond dipping, other

- 1 Demonstration lecture
- 2 The chemistry with cabbage and the quiz
- 3 Chemistry with cabbage
- 4 Watching chemistry
- 5 The competition
- 6 Chemistry with cabbage
- 7 Making the bigger bubble
- 8 Bubbul making
- 9 Cemsre with cabich
- 10 Cemsrey wich cabig
- 11 Chemistry with cabbage
- 12 Making a bubble
- 13 The test
- 14 I really enjoyed all of them but the best was chemistry with cabige
- 15 I liked chemistry and bubbles
- 16 Trying to make the biggest bubbal
- 17 Kemstey
- 18 Chemistry
- 19 The competition
- 20 How big is your bubble
- 21 I liked watching the lady do science, pond dipping and the bubble challenge
- 22 Pond dipping and making a bubble wand
- 23 Making a big bubble
- 24 All
- 25 A beble
- 26 Are change
- 27 I liked all of the xgsperments
- 28 Making ants
- 29 The one were we made a minni beast
- 30 The copotision

What did you like about it (or them)?

Pink=watching green=challenge mauve=fun/enjoyment/excitement blue=participation  
turquoise=learning/interest yellow=competition black=other

- 1 Seeing real experiments being done. Elephant toothpaste was brilliant
- 2 The quiz was hard and you had to get your brain going. Chemistry with cabbage was fun and enjoyable
- 3 The elephant toothpaste explosion
- 4 We got to do activities instead of lessons
- 5 Mixing all the liquids together
- 6 Doing experiments
- 7 Making the bubble stuff
- 8 That they sho you sum science
- 9 The activity
- 10 It was fun
- 11 It was exciting
- 12 The [polystyrene (??)] was put in a bowl of take off nail polish it was dissolving by going down
- 13 It was challenging and fun
- 14 I like how they do them and what they use
- 15 I like them because they were fun and funny
- 16 We had to make the likwid then make the bubble
- 17 Eight tooth past. Make a lave lape
- 18 All of it
- 19 The man when we did the year six questions
- 20 Because everybody done a different tecniqe than us
- 21 The lady doing science made a mess everywhere! Pond dipping we caught interesting things and the bubble challenges the bubbles were HUGE!
- 21 In pond dipping I found much more than I expected
- 23 Because it was fun
- 25 It was fun
- 26 It was interesting
- 27 The clours
- 28 Making the bubbles
- 29 I liked because it was chaliging
- 30 It was a charge

Was there any activity that you did not enjoy?

Yes 5

No 25

If yes, what was it?

- 2 It was the (?) where you had to make bubbles with bubble mixture
- 4 Blowing bubbles big ones
- 5 All of the science triks at the start
- 30 Bubels

*What didn't you like about it?*

- 2. It was hard and we only had one hour to do it in
- 4. We had to blow big bubbles and make our own hoop and mixture
- 5. It didn't make you happy because the tricks were boring
- 14 Nothing it was all brill
- 15 Nothing, it was all brilliant!!!
- 19 When we did year six questions the fings you had to youse was difficult to youse
- 29 I liked everything
- 30 There was only a bit interesting

*If you could make any changes to the day what would they be?*

- 1. Do a longer day with more activities
- 2. Nothing because it was so good and really fun
- 3. To have more experiments to of happened
- 4. Getting to do what year 4s and 6 made
- 5. The year 3s making the neclaces
- 6. We got to do what we wanted to do
- 7 Bawburgh got all the trophies
- 8 Not the ant
- 9 Not weting very long
- 10 Make it more interesting
- 11 Spend longer doing mini beast part
- 14 Do more things and get a go at the chemistry instead of her just doing it
- 15 have a longer lunch time
- 19 the things you yoused to arnsed the questions
- 21 There could be a lot less walking!
- 22 The experiments we watched I wished we could of tried them out
- 23 Make the day a bit longer
- 27 More adventures
- 28 Making things more challenging
- 29 Trying to make the work even more harder
- 30 Nothing

*Are you looking forward to learning more about Science at school?*

Yes 29                      No

**Year 4**

*Did you enjoy the Olympiad Final Day?*

Yes 25                      No

*Before the Olympiad were you interested in Science?*

Yes 20                      No 5

*Has taking part in the event made you more interested in Science?*

Yes 24                      No 1

Which activity (or activities) did you particularly enjoy?

