Public Engagement

EVALUATION FRAMEWORK

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1. Foreword

The STFC Public Engagement Strategy 2016-2021 is unambiguous about the importance of evaluating public engagement activities. For us, evaluation serves three core aims – it allows us to report on the outcomes of our engagement, enables us to improve on our past efforts, and gives us the opportunity to celebrate the successes of the STFC community.

This Public Engagement Evaluation Framework is the result of much careful thought, reflection, and discussion. It sets out the data we want to capture about our programme. From the outset, we conceived of this framework as applying to the entire STFC public engagement programme; in practice we have piloted it initially within our own engagement programme at STFC's national laboratories and campuses. We believe it is of equal interest and application for our wider community partners. We hope that by making our framework available now, we can foster thinking within our community about their own approach and their own needs.

At its core, this approach is significant for us because we have set out to create a structure that allows us to evaluate our programme as well as our individual activities. There are many different ways to evaluate stand-alone engagement activities, but we set ourselves the challenge of being able to compare and contrast the diverse activities we offer in a rigorous and meaningful fashion. This has entailed us thinking long and hard about how we define the inputs, outputs, and desired outcomes of our work. This last point is especially significant, and resulted in our adoption of tailored generic learning outcomes that we now use across our programme.

Where will this work go from here? We see this framework as a platform for ongoing development and, when appropriate, we will update this document to reflect our new thinking. We are already working with partners to use this approach when evaluating certain aspects of our national programme. We see opportunities to work with our grant holders from across the UK in helping them adopt aspects of this approach where it can help their work, and will also be talking with our international partners to share approaches to evaluating engagement.

Most importantly, we are always willing to listen to your views about our approach, and to improve our understanding of how it might help STFC's community. When you have any comments, questions, or reflections, please don't hesitate to contact the Public Engagement team and share your thoughts.

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2. Introduction

A good body of work exists of evaluation practice that is used at the level of individual events. This framework sets out how STFC will evaluate the whole programme of public engagement activities that STFC carries out and funds, as detailed in the STFC Public Engagement Strategy (2016-2021).[1]

The programme is wide-ranging and involves many forms of public engagement. It is delivered through a number of mechanisms including:

- STFC public engagement awards
- Public engagement carried out by holders of research grants
- The STFC National Laboratories public engagement programme
- Partnerships with national organisations

This includes the audiences that we reach through the training and support that we provide for teachers and other educators.

The framework defines a coherent and systematic approach to evaluation of this whole programme. It is informed, in particular, by the STFC Impact Evaluation Strategy, the Research Excellence Framework, and the work of the National Coordinating Centre for Public Engagement. We expect to add to this framework as we implement it and reflect on our progress.

We are deeply grateful to Karen Bultitude and Catherine Aldridge for their advice on this framework.

For further information, please contact:
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1 STFC Public Engagement Strategy is available at:
http://www.stfc.ac.uk/files/corporate-publications/stfc-public-engagement-strategy

3. Context: Plan, Do, Review

The STFC public engagement programme follows an iterative process summarised by the simple model shown in Figure 1:

Figure 1: Plan, Do, Review.

This process can be used at the level of an event, a programme of events, or at the level of the programme as a whole. When applied to the programme as a whole:

⚛ 'Plan' is the five-year STFC Public Engagement Strategy, which sets out our vision (how STFC public engagement fits into society), our mission (the broad approach to reaching our vision), and our strategic aims (the five key ways in which we will achieve our mission).

⚛ 'Do' is our annual Delivery Plan.

⚛ 'Review' is the implementation of this Evaluation Framework.

4. Our aims of evaluation

STFC has three interlinked aims in evaluating our public engagement.

Report

To improve the way the impact of STFC's public engagement programme is reported by being systematic about how data is captured. This will ensure consistency across reporting including:

a. STFC annual Impact Report

b. Reports to STFC Council and Executive Board

c. Reports to advisory panels including the Skills and Engagement Advisory Board and the Advisory Panel for Public Engagement

d. Grant holder reports to STFC.

Improve

To improve the impact of STFC's engagement. This improvement can take place at all levels, ranging from an individual activity, up to the Public Engagement strategy as a whole.

