

UCLan Widening Participation Reports

LEARNING ON SCHOOL VISITS TO SCIENCE FESTIVALS

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ABOUT THE UCLAN SEAL PROJECT

The UCLan SEAL (Science Engagement and Learning) project covers a variety of activities including outreach, public engagement, widening participation and research.

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EXECUTIVE SUMMARY

Background

Since the first science festival 30 years ago, the sector has expanded rapidly, with scores of such events taking place, particularly across Europe and the US. Many of these festivals invite school parties to visit, but whether the structure of the festivals is conducive to learning on these trips has not, as yet, been studied. This report from the UCLan SEAL project looks at the body of research on learning on school trips and studies to what extent trips to science festivals correspond to existing 'best practice' recommendations.

Methodology

Researchers interacted with three key groups: teachers, pupils, and festival organisers. A mixture of before-and-after and on-the day surveys and interviews were conducted with teachers who took pupils to a science festival. Pupils were also given before-and-after surveys and some also participated in focus groups both before and after their visit. In addition, the organisers of five festivals who catered for school visits were interviewed on a one-to-one basis, with the organising team of one of the festivals also participating in an in-depth discussion on learning.

Key findings

What science festivals do well in supporting learning on school trips:

- Primary teachers surveyed were generally happy with levels of curriculum alignment (p.07).
- Pupils generally have prior knowledge of some of the science that they encounter on their science festival visit, thus potentially boosting their learning (p.09).
- In most cases, pupils are able to participate in a number of different activities and thus encounter multiple learning opportunities (p.11).
- Where festivals are able to provide an element of activity choice, this is appreciated by participants (p.12).
- More structured festivals give pupils an element of control in a different way, through hands-on scientific exploration (p.12).
- Science festivals are an excellent forum for pupils to engage in joint activity with their peers (p.13).

Recommendations for improvement:

- Festivals should aim to hold formal consultations with teachers, although the frequency and format of such meetings should be appropriate for the event's scale and funding (p.07).
- Further research is needed into secondary teachers' views on curriculum alignment on school trips to science festivals (p.07).
- Festivals should distribute materials giving ideas for pre- and post-event classroom activities, in order to embed on-the-day learning in the wider curriculum (p.08).
- Greater consideration needs to be given to making some content personally relevant to pupils' lives (p.11).
- Find ways of encouraging all teachers to get involved activities, while taking their supervisory role into consideration (p.13).

1 Engineered for learning: science festivals, their structure and content

Science festivals are a relatively recent addition to the global festival scene, with the first such event being the inaugural Edinburgh International Science Festival in 1989. However the last 30 years have seen the sector flourish, particularly in the UK and US which are both now home to dozens of science festivals spread right across their nations.

Science festivals are heterogeneous in nature, varying in length and ranging from small local events to large, multi-site affairs. However they do have certain factors in common; all are an intense, transient science experience, and most offer a variety of learning opportunities and delivery styles within their events.

While science festivals are generally aimed at members of the public, many combine this offering with hosting school parties, usually during dedicated schools' sessions. This report looks at how such trips are structured in terms of content and operational considerations, whether those structures are supportive of learning, and what measures could be taken to improve the learning environment.

2 Learning on school trips: prior research and best practice

To consider the effectiveness of science festivals for learning, we draw on a large body of work on out-of-school learning more generally; a bibliography of further reading on this subject can be found at the end of this report.

Much research has looked at how both cognitive learning (facts and skills), and affective learning (attitude, enthusiasm, motivation) can be encouraged and reinforced on school trips, with some recent studies focusing on science trips more specifically. Although these studies tend to look at visits to museums or other informal learning environments such as zoos, they give general recommendations about best practice for learning that can be extrapolated to the case of school trips to science festivals.

We have gathered together a series of recommendations arising from previous research, in particular from Dewitt and Storksdieck (2008), Dewitt and Osborne (2007) and Rennie (2014), the latter two of which are focused specifically on learning on science-oriented trips. The recommendations are as follows¹:

a. Responsiveness to teachers' needs:

- i. Develop trips in consultation with teachers; use feedback from teachers (and pupils) to improve;
- ii. Align with curriculum topics;
- iii. Offer pre- and post-visit materials such as ideas for classroom activities.

b. Content:

- i. Include topics of which pupils have some prior knowledge;
- ii. Design activities which have some personal relevance to the pupils.