- 1 DNA
- 2 DNA
- 3 Making the timer
- 4 The elephant toothpaste
- 5 All of them
- 6 Camestry with cabbage
- 7 Sand clocks
- 8 Making sand clocks
- 9 I enjoyed learning about bubble and making them and hot bubbles

- 10 I really enjoyed the talk and bubbles
  - 11 My favorite was the chemistry
  - 12 I enjoyed all of it except waiting
  - 13 Chemistry with cabbage
  - 14 I thought it was the DNA
  - 15 The cheek cell experiment
  - 16 The DNA neck
  - 17 The chemistry, top class, making a timer
  - 19 The quiz
  - 20 Elephant tooth past
  - 21 Elephant toothpaste, bubbles
  - 22 Elephant toothpaste sprayer & bubbles
  - 23 The contest was good and the science and chemistry with cabbage
  - 24 The challenge and bubbles
  - 25 I like the experiment
- What did you like about it (or them)?

- 1 The testing
- 2 Making it
- 3 It was fun
- 4 How high it went
- 5 Everything
- 6 Watching all the different experiments
- 7 It was exciting to see what happened next in the chemistry with cabbage
- 8 We kept making them rig and it was funny
- 9 They were amazing when you blow them we made big ones
- 10 I liked it when the lady made the elephant toothpaste. And when I stood in the bubble mix
- 11 It was fun to watch and there were some very good experiments
- 12 I enjoyed all of it
- 13 It was funny
- 14 I thought it was fun and challenging
- 15 Everything
- 16 The fact that it is well organized
- 17 All of the chemistry was really fun to watch and top class was fun as well. The timer was really challenging to make
- 18 That we learned a lot of fun things
- 19 I liked the lecture by Lorely Wilson called chemistry with cabbage
- 20 I realized how much fun science could be
- 21 I realized how much fun science could be
- 23 The contest was challenging and the science was interesting
- 24 They were interesting things that I had not known
- 25 They were fun

Was there any activity that you did not enjoy?

Yes 1

No 24

If yes, what was it?

- 19 I enjoyed everything
- 23 Bubbles

*What didn't you like about it?*

- 8 The camese with cambes
- 11 I liked everything about it
- 12 Waiting!
- 18 I liked everything so there wasn't anything I didn't like!
- 19 I liked everything
- 23 It was a bit easy

*If you could make any changes to the day what would they be?*

- 1. Nothing
- 2. I wouldn't change it
- 3. For your helper to stay in the room when we were making the timer
- 4. More competitions
- 9. Leaning about mini beasts as well and having longer time with bubbles
- 10 make something more intressting in the challenge
- 11 I don't think I would
- 12 doing what the lady was doing
- 15 One more lecture
- 18 That there was more teachers to go round (from our school)
- 19 I could have made a better egg timer
- 20 More expermets
- 21 Longer lunch
- 22 Longer lunchtime
- 23 Make it longer more challenging

*Are you looking forward to learning more about Science at school?* Yes 24      No 1

## Year 5

*Did you enjoy the Olympiad Final Day?* Yes 32      No  
*Before the Olympiad were you interested in Science?* Yes 31      No 1 (Y to next question)  
*Has taking part in the event made you more interested in Science?* Yes 31      No 1

*Which activity (or activities) did you particularly enjoy?*

- 1. The experiment (woman)
- 2. Chemistry
- 4. The animal finding
- 5. The toster and the cemistry with cabich
- 6. Chemistry with cabbage
- 7. The bubble workshop
- 8. chemistry with cabbage
- 9. The chemistry with cabbage and the toaster thing
- 10. The bubbles and making the toaster
- 11. Where we made the toaster
- 12. Bubble workshop
- 13. Making a toster
- 14. Making a toaster
- 15. The science talk
- 16. Making a toasta and kemstry with cabbage

- 17 Making the bubbles that bounced and watching chemistry with cabbage
- 18 Chemistry with cabbage Bubbles
- 19 The lecture
- 20 I enjoyed making the toaster
- 21 Making the microwave
- 22 I enjoyed making the pinging toaster and the quiz
- 23 The top class test
- 24 Making the toasters
- 26 Toaster pop
- 27 Mini beasts
- 28 The lecture about chemistry with cabbage and bubbles
- 29 The bubbles
- 30 The Brian bubble activity
- 31 Toaster (competition Yr5) and science woman
- 32 Making a toaster

