

# Calculating reach

for STEM engagement activities

This paper offers a short introduction to the challenges and principles around calculating and reporting the reach of STEM outreach activities. It is intended to help organisations to consider the best way to define, calculate and report the numbers of schools, teachers and young people their activity reaches.

## IN A NUTSHELL

### What do we mean by reach?

Reach provides a count or estimate of the number of people who have received or been impacted by a programme.

### Why is it important?

Knowing how many people are reached by a programme is essential for understanding the impact and the value for money a programme provides.

### Direct and indirect reach

It is common to differentiate between direct and indirect reach. Direct reach is those participants who engage first hand with your activities and typically are the primary audience for a programme. Indirect reach includes those other groups who could benefit from your programme without necessarily having any contact with it.

### Reporting reach

There are multiple ways to report reach, for example in absolute numbers or as a proportion of a target population. Since reach is often based on an informed estimate, it is important to be clear about the basis of reach figures when reporting.

## Common challenges

### Defining reach

It's important to have a clear definition of your target audiences and the level of engagement each needs to have to count as reach.

### Double counting

Double counting occurs where the number of people engaging in different components of a programme are simply added up without accounting for some people taking part in more than one part.

### Digital reach

Increasingly delivery takes place remotely and online. Tools exist that help to see some levels of engagement with online resources, but they can be hard to map onto definitions of reach, especially if they are used in classrooms.

**We hope this guidance offers some useful thoughts for considering how to calculate the reach of your activity. For further information about evaluation and understanding your impact, visit:**

<https://www.tomorrowengineers.org.uk/research-evaluation/>

In order to know the impact and value of STEM engagement activities we need to know who we are impacting on, and **how many** people we have reached. Monitoring and reporting reach is generally a requirement for funders or other stakeholders, but it is not always as simple to measure as it might appear and reach figures are likely to be inconsistent across different programmes. In this brief guide, we discuss some of the key considerations for understanding and calculating reach for school based STEM activities.

### What is reach?

Reach provides a count or estimate of the number of people who have received or been impacted by a programme. Reach can be reported in absolute numbers (e.g. 5,000 teachers reached by a training programme), or as a proportion of the overall target audience (e.g. 55% of schools in a given region reached by an outreach programme).

In either case, it's important to have a clear understanding of who the intended audience is for a programme or activity, including who is eligible, how they participate and what the intended effect is for each group.

### Direct and indirect reach

It is common to differentiate between direct and indirect reach. Direct reach is those participants who engage first hand with your activities and typically are the primary audience for a programme. Indirect reach includes those other groups who could benefit from your programme without necessarily having any contact with it. For example, an intervention to improve STEM activities in primary schools by offering teacher training might have a direct reach of 1,000 teachers, but an indirect reach of 30,000 students.

It is useful to distinguish between different direct and indirect beneficiaries and to consider the extent of the impact you are likely to have for each.

You can think of this as a ripple effect. The intervention is likely to have the strongest impact on the beneficiaries who engage directly with you, with larger and larger audiences receiving a smaller benefit as the impact ripples outwards.

Programmes need to consider what they can reasonably count as reach based on a likely and meaningful impact.

## Calculating reach for face to face delivery

Knowing who has been reached is most straightforward when we are physically in a room with participants. At its most basic, and probably most accurate, where delivery is face to face we can simply count the number of people in the room.

Even this can have challenges, however. Delivering to a single class might be straightforward to count, but delivering to multiple classes or year groups may mean that there are too many individuals to count.

It is common to rely on registration figures, but care should be taken to account for actual attendance, recognising that some of those registered may not be present on the day.

Where schools are registering attendance for multiple students, the figures given may be estimates, rather than actual attendance. Schools may not have made final decisions about which students will attend, and schools absence on the day will also affect figures.

**School absence rates in 2021/22 average around 7% (up from around 5% pre Covid). These fluctuate considerably throughout the year, however.**

Reach is complicated further where a programme has multiple activities or events for the same group. For instance, a programme that encourages project based learning over several weeks will likely experience some drop out. Should reach include all those who signed up to participate, all who participated to any extent, all who participated in a set proportion of the activity, or all who completed the activity? And can you easily calculate participation in all of these ways?

So, even with face to face delivery, a certain amount of estimation may be needed.

## Double counting

Programmes that contain multiple components need to take particular care over double counting. This occurs where the number of people engaging in each component is simply added up without accounting for overlap in the different activities.

For example, a programme that provides class based activities to all students in a year group and more in depth follow up activities for students who opt in to them should take care not to count this sub group twice when reporting overall reach.

However, distinguishing between different groups who have engaged with the programme in different ways can be a helpful way to think about the relationship between different activities and their impact.