Celebrate

To celebrate successes through the production of, for example, case studies, press releases, web notes and presentations.

With these aims in mind, this framework sets out our definition of key concepts and the data we intend to collect.

5. What is STFC public engagement?

Evaluation of public engagement requires a clear definition of that engagement – a definition of the scope of what is being evaluated.

Figure 2 – the so-called 'public engagement triangle' – represents how public engagement happens in three main ways[2]. Good quality engagement can exist anywhere within the triangle (i.e. with a different emphasis on each approach).

To inspire, inform, change, educate, build capacity and involve or influence audience decisions.

To use the views, skills, experience and knowledge of the audience to inspire, inform, change, educate or build our own capacity or decisions.

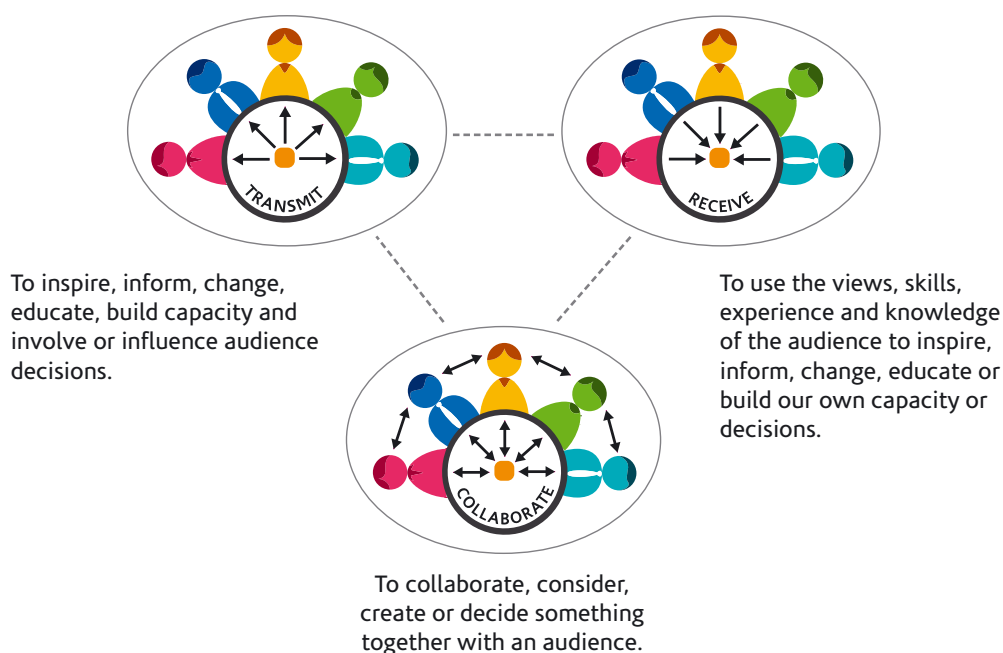To collaborate, consider, create or decide something together with an audience.

Figure 2: The public engagement triangle.

Building on this, and also the definition of public engagement provided by the National Coordinating Centre for Public Engagement, our definition is that STFC public engagement:

1. is about STFC science and technology. STFC public engagement often needs to communicate basic science or engineering ideas but it should always link these to research, technology and applications in which STFC is involved, or the people who do this work.

2. is for school or public audiences. Public engagement does not include engagement with audiences such as stakeholders, industry or undergraduates. One activity which has some overlap with engagement audiences is recruitment into STFC (e.g. at apprenticeship level). In this instance the distinction is that our public engagement has wider aims than recruiting into STFC.

3. inspires and involves these audiences. Public engagement should be tailored effectively for its audience. For STFC, the inspiration of our science and technology is often the key to engaging people; activity should also involve audiences and there are many ways and degrees to which this can be done.

2 Adapted from 'Doing Public Dialogue', *ScienceWise*, 2012
http://www.sciencewise-erc.org.uk/cms/assets/Uploads/120727-RCUK-Resource-FINAL.pdf

6. What dimensions of public engagement are we evaluating?

We will capture quantitative and qualitative data about five key dimensions of public engagement. Some of these dimensions are fairly standard management concepts (i.e. inputs, processes). For the others (outputs, reach and outcomes) we have developed concepts and definitions that we believe are particularly relevant to our public engagement.