*What did you like about it (or them)?*

- 2 It was fun when she made the explodtion
- 4 There were cool bugs
- 5 Making the toster and whaching all the experiments
- 6 I was really interested in chemister with cabbage because you can use stuff for chemeristy that you can buy from shops
- 7 I liked trying the bouncing bubbles
- 8 Learning some exprements to do at
- 9 They were interesting and the experiments were brilliant. It was great we could think how to make a toaster
- 10 It was really fun and you got to learn more things
- 11 I liked it because it was a lot of fun making and designing them
- 12 Getting wet in the pod and making square bubbles
- 13 We got to have fun and have a competition
- 14 I liked having a time to make completely your own design
- 15 It was interesting, funny, and it make me want to do it myself!
- 16 Making the toast fly up in the air
- 17 In making bubbles I thought it was good when we made square bubbles.  
In the chemistry with cabbage I liked the leaky bottle
- 18 It was fun and exciting
- 19 All the changing colours and explotions
- 20 I liked it because it was fun and I enjoyed testing it
- 21 I like the way that it was a challenge
- 22 I liked it because they were very challenging
- 23 It was nice to do something as a big group
- 24 Cutting up the shoe box
- 25 I like doing practical science and not just writing down so that is one of the things I have enjoyed!
- 26 Creating
- 27 It was fun and enjoyable
- 28 I learnt a lot and had a lot of fun
- 29 I liked learning how to make a bouncing bubble and how to stand in a massive bubble
- 30 I liked the part about Dry Ice
- 31 Interesting fun realize how much fun science can be
- 32 Because it was fun to make it pop

Was there any activity that you did not enjoy?

Yes 5

No 27

If yes, what was it?

- 3. Chemistry cos I got born after a while
- 4. The toaster thingy
- 6. The bubble workshop
- 14 Bubble making
- 28 Make toast pop up in the congregation hall

What didn't you like about it?

- 4. We had a rubbish result
- 6. It was boring
- 14 There were too many people in one tiny room
- 28 It was to rushed and when I finished I had nothing to do

If you could make any changes to the day what would they be?

- 2. When we got to make tosters it was a bit like DT so I would change the activity
- 3. Chemestriy not so long
- 4 More cake! And fishes + leeches + water mites
- 5 No walking
- 6. I would change the bubble workshop for the DNA thing
- 7. The Year 5s doing the DNA
- 8. Let Year 5 do DNA
- 9. I would make it longer so we would have more time for more activities
- 10. Doing different experiments
- 11 Have a longer lunchtime
- 12 Taking part in chemistry with cabbage would be good
- 13 More activatys and less hot
- 14 2 thing like the toaster maby a kettle that could be filled up with water
- 15 Our school winning something. Beth coming because all her friends were coming
- 17 There would be more competitions for Y5 like when we made the toasters
- 18 (?) actual egg competition
- 19 Nothing
- 20 More things to do
- 21 Nothing!!!
- 22 More compotitions
- 26 Create a mini beast
- 27 Bunsun Burners
- 28 Less rushed
- 29 Stay there longer
- 30 My changes would to have more activities and to stay there for the whole day
- 31 Longer, more activities
- 32 Make it longer. Have two breaks one in the morning and afternoon more time to have lunch

Are you looking forward to learning more about Science at school?

Yes 29

No 1

(1 x y/n)

## Year 6

*Did you enjoy the Olympiad Final Day?*

Yes 38      No  
(+1 x bits of it)

*Before the Olympiad were you interested in Science?*

Yes 37      No 1  
(1 x a little)

*Has taking part in the event made you more interested in Science?*

Yes 37      No 2

*Which activity (or activities) did you particularly enjoy?*

- 1 Chemistry with cabbage
- 2 DNA necklaces
- 3 The lecture, DNA
- 4 Chemistry with cabbage and Top Class
- 5 I enjoyed Top Class
- 6 Chemistry with cabbage
- 7 Chemistry with cabbage
- 8 Making the egg carrier
- 9 Making scales to way an egg
- 10 Building the egg weighing machine
- 11 The ant-making
- 13 I enjoyed weighing the eggs with our machine
- 14 Weighing the eggs
- 15 Chemistry with cabbage
- 16 Cemethey with cabage
- 17 Cemesry with cabige
- 18 I enjoyed the cemistry with cabbage
- 19 Making the egg timer
- 20 Doing the DNA activity
- 21 DNA necklaces
- 22 Making an egg weighing machine
- 24 The Y6 challenge [egg weighing] and the chemistry lecture
- 25 The egg weighing challenge
- 26 The competition
- 27 The competition. Making the ants
- 28 I enjoyed the chemistry with cabbage lecture
- 29 Our competition
- 30 Top Quiz. Some of the Cemistry with Cabbage
- 31 The weighing scales
- 32 The egg scales
- 33 Anthropods
- 34 Scale builder
- 35 The chemistry with cabbage lecture
- 36 The chemistry with cabbage and everything else aswel.
- 37 Chemistry with science
- 38 Chemistry with cabbage
- 39 Chemistry with cabbage

What did you like about it (or them)?