¹ Note that this is not an exhaustive list of the factors that impact learning on school trips; we restrict ourselves here to a selection of aspects that lend themselves to objective discussion.

c. Event structure:

- i. Offer multiple learning opportunities during the trip;
- ii. Provide both some structure and some opportunities for exploration; give pupils some level of choice and control;
- iii. Encourage joint activity and discussion with peers and accompanying adults.

This report considers the factors above in turn in order to assess how school trips to science festivals, as currently constituted, align with best practice for learning. It also makes a series of recommendations as to how they can be developed in order to better facilitate learning.

3 Methodology

Data collection for this study took place over the course of two years and involved five UK-based science festivals, which we anonymise as Red, Orange, Yellow, Green and Blue. The festivals which took part in the study were of varying sizes and durations, reflecting the UK science festival sector as a whole; the school trips were offered to primary pupils, secondary pupils, or both. The common factor between them was the fact that they all welcomed school trips on-site, rather than providing in-school activities, as is the model at some other festivals.

We collected data from three groups: teachers, pupils, and festival organisers. Teachers completed pre- and post-event surveys over both years of the study, and in 2017 these were supplemented with on-the-day interviews to capture views and attitudes in situ. In 2018 pupils were also given pre- and post-visit surveys and a number also took part in before-and-after focus groups.

Organisers from the five festivals took part in one-to-one interviews with researchers, supplemented by a focus group with the Red Festival organising team who participated in an in-depth discussion of learning on school trips to science festivals.

Data collection took place in a number of stages, full details of which can be found in the Appendix. Teacher and pupil data was collected at Red Festival, with input from the other festivals coming via the organiser interviews.

4 Findings

We consider the recommendations in Section 2 in turn to discover how closely school trips to science festivals align with these recommendations.

a. Responsiveness to teachers' needs

- i. Develop trips in consultation with teachers; use feedback from teachers (and pupils) to improve.

Levels of consultation with teachers when developing science festival events varied widely. The Orange Festival organisers, for example, hosted a teacher forum to canvass views, which led to changes in the format of the event. Green Festival regularly sends representatives to meetings of school science leads to canvass opinion and build relationships, and again have programmed aspects of the event in response to feedback. Red Festival uses post-event online surveys of

teachers, while Blue and Yellow rely on informal conversations through ongoing relationships with schools.

The variety in responses to this question reflects the heterogeneous nature of the science festival sector, and the fact that one course of action will not necessarily suit all. Levels of funding and operational support will impact festivals' abilities to interact formally with teachers, while smaller festivals may be more embedded in communities and able to gather feedback through other means. However the experiences of Green and Orange festivals, whose practices had been impacted by their consultations, suggests that a formal, face-to-face method of consultation is particularly beneficial. This need not necessarily happen every year, as teacher motivations are unlikely to change on that timescale.

RECOMMENDATION: Festivals should aim to hold formal consultations with teachers, although the frequency and format of such meetings should be appropriate for the event's scale and funding.

ii. Align with curriculum topics.

Festivals vary in how much of their content aligns with the curriculum. Orange Festival, for example, highlights curriculum links for some but not all of its sessions, while Green consults teachers about aspects of the curriculum which they would like to be covered. By contrast, Blue said that while some content might align with the curriculum this was by chance, while Yellow and Red did not explicitly attempt to link to the curriculum.

However the Red Festival coordinator noted that much of the KS2 curriculum "...is based on setting up a hypothesis and testing it... it's the scientific process that they're trying to encourage," meaning that examples of such activity at the festival were relevant to the curriculum. They also pointed out that the festival experience is unlike a museum or science centre in that teachers cannot arrange a visit for the appropriate time in the year for a particular topic, but have to attend when it is on, which makes providing explicit and relevant curriculum links doubly difficult.

Despite this, when we asked teachers how relevant their experience at Red Festival was to the national curriculum, 45% strongly agreed and a further 48% said that they somewhat agreed. Moreover, only 21% said that clearer links to the National Curriculum would have improved their festival experience. It seems, therefore, that at KS2 level the festival offer is appropriately aligned to the curriculum, despite this not being a broadly-held aim.

However Red Festival school trips are exclusively for primary schools, and we were therefore unable to gather the views of secondary teachers during this study. It may be that this group of teachers would hold a different view, and this is a question which merits further examination.

SUCCESS STORY: Primary teachers surveyed were generally happy with levels of curriculum alignment.

RECOMMENDATION: Further research needed into secondary teachers' views on curriculum alignment on school trips to science festivals.

iii. Offer pre- and post-visit materials.