Table 1 provides top-level definitions of these five dimensions. Further detail is in the appendices. The definitions primarily inform the gathering of quantitative data. In due course, we will produce definitions to support the gathering of qualitative evidence.

Dimension	Definition
Inputs	Public engagement inputs include the time, skills and money that are invested into delivering engagement.
Outputs	Public engagement outputs are the events that we run and the resources that we create.
Reach	Reach has three main elements: • The number of people engaged. • The types or diversity of people engaged. • The length of time that people are engaged. We call this 'dwell time'.
Outcomes	Outcomes are the way that audiences respond to our public engagement. We have specified our intended outcomes using a model called Generic Learning Outcomes (GLOs) that is widely used in the science centre and museums sector. Following this model, we have specified seventeen outcomes organised under five headings. This outlines what audiences will: • Do • Feel • Value • Understand • and the Skills they will develop We use these GLOs to design and evaluate every part our public engagement programme. We will apply them to individual outputs (events or publications), to large and small projects, and to the public engagement programme as a whole. This means that the evaluation findings of all these activities can be aggregated to provide a basis for evaluating our strategy as a whole. See Appendices IV and V for more on outcomes and our 'Theory of Change'.
Processes	Processes are the way we work to plan, develop and deliver our public engagement. They include our approaches to quality assurance and following good practice.

Table 1: Our dimensions of public engagement.

7. Data-gathering methods and ethics

We have piloted the gathering of quantitative data under this framework through the STFC National Laboratories public engagement programme.

Four valuable consequences of the piloting have been:

⚛ We have categorised our programme into 15 engagement 'modules' within which the activities have similar audiences and formats, and which can therefore be evaluated using similar, standardised data-gathering tools.

⚛ We have ensured that our data collection, storage, analysis and reporting procedures all follow appropriate ethical and data protection standards, such as informed consent, maintaining participant anonymity where possible, and consent for the involvement of minors.

⚛ The piloting enabled us to refine the framework itself. For example, we have changed some of the definitions so that the language we use in survey design is understandable, meaningful and ethical for respondents.

⚛ We developed 'Reporting statements' for each activity evaluated. These statements are what we aim to report about the activity and they are therefore drafted as part of the planning of the activity and its evaluation. This helps us to ensure that the data we gather does indeed provide the key insights that the relevant 'Reporting channels' (senior managers, boards, committees) need to see.

8. Reporting, improving and analysis

Quantitative data will be particularly valuable in reporting on our programme. The next stage is to pilot our qualitative data-gathering methods. We expect this, in particular, to support how we make decisions about improving our programme.

When reporting on and improving the programme, the data needs to be used with care. Nevertheless, with these concepts and definitions in place, we are in a position to use the evidence to inform analysis and key discussions about our public engagement. For example, we will be able to discuss more clearly issues such as:

- the relative importance we place on reach or outcomes in terms of the impact of public engagement;
- the relative strengths of different forms of public engagement;
- how performance of an activity changes over time; and
- what we consider to be 'good quality' public engagement.

Appendices

Appendix I: Glossary

Data-gathering method	An approach to gathering data e.g. registration forms, self-completion questionnaires, voting pads.
Data-gathering protocol	Guidance on how to use a data-gathering tool in a consistent manner.
Data-gathering tool	A specific tool that is designed to implement a data-gathering method.
Generic Learning Outcome (GLO)	A response by the audience that we intend our public engagement to elicit, demonstrating learning in its broadest sense.
Metrics	The full set of quantitative data that we will capture.
Module	A set of public engagement activities that shares broadly similar features (e.g. audience and format), such that the same data-gathering methods can be used for evaluation of these activities.
Qualitative data	Data captured through open questioning and enquiry.
Quantitative data	Data that can be measured and which is captured using closed questions or enquiry or by analysis of qualitative data.
Question bank	A set of standard questions, informed by GLOs, which can be used to construct questionnaires.
Reporting channel	A specific body which receives reports on the public engagement programme such as senior management, a committee or an Advisory Panel.
Reporting statement	A statement that we draft – prior to delivering a public engagement activity – for a specific reporting channel and which we subsequently populate with data from the evaluation.
Theory of change	The logical connection that we believe links a GLO, the public engagement we deliver to achieve it, and the evaluation data that we capture.