- 1 It was extremely interesting to watch something that looked like a magic trick and then learn how it was done and why the chemicals reacted
- 3 I never knew – before the lecture – lots of amaz
- 4 It was very fun and competitive
- 5 It was funny and competitive
- 6 All the experiments
- 7 All the interesting experiments
- 8 It was a fun challenge
- 9 Watching the person (Lorelly Wilson) do 25 experiments from chemistry with cabbage
- 10 Being able to build my own invention
- 11 It was creative and simple
13. I liked it because it was tough and made us think
- 14 It was a challenge and was great fun
- 15 It teaches you different ways to do experiments
- 16 Elfant toothpaste
- 17 I liked the way she made the suger paper dissolve
- 18 I liked the 'elephant toothpaste'
- 19 We had to really think of how to make it and coming up with a designn
- 20 I liked adding all those things
- 21 You got to use chemicals
- 22 They were very friendly
- 23 Fun and enjoyable
- 24 It was interesting and involved everybody
- 25 The compertision
- 26 Because it was fun
- 27 The competition was exciting and competitive and the making the ants was enjoyable and quiet
- 28 It was good because the things she used could be found around the home
- 29 That it was fun and enjoyable
- 30 Top quiz was fun (and we won!) Cemistry with Cabbage was cool, because I learnt some new facts
- 31 Because we were building something and it was a bit competitive by who won
- 32 It was fun measuring and dividing the measurements
- 33 Art
- 34 It was interesting
- 35 It was very intresting and I could do all the experiments at home
- 36 That not only it was challenging but really fun
- 37 I liked the elephant toothpaste shooting in the sky
- 38 It was really exciting and interesting
- 39 It was fun to watch and enjoy

Was there any activity that you did not enjoy?

Yes 7

No 32

If yes, what was it?

9. Making the anthropod
- 16 Making the scales
- 17 The meshuring the eggs
- 24 Arthropods
- 25 Arthropod
- 30 Egg weighing

31 The one in the Lower Common Room with the smart board

36 Nothing I enjoyed everything so much

*What didn't you like about it?*

9 Boring

16 Nothings

17 It was booring

24 The lady took interest and hurried us along

25 Not learning anything new

30 Didn't have enough stuff to build it and it was very rushed

31 Well it wasn't experimenting it was a bit boring because we just had to answer questions

36 Nothing even the drive was good

*If you could make any changes to the day what would they be?*

1. Give a little more time for the competitive activities (and for lunch)

4. More chemistry sessions

5. It was all excellent

6. volunteers in chemistry with cabbage

7. More experiments

8. More activities

9. Change making anthropods to making our own DNA

10 Do more experiments

11 I enjoyed all of it!

13 I wouldn't make any

14 more 'hands-on' activities

16 Less schools

17 More exiting stuff

18 To stay longer!

19 For it to last longer

20 Easier challenge

22 None it was perfect

23 Not swaping in the morning and go straight to the compertition

24 Nice place for lunch

27 Have more experiments to do and actually do the ones in the lectures

28 A little bit longer for the compititions

30 Longer lunch, more activities and a break time

31 Would of liked more experiments and not so rushed in the weighing scales

32 None

33 Longer day

34 Longer day

35 Make it longer and have more activities

36 More activities

37 More chemistry

38 I would make it longer

39 To do more activities

*Are you looking forward to learning more about Science at school?*

Yes 38

No

(+ 1 x kind of)

### Appendix 3 Compilation of secondary school teachers' questionnaire responses

*What criteria did you use to select students for participation in the event?*

- G&T – motivated in science
- Students invited by Science teachers of top sets
- G&T

*Are you aware of your students talking about the Final Day event afterwards?*

Yes 3 No

*If yes, to whom did they talk (each other, you, their classmates, parents, others) and what sorts of things did they say?*