Pre- and post-visit materials could be, for example, suggestions for activities schools could undertake in preparation for their visit, or plans for follow-on classroom work. None of the

festivals presented this type of material in any systematic way, although a few said that individual performers might sometimes do so. However our research has found that this is something that is strongly desired by teachers.

There is little evidence that schools are independently developing pre- or post-visit activities to embed the trip in the curriculum. A few of the primary teachers that we spoke to in the first year of the study volunteered that their school had a culture which particularly valued science, with one or two stating that they did significant work building on their festival experience. This included schools that put on their own mini-festivals in the subsequent weeks, or teachers who allowed pupils to choose topics that had particularly interested them at the event to study as a follow-up.

However in the second year of the study, we asked teachers after the event whether they had undertaken or planned any festival-related activities either before or after the festival. Only 3/27 teachers said they had done any pre-visit activity, and although more (9/28) said they undertook post-visit activity, this still amounts to only one-third of respondents.

The results of our pupil survey from the second year of the study were consistent with this finding; in fact, only 16% of pupils reported that they had done school activities related to what they had learned at the festival since returning. There was no school in which pupils consistently reported post-event activity, instead the 10 individuals who responded 'yes', were spread across four schools.

Ideas or materials for connected activity was something that was widely requested by teachers. In the first year of the study, participants interviewed during the festival were asked: "What aspects of the festival will be of most benefit to you as a teacher?" One of the themes that was mentioned again and again was that teachers gathered ideas as to things they could do in school, for example:

"As a teacher I can certainly pick up some tips for interesting activities I can do with the children."

"Gathering ideas to use as lessons within the classroom. How to make things more interactive."

Meanwhile, when asked in the second year of the study to choose from a list of suggestions for things that would improve their visit, 79% chose options concerned with related activities. More than half (52%) selected "More resources to take away," with 52% selecting "Suggestions for pre-event activities," and 48% selecting "Suggestions for post-event activities." There is a clear opportunity here for improvement of the teacher's experience of the festival, and therefore the student's learning, by systematizing the distribution of related activities.

RECOMMENDATION: Festivals should distribute materials giving ideas for pre- and post-event classroom activities, in order to embed on-the-day learning in the wider curriculum.

b. Content:**i. Include topics of which pupils have some prior knowledge.**

It has been shown that pupils learn more on school trips if they have some prior knowledge of the topic being discussed. In general festivals did provide this, although we can make a distinction between two methods and motivations for doing so.

Some festival organisers were aware of the learning benefit of prior knowledge, and this awareness had shaped their notions of appropriate content. For example, the Yellow Festival organiser said:

“By bringing in good professional communicators we ensure that kids have some knowledge of what subject is about.”

The Red Festival coordinator said:

“I try and encourage [speakers] to link back to an element children might already know. I think that’s important from a learning point of view.”

Interestingly, these were the festivals which did not explicitly link to the curriculum. Those that did so also said that participants had some prior knowledge of the topics covered, but that this arose from these curriculum links. It is therefore the case that, despite differing strategies being in play, the learning benefit of prior knowledge was present at most festivals.

It is not the case that pupils would have prior knowledge of every aspect of the science they encountered during the festival. One of the benefits of attending a festival is the wide variety of experiences that are available, and it is entirely appropriate that a variety of boosts to learning are offered during the trip. However it is positive that, in the main, visitors will encounter some science of which they have existing knowledge.

SUCCESS STORY: Pupils generally have prior knowledge of some of the science that they encounter on their science festival visit, thus potentially boosting their learning.

ii. Try to design activities which have some personal relevance to the pupils.

The feeling that an experience has personal meaning and can be related to other aspects of your life is important for learning, in that it can act to boost motivation, engagement and recall, and thus academic achievement. By the nature of science, not all aspects of a festival will be of obvious personal relevance to school visitors. However provision of some content that does make such a connection is likely to be beneficial for learning.

Festival organisers were generally able to provide examples of this type of activity, although only a couple said that this was an explicit programming aim. Some organisers cited rather broad topics as evidence of personal relevance, for example that some of the science had been about social media, or that the children had learned that their bodies were an example of science. Others questioned the relevance of the issue, arguing that, for example, shows about deep-sea creatures were particularly popular.