Appendix II: Outputs

These are STFC definitions. If STFC asks you to follow the STFC Evaluation Framework these are the definitions that should be used.

The evaluation outputs are the events we run and the resources we produce. So far, we have developed definitions about events but not yet about resources – we expect these definitions to relate to availability of resources in hard copy and online.

Outputs	Definition	Notes
Event	An event is an activity delivered for a distinct group of audience members. If an event is repeated, with a new start time, for a new set of audience members then that would count as two events. If the event runs all day but different people drop in and out all day then it is one event.	Reporting the number of events gives a top line figure to give an idea of the scale of the programme. Under these definitions, participants who attend two events will be counted twice. We do not expect data-gathering methods to be sophisticated enough to identify all repeat visitors.
Indirect event	An indirect event is one delivered by a partner who has attended our training.	This definition is valuable in enabling us to identify the multiplier effect that arises from providing training and support for partners.
Event duration	Total duration of the event from start to finish.	E.g. a stand at an exhibition – the duration may be 6 hours, even if people may typically only be at the stand for 5 minutes each (the dwell time would be 5 minutes and is an aspect of the 'reach' dimension – see Appendix III)

Appendix III: Reach

These are STFC definitions. If STFC asks you to follow the STFC Evaluation Framework these are the definitions that should be used.

Reach	Definition	Notes
Age ranges: Under 5 5-7 8-11 12-14 15-16 17-19 20-64 65+	These are the ranges to be recorded at public events.	Adults accompanying children do not always know which school year or key stage the child is in. These ages can be mapped onto the school ages. 20-64 is wide age range but we do not have a strategic reason for collecting data in narrower ranges.
School stages: upper primary lower secondary upper secondary	The age ranges to be recorded at school events: These are the last four years of primary school (or age 8-11 at public events) First three years of secondary school (or 12-14 at public events) Next two years of secondary school (or age 15-19 at public events)	These categories reflect what we see as the key stages in school engagement. Mapping these onto age ranges at public events enables us to combine data from school and public events. Middle school activities will be classified by the type of event the school is attending e.g. KS2 events will be lower primary; KS3 events will be upper primary.
Primary schools Secondary schools Further education colleges Other organisations	Other = the wide ranging organisations such as uniformed groups, community groups, youth groups, through which we often engage with audiences.	As with above categories, we recognise that we may 'double count' a school if it takes part in two different parts of our programme.
Teachers and other 'influencers': Primary school teachers Secondary school teachers FE college teachers Other	In our public engagement strategy we use the term 'influencers' for people (e.g. teachers, educators, STEM ambassadors) who we train and support to engage with audiences. We will count 'influencers' who we engage through their training and professional development (including trainee teachers). This does not include teachers accompanying schools visits.	

Reach	Definition	Notes
New to STFC science and technology	Someone that has not been to one of your similar events before.	This is a difficult metric to capture. Many audiences will not recall easily whether they have been engaged with STFC previously – so it is more realistic to capture if they have engaged with one of your events.
New to STEM	New = you do not have someone in or close to the family who has a background in science.	This is a very simplified version of the idea of 'science capital', but one that it is realistic for audiences to relate and respond to. This is best collected in a context that allows a conversation with the individual.
Gender Female Male Other Rather not say		Where possible the gender of audience members should be recorded to compare.
Schools remote from a centre of STEM for STFC science and technology.	Remote is >1 hour drive from a centre of STEM for STFC science and technology. Centres of STEM for STFC science and technology are: • STFC National Laboratories • Universities funded by STFC • Science Centres who have participated in the Explore Your Universe project	We see 'remoteness' as a key indicator of lack of access to our programme. It is, however, difficult to define precisely where our programme takes place. We have decided to focus on the three main types of places listed here. Please contact us for details of these Centres.
Schools from deprived areas	Schools with > 20% students eligible for free school meals.	Data is available for primary[4] and secondary[5] schools.
Dwell time	This is the time spent at the event by a member of the audience; it is not necessarily the same as the duration of the event.	