- Classmates, parents; enjoyed day, enjoyed going to university
- Talked to me about their win, and how proud they felt. Talked to other classmates i.e. showing medals off and explaining the tasks that they had to do ie, building structures activity. Also assembly give to KS3 students about the day the Y7's Gold win!
- That it was fun; liked the challenge; some instruction sheets hard to follow

*Did your students' experience of the Final Day event stimulate any questions?*

Yes 1 No 1

*If yes, what sorts of questions were your students asking?*

About the arcade games and building them

*Do you feel that your students' interest in Science or Technology has been increased by participating in the Final Day event? (NB One secondary school teacher had been given a primary teacher questionnaire in error so numbers of answers to questions are variable)*

Yes 1 No

*If yes, is this general interest or interest in a specific area? (which?)*

- 1 General – mainly about university itself, courses etc

*Is there any way in which this event could have been improved for your students?*

- Programme rushed – need longer at lunch, especially when movement from place to place considered
- Smaller group sizes
- Worksheets need to be a little clearer so that pupils are more independent.
- Teachers cannot be with all of their groups at once due to locations

*Have you any other comments?*

- Some instructions for expts not clear eg, 9/10 did not know to move on to next expt when they were ready – expected all to move on at some time
- Thank you! A wonderful day as ever! Schools need to have all details of the event sooner so that we can organise the 'trip' out in good time, eg, timings, risk assessments etc. We have a lot of paperwork/organising to do 'our-end' when organising a day out of school

## Appendix 4 Compilation of secondary school students' questionnaire responses

*Did you enjoy the Final Day event of the Science Olympiad?* Yes 42 No 2⇒  
(1x it was okay)

*Before the event were you interested in Science?* Yes 43 No 1

*Has your general interest in Science and/or Technology increased as a result of taking part in the event?* Yes 32 No 13

*Has your interest in any particular aspect of Science or Technology increased as a result of taking part in the event? (NB From this question onwards, numbers do not tally as one secondary school, which returned 8 student questionnaires, had been given primary school questionnaires in error)* Yes 17 No 19

*If yes, what aspect is it?*

- 1 Chemistry
- 3 Chemistry
- 4 Chemistry
- 6 Biology and Chemistry (task 1 & 2)
- 9 The Chemistry part and Electricity
- 14 Electricity
- 15 Electricity
- 16 Constructive Physics
- 19 Biology
- 20 Finding the strength of something when you least expect it
- 21 Electricity
- 22 When the lecture in the lecture theatre about electricity
- 23 The building aspect
- 24 Chemistry
- 28 Electricity, machines and circuits
- 29 Electronics

*Are you now more interested than you were before the Final Day in studying a particular Science or Technology subject?* Yes 13 No 22⇒  
(1 x always been interested)

*If yes, which subject/s?*

- 3 Chemistry
- 5 Electricity
- 6 Biology and Chemistry
- 12 Science
- 13 Acids and alkalis
- 14 Electricity
- 17 Electricity
- 21 Electricity
- 24 Chemistry, structural engineering
- 28 Electricity/Physics
- 34 Chemistry

*If you were already interested in studying a Science or Technology subject after GCSEs are you now more interested in studying a Science or Technology subject at university, as a result of taking part in the event?*

Yes 15 (1x?) No 19

*Which activities did you find most interesting?*

- 1 First and Third (Hamonds Y10)
- 2 Chemistry copper sulphate reaction (Hamonds Y9)
- 3 Chemistry/windmill (Hamonds Y9)
- 4 Chemistry (Hamonds Y9)
- 5 Turbine challenge (Hamonds Y9)
- 6 Task 1 & 3 (Hamonds Y?)
- 7 Making the salt (Pakefield Middle Y7)
- 8 All (Pakefield Middle Y7)
- 9 The making of the tower and platform building Pakefield Middle Y8)
- 10 The last one with the tablets and balls
- 11 The challenges against the other schools
- 12 Beetroot juice squirting (Wayland Y7)
- 13 Extracting beetroot juice and turning it into an indicator (Wayland Y7)
- 14 Watching the electricity man (Wayland Y7)
- 15 The electricity lecture and the tower building (Wayland Y7)
- 16 The building of the paper platform and tower (Wayland Y8)
- 17 Biology thing (Wayland Y8)
- 18 Paper tower and lecture (Wayland Y8)
- 19 The biology task (Wayland Y8)
- 20 Building a paper platform to hold 12 bricks (N Walsham Y7)
- 21 Salt making (N Walsham Y7)
- 22 Building the structure and tower and doing the experiment (N Walsham Y7)
- 23 Building a structure to hold bricks (N Walsham Y7)
- 24 The beetroot one (N Walsham Y7)
- 25 The building the paper structures (N Walsham Y8)
- 26 Building support platform (N Walsham Y8)
- 27 Paper tower building (N Walsham Y8)
- 28 Finding the weight, volume and density of different objects
- 29 The lecture/demonstration (N Walsham Y8)
- 30 Chemistry (N Walsham Y9)
- 31 Lunchtime chemistry one (N Walsham Y9)
- 32 Wind turbine (N Walsham Y10)
- 33 'Windmill' making (N Walsham Y10)
- 34 The wind-mill building (N Walsham Y10)
- 35 Making the wind mill thing (N Walsham Y10)
- 36 Making the propeller (N Walsham Y10)