One or two of the festivals had explicitly considered this aspect of their offer, however. The Blue Festival organiser cited examples of activities that aligned with pupils' existing interests, such as music and space, and also those that were connected to the local area: "[It's about] making them more aware of their own surroundings... [We try to] make it as personal as we can." Meanwhile the Red organisers saw personal relevance as key. "That's what we hope to achieve... in public engagement you need something they can relate to... that's the cornerstone, what I would consider an essential for any sort of PE," said the coordinator.

How successful this effort was is, however, debatable. Of teachers surveyed post-event in 2018, 14/29 strongly agreed with the statement "The material presented to my school had some personal relevance to the pupils' lives and interests," while a further 13/29 somewhat agreed, meaning that 93% agreed to some extent. When asked for more information, however, most did not respond. Only 6/29 gave relevant comments, for example:

"The pupils were fascinated with the theme park maths session and the medical diagnosis and cloud making workshops, all of which I feel relate well to 'real life' experience."

Meanwhile, when pupils were asked: "Did you hear about any science that related to your life or interests?", 29/62 respondents (47%) agreed. However when we asked them to "Tell us more", many of those who said yes gave an example which did not, in fact, seem to be related to their life or interests; instead they cited things that they had found interesting or inspirational, for example:

"It interest[ed] me when I learned about the Sun."

"Science is everything."

Other comments were easier to relate to a primary child's lived experience:

"At home you could eat meal worms."

"Electricity I use at home is science."

In all, 19/62 respondents cited something that could broadly be interpreted as personally relevant to them. This suggests that, if organisers do feel that personal relevance is important to the festival experience, it is a facet that may need some fine tuning. This is not to say that every aspect of the day must be directly relevant to a child's lived experience, but providing some measure of this has the potential to boost learning.

RECOMMENDATION: Greater consideration to be given to making some content personally relevant to pupils' lives.

c. Event structure

The heterogeneous nature of science festivals makes it difficult to make a blanket statement about whether they fit in with best-practice structures for school trips. However the vast majority of the festivals met at least some of the structural conditions for a good learning experience.

i. Offer multiple learning opportunities during the trip.

One of the strongest points of the sector is that multiple learning opportunities are offered during a visit, with visitors typically participating in a number of different activities at all except the very smallest festivals. Orange and Blue both operated a series of workshops that school groups circulated through, while Green and Red both included a mixture of lecture-style shows, workshops and interactive free-exploration areas. Clearly the opportunity for such a range of activities is dependent on the scale and funding of the event, but overall this provision of a spectrum of experiences is a strength of the sector as a whole.

SUCCESS STORY: In most cases, pupils were able to participate in a number of different activities and thus encountered multiple learning opportunities.

ii. Provide both some structure and some opportunities for exploration; give pupils some level of choice and control.

A number of festivals offered a 'market-stall' section with multiple stands which pupils could visit at their own pace to do a variety of hands-on activities. Such activity gave an opportunity for pupils to explore, as a counterpoint to formal talks/workshops, and also provided an element of choice. However not all festivals provided, or wished to provide, such an offering; for some, space was too limited, while others felt that a more structured approach was beneficial to learning.

At Red Festival, which has a mixture of formal shows and self-guided stalls, survey respondents seemed to appreciate the variety. The vast majority of pupils (84%) said they had had an opportunity to discover and explore science for themselves. When asked what the best part of their experience was, a third cited things they had done during the free exploration section whilst just over a third cited the shows, indicating that the festival was meeting a variety of learning needs.

However literal exploration, in the sense of free roaming, was not the only way in which science festivals were able to give participants a level of control; many had multiple opportunities for 'hands-on' activities which allowed for exploration in the scientific sense. Blue Festival, for example, is wholly workshop-based but each activity is practical following a brief introduction. This hands-on activity, whether via free choice or scheduled, was highly valued by teachers, being mentioned by participants at every stage of research.

One point of note is that organisers largely rejected the idea of giving pupils worksheets, a standard method of giving structure to school visits. "I like hands to be free and brains to be engaged," said the Orange Festival organiser. As all festivals had an element of lectures/shows/workshops, this served to provide the structure which a worksheet might supply on other trips.

SUCCESS STORY: Where festivals are able to provide an element of activity choice, this is appreciated by participants.

SUCCESS STORY: More structured festivals give pupils an element of control in a different way, through hands-on scientific exploration.

iii. Encourage joint activity and discussion with peers and accompanying adults.

Opportunities for joint activity with other pupils is widespread, through hands-on group work and free exploration where available. This is a part of the science festival experience which most organisers felt was important; for example, the Orange Festival organiser said:

"The majority of the experience that we offer [involves] them working together in pairs or learner groups. The experience of the group as a whole is important."