4 https://data.gov.uk/dataset/primary-schools-free-school-meals

5 https://data.gov.uk/dataset/secondary-schools-free-school-meals

Appendix IV: Outcomes

These are STFC definitions. If STFC asks you to follow the STFC Evaluation Framework these are the definitions that should be used.

- ⚛ Every public engagement activity should be designed to meet at least one outcome relating to each of the five main categories.

- ⚛ For most public engagement activities, most of the outcomes will be relevant but perhaps with an emphasis on a subset of them. For example, the 'Feel' outcomes should all apply to all activities.

- ⚛ More specific versions of an outcome can be written for a specific public engagement activity, but the meaning should be consistent with a 'parent' top-level outcome. This is particularly likely with the 'Understand' outcomes.

Participants will…	
Do	• explore our science and technology further for themselves • share their understanding of our science and technology with learners, peers, family and their community • consider choosing, or encouraging others, to study and pursue careers in science and technology
Feel	• welcome • at the right level • inspired • involved • satisfied
Value	• science and technology for its economic, social and cultural contribution of to society • employment in science and technology at all levels • the sharing of their understanding and skills with others
Have skills to	• carry out scientific or technical activities themselves • participate in informed discussion about science and technology • share their skills, understanding and values with others

Understand	We study the universe on the very large and the very small scale. This involves:
	• Work in the areas of:
	  • Big Telescopes
	  • Amazing Materials
	  • Inside the Atom
	  • Big Data and Computing
	• The marriage of scientific method and large facilities
	• Finding benefits for society

Appendix V: Theory of change[6]

When measuring outcomes, we are looking for a 'change' in someone's understanding, values, skills, feelings or behaviour. There is much about change among public engagement audiences that is not fully understood or is very complex. Whilst this framework will help us to be systematic in analysing our public engagement programme, it is not setting out piece of academic research to identify the causes of change or looking deeply at unanticipated outcomes.

Nevertheless, we recognise the following key points:

1. **Prior learning (where 'learning' is short-hand for our Generic Learning Outcomes)**
    Participants come to STFC activities with varying levels of prior learning. We can speculate about but do not have a full understanding of how this influences how they respond to our programme. For example, we might speculate that participants with high ratings for prior learning are likely to experience lower levels of *change* as a result of engaging with the programme. In order to allow in some way for levels of prior learning, we will use this wording in questionnaires: "*As a result of this event*, do you feel …"
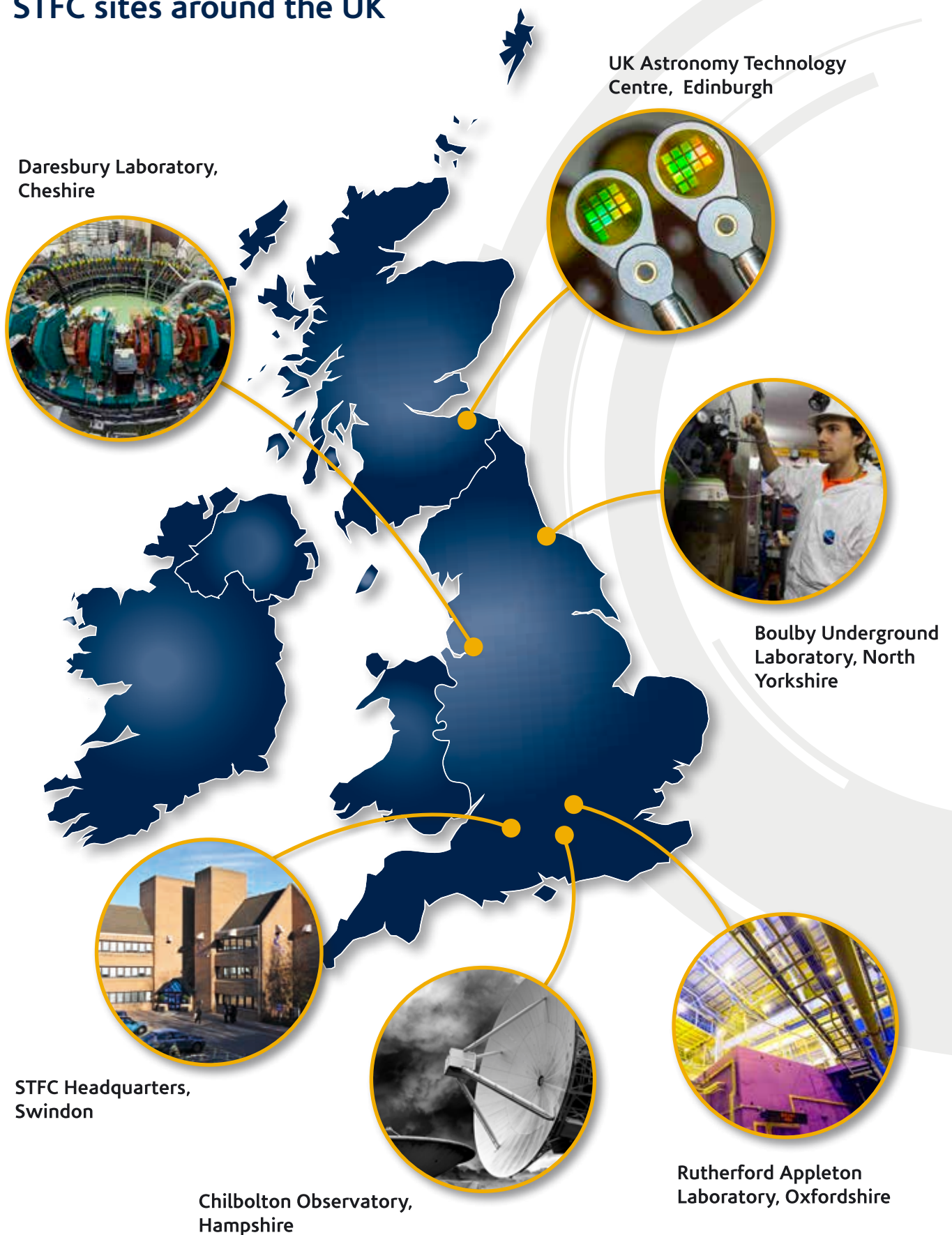
2. **Short-term impact**
    Realistically, most of the data-gathering will be carried out immediately after an event or activity. For many of the GLOs, it is reasonable to capture a snapshot of the audience response at this stage in the process. But for the 'Do' (or behavioural) outcomes it is too soon to ask the audience if their behaviour has actually changed as a result of the engagement. So, in order to gain some insights into the likelihood of future behaviour, we will ask about 'intention', using wording of questions such as: "… *do you intend* to find out more about…"

3. **Long-term impact**
    While recognising that long-term impact on learning is the ultimate goal for the public engagement programme, it is difficult to measure because of the range of other influences that are at play and because of the cost of capturing long-term data. We see this fundamentally as a question for researchers rather than an issue for programme evaluation and we will use our experience in evaluation to make a constructive contribution to the work of researchers in this area.

6 http://www.theoryofchange.org/what-is-theory-of-change/ Accessed June 2016

STFC sites around the UK

UK Astronomy Technology Centre, Edinburgh

Daresbury Laboratory, Cheshire

Boulby Underground Laboratory, North Yorkshire

STFC Headquarters, Swindon

Chilbolton Observatory, Hampshire

Rutherford Appleton Laboratory, Oxfordshire

The Science & Technology Facilities Council is one of Europe's largest research organisations. We enable the UK's natural sciences, computing, and engineering communities to continue their world-leading research by working with universities, national laboratories, scientific facilities, and regional campuses, in the UK and abroad.

We recognise that successful public engagement relies on a thorough consideration of evaluation. Our generic learning outcomes for engagement activities are supported by underlying evaluation metrics and data collection approaches. These outcomes guide our thinking in the design of engagement activities, and we will use them as a basis to work with our community to share best practice and improve standards of engagement in the UK.

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