*What did you find interesting about them?*

- 1 Never done something similar before
- 2 It was interesting how the tubes got hotter and really cool when the copper was displaced
- 3 Challenging and good team work atmosphere
- 4 The chemical reactions
- 5 working together, and if it didn't work going back to try something else
- 6 The reactions and microscopes
- 7 It is a fun experiment to work on
- 8 They involved a lot of scientific things

- 9 You had to work in teamwork
- 10 The way to find the density
- 11 They were hard, yet achievable, exciting and fun
- 12 Making it into salt
- 13 It was a fun event and you worked in teams all the way!
- 14 How you made speakers with crisp packets
- 15 They were fun and engaging
- 16 It was really fun to test out structures with my friends
- 17 Everything
- 18 Building tower and watching clips
- 19 Working as a team
- 20 Because I never thought that paper could hold this weight
- 21 That you could get salt from beetroot
- 22 They were very fun and I liked working as a group
- 23 Building
- 24 That you can turn beetroot to salt
- 25 They were good for teamwork and a challenge
- 26 They were just fun but hard aswell
- 27 The Physics behind it
- 28 Particle theory
- 29 The demonstration
- 31 The food the effects
- 32 It was enjoyable to make
- 33 Practicality of working of them and how they produce electricity
- 34 Failing and redesigning
- 35 They were very involved
- 36 Making it and then testing it

*Were there any activities that you did not find interesting?*

Yes 14

No 23

*If Yes, which was it/were they?*

- 3 Pollen
- 6 The lecture
- 7 Making the paper models
- 10 Tim Hunkin
- 11 The lecture
- 16 The Electricity Lecture
- 17 The chemical test
- 19 The lecture
- 30 Biology because I/we didn't understand it. And the electricity lecture
- 31 The biology one cause we didn't get it nor do we use microscopes often
- 34 Lecture
- 35 The onion skin one
- 36 The microscope experiment

*Can you suggest any ways in which you think the event could have been improved?*

1. Better organised
2. No
- 3 Not challenge after challenge. Have a break between them
- 4 More structured
- 5 No, it was a really good experience
- 6 Get a lecture that is more interesting and less simplistic
- 7 That the task was explained better
- 8 There could have been more competitions
- 9 No the day was quite good
- 10 No
- 11 He could have spoke less and asked people from the crowd to be involved
- 12 Have more activities during the day
- 14 No because didn't find any faults and enjoyed the day so much
- 15 More time and longer break
- 16 More experiments, less of the lecture
- 17 Better experiments
- 19 They could of made it more fun and interesting and got more people from the audience to try something
- 20 They could have given more detailed explanations for the last practical
- 21 Slightly smaller teams
- 22 Explain the last activity better
- 23 There could be more activities
- 24 If it lasted a whole week
- 25 More activities, and if we won!
- 26 If we won
- 27 More experiments about Physics
- 28 Kept to a tighter schedule
- 30 Different experiments for Biology, better group, lecture
- 31 Different experiments, new lecturer, smaller groups
- 32 If last place get wooden spoon
- 33 More activities
- 34 More practical
- 35 More practicals
- 36 Have instructions for the biology activity made a bit clearer
- 37 Put the lecture in the morning

*Have you any other comments?*

- 5 Thank you
- 7 I think could have been organised better
- 11 More challenges, shorten lecture a bit
- 14 Thank you for the great day!!
- 17 Thank you
- 21 The day was fun
- 31 I fell asleep in the lecture
- 35 Was a good day, well done.