Joint activity was mainly within the school party or friendship groups, although Blue Festival provided opportunities for pupils to work with peers from other schools, which they reported was appreciated by participants.

However reporting was mixed as to whether accompanying teachers and other adults were also involved in this activity. "It depends on the teachers as to whether they get stuck in... we have really enthusiastic teachers but it varies," said the Green Festival organiser. However organisers were aware that teachers also had a supervisory role which meant that they could not always focus entirely on science learning, especially in formats where pupils could move around.

At Red Festival teachers are able to accompany their pupils around the free exploration section, although not all choose to do so. There was some evidence that pupils would have liked this to be more of a feature; one focus group pupil told researchers:

"I think it would have been better if your teacher would come round and go on the stalls with you. So say if you didn't understand it, then they could explain it in the way they know you understand."

Festival organisers in general also preferred teachers to be involved; in fact the Orange organisers had changed the format of their event having found that with a very informal structure, teachers tended to get less involved.

SUCCESS STORY: Science festivals are an excellent forum for pupils to engage in joint activity with their peers.

RECOMMENDATION: Find ways of encouraging all teachers to get involved activities, while taking their supervisory role into consideration.

5 Conclusions and recommendations

Science festivals are, by their nature, a rich and diverse experience, and as such have the capacity to meet a variety of learning objectives. It is not expected that every aspect of a science festival visit should meet every school trip learning goal; it is precisely because of their varied character that they are able to provide a mixture of experiences.

Our study shows that science festivals are very effective in meeting a number of the good practices for learning on school trips set out in section 2, particularly in the way that the events are structured. Multiple learning opportunities are available, pupils have an element of control over their activities and joint activity with peers is widespread. In addition, festivals provide at least some topics of which pupils have prior knowledge, and primary teachers at Red Festival seemed happy with the level of curriculum alignment, although this was not a specific aim of the organisers.

There are, however, opportunities for improvement. Although some organisers acknowledged the importance of providing activities with personal relevance to visiting pupils, this could be implemented in a more effective manner. Not every element of a festival needs to fall into this category, but providing at least some content that visitors can relate to their own lives has the potential to boost learning.

Festivals could also boost their potential to deliver learning on the school trips that they host by greater interaction with teachers. Opportunities exist for greater consultation with teachers, and to involve them more in the day's activities (while being mindful of their supervisory role). In addition, teachers are keen to receive related materials, particularly ideas for classroom activities. By providing these in a systematic manner, festivals can embed the learning they deliver more fully in the curriculum, with the potential for more lasting impact.

6 Summary of results

Learning objective	Met?	Comments
a. Responsiveness to teachers' needs:		
Develop trips in consultation with teachers; use feedback from teachers (and pupils) to improve.	Varies	Levels of consultation varied widely but where it took place it impacted on practices.
Align with curriculum topics.	Varies	Festivals vary as to how much content aligns with the curriculum; this was not a key aim for most. However most Red Festival teacher attendees agreed that content was relevant to the curriculum, despite organisers not explicitly seeking to provide this. Further research with secondary school teachers is needed.
Offer pre- and post-visit materials.	X	None of the festivals provided this in a systematic way, but our research shows that this is strongly desired by teachers.
b. Content:		
Include topics of which pupils have some prior knowledge.	✓	Some festivals did this through a degree of alignment with the curriculum, while others felt that it was important for learning that topics were chosen that pupils would have some knowledge of.
Try to design activities which have some personal relevance to the pupils.	Varies	Festivals vary as to whether this is a key priority. Few Red Festival attendees were able to name something they had seen which had personal relevance to them.
c. Event structure:		
Offer multiple learning opportunities during the trip.	✓	Visitors typically participated in a number of different activities.
Provide both some structure and some opportunities for exploration; give pupils some level of choice and control.	✓	Some festivals provide physical opportunities for exploration while others give pupils control through hands-on activities. All provide at least some structure.
Encourage joint activity and discussion with peers and accompanying adults.	✓	Opportunities for joint activities with peers was widespread and at some festivals accompanying teachers and other adults were also involved. However festivals could do more to ensure teacher participation.

About SEAL: outputs and activities

UCLan SEAL (Science Engagement and Learning) is a wide-ranging project focusing on access to science, public engagement and science learning. As part of our work on science learning on school trips, we are engaged in the following activities:

Science packs

We have developed science packs, containing fun 'do-at-home' activities, which we are distributing to pupils in schools in areas of deprivation.

Science resource development

We are working with an advisory group of teachers to develop classroom resources to tie in with trips to science festivals.

Sharing insights with other science festivals

This report is being distributed to members of the UK Science Festivals Network, and its authors are giving talks at relevant meetings in order to disseminate its findings. We also intend to share our findings with science festival organisations internationally.

Working with festival team/s to enhance school trip learning

We are working directly with festival organisers to enhance learning on school trips.

Related projects

This study forms part of our group's broader focus on science participation and learning, which also includes the following:

GCSE attainment

Through the Young Scientist Centre, a partnership between UCLan and the Royal Institution, we are examining the effect on attainment of participating in workshops linked to GCSE core practicals.

Space science in low-participation communities

We are working in collaboration with the Blackpool PIER project, studying the impacts of a three-year longitudinal intervention bringing space science to young people in low-participation areas.

Young people's attitudes to science

We are exploring the science attitudes of older primary-school pupils in order to inform efforts to boost science participation.

Academic publications

SEAL researchers have published the following related papers in academic journals:

Canovan, C., & Luck, C. (2018). Seeing for yourself: How ambient information shapes parental attitudes to higher education. *Widening Participation and Lifelong Learning*, 20 (4), 148-168. doi:10.5456/nvpll.20a.148

Canovan, C. (2019). "Going to these events truly opens your eyes". Perceptions of science and science careers following a family visit to a science festival. *Journal of Science Communication*, 18 (02). doi:10.22323/2.18020201

Luck, C., & Canovan, C. (2019). "Science is not boring at all, it is fun and I feel I want to know more." *The impact of a university-based science festival on science learning: attitudes, behaviours and understanding*. Manuscript submitted for publication.

For more information about this report and related publications contact Cherry Canovan, ccanovan@uclan.ac.uk. For more information about the SEAL project contact engageuclan@uclan.ac.uk.

Further reading on learning on school trips

Anderson, D., Lucas, K. B., Ginns, I. S., & Dierking, L. D. (2000). Development of knowledge about electricity and magnetism during a visit to a science museum and related post-visit activities. *Science Education*, 84 (5), 658–679.

[https://doi.org/10.1002/1098-237X\(200009\)84:5<658::AID-SCE6>3.0.CO;2-A](https://doi.org/10.1002/1098-237X(200009)84:5<658::AID-SCE6>3.0.CO;2-A)

Bamberger, Y., & Tal, T. (2007). Learning in a personal context: Levels of choice in a free choice learning environment in science and natural history museums. *Science Education*, 91 (1), 75–95.

<https://doi.org/10.1002/sce.20174>

Belin, C. (2018). Formal Learning in an Informal Setting: The Cognitive and Affective Impacts of Visiting a Science Center during a School Field Trip. Retrieved from

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[https://doi.org/10.1002/1098-237X\(200007\)84:4<524::AID-SCE6>3.0.CO;2-X](https://doi.org/10.1002/1098-237X(200007)84:4<524::AID-SCE6>3.0.CO;2-X)

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<https://www.routledgehandbooks.com/doi/10.4324/9780203097267.ch7>

Whitesell, E. R. (2016). A day at the museum: The impact of field trips on middle school science achievement. *Journal of Research in Science Teaching*, 53 (7), 1036–1054.
<https://doi.org/10.1002/tea.21322>

Appendix: Data collection

Data was collected from three groups (teachers, pupils, festival organisers) as follows:

Data collection method	Number taking part	Notes
Teachers (Red Festival)		
Teacher pre-visit survey (2017)	20	Phone interview/online survey
Teacher post-visit survey (2017)	13	All 13 participated in both stages
Teacher on-the-day survey (2017)	27	Structured interviews
Teacher pre-visit survey (2018)	39	Online only
Teacher post-visit survey (2018)	29	11 participated in both stages
Total teachers interacted with	94	Accounting for multiple interactions
Pupils (Red Festival)		
Pupil pre-visit survey (2018)	124	Online survey
Pupil post-visit survey (2018)	64	61 participated in both surveys
Pupil pre-visit focus groups (2018)	33	Five groups across three schools
Pupil post-visit focus groups (2018)	24	Four groups across three schools
Total pupils interacted with	161	Accounting for multiple interactions
Festival organisers		
One-to-one interviews	5	Phone/face-to-face interviews
Red Festival organisers focus group	4	
Total organisers interacted with	8	Accounting for multiple interactions
Total individuals involved in study	263	



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