## Calculating digital reach

In the last few years there has been an explosion in the number of digital resources available for schools, ranging from information and guidance to classroom activities and lesson plans. Digital content can be easy to access and use and providers often seek to reduce the barriers to accessing them by making them free and available to download at the click of a button.

Tracking digital content is relatively easy with tools like Google Analytics, but these cannot tell you whether the resources have reached their target audience, or how and whether they are used. A variety of people might want to review a resource who are not part of its target audience. Similarly, some of the target audience who download a resource may choose not to use it after having looked at it, or might not get round to using it.

Additional information can be used to try and provide a better estimate of the reach. For example, audiences can be asked to provide information about themselves and their reasons for accessing a resource before they are able to download it. However this could introduce an additional burden that might put people off accessing the resource at all.

If download data is used to calculate reach, it is important to use unique downloads rather than total downloads to avoid double counting. When reporting figures based on download data you should be clear about the level of uncertainty and consider taking account of these by claiming only a proportion of downloads as reach based on a best estimate of actual use.

## In practice...

EngineeringUK produces a wide range of physical and digital careers resources for teachers to use with their students. Typically, a pack of physical resources intended for use with one class is assumed to have reached 32 individuals (teachers and students).

For digital downloads, reach has generally been reported as the number of downloads only, since it has been difficult to draw conclusions about the wider use of downloaded resources. However, this means that the reach figures are incomplete and under report the potential impact.

To address this, we are currently working to develop a short step prior to download where teachers are asked a couple of questions about their intended use for the resource. This additional information will help to ensure that assumptions are grounded in good information and produce more accurate estimates of the true reach.

## Calculating reach for teacher-led activities and resources

Many STEM outreach activities have a primary audience of teachers. These include training and CPD activities which aim to influence the way that teachers deliver STEM activities in school, as well as resources to support teacher led activities. Although teachers are the primary audience, the real aim of these activities is to improve outcomes for students.

As well as the challenges already identified in calculating the primary reach (the number of teachers benefiting), these activities have a further difficulty in calculating the number of students reached.

A CPD or training activity that improves teachers' day to day work with students could, in theory, have a positive impact on all the students currently being taught by that teacher, and even all those who will be taught by that teacher in the coming years. A reach figure calculated in this way could easily be in the hundreds of students for every one teacher reached. However, it is important to consider what a meaningful impact for that wider group might be. Is the experience of all those students likely to be significantly different? How would we differentiate that difference from general improvements in teaching over time?

### Class sizes

The average class size for primary schools is 26.6 in England and Wales<sup>1</sup> and 23.2 in Scotland.<sup>2</sup> Average secondary school class size is 22.3 in England and Wales but sizes vary considerably by age and subject.

A similar challenge exists with resources for teacher led activities. Even knowing how many teachers have signed up to delivering an activity, it may still be difficult to know whether the activity has been delivered to a whole class, to multiple classes or to a selected group of students.

### In practice...

A recent EngineeringUK programme provided resources to teachers to deliver an introductory workshop on robotics to encourage a wider participation in a STEM Club based programme.

The evaluation activities with teachers showed that some of those who signed up to use the resources did so in ways that were not expected, including as an introduction for STEM Club members, reaching only a handful of students.

The additional information requested from teachers as part of the evaluation helped us to be clearer about these different forms of delivery and to account for it in estimations of reach.

<sup>1</sup> [Schools, pupils and their characteristics, Academic Year 2021/22](https://www.gov.uk/government/statistics/schools-pupils-and-their-characteristics) Explore education statistics GOV.UK ([explore education statistics.service.gov.uk](https://www.gov.uk/government/statistics/schools-pupils-and-their-characteristics))

<sup>2</sup> [Chapter 4: Classes and pupils Summary Statistics For Schools In Scotland 2021](https://www.gov.scot/publications/summary-statistics-for-schools-in-scotland-2021/pages/chapter-4-classes-and-pupils-summary-statistics-for-schools-in-scotland-2021.aspx) gov.scot ([www.gov.scot](https://www.gov.scot))

## Reporting overall numbers

Programmes may need an overall reach figure to report to funders or demonstrate progress against key performance indicators. When developing reporting criteria, clear definitions of 'reach' should be agreed. This helps to ensure that appropriate methods for capturing reach data are established and allows clarity and consistency in reporting, even where these rely on estimates.

## Reporting in ranges

Where the reach figures rely on some degree of estimation, it may be helpful to report reach using a range, with the most conservative assumptions producing the bottom of the range, and the most generous assumptions used for the top of the range. For example, the reach of a downloadable classroom resource might be estimated using website data, but with assumptions about:

- % of downloads likely to result in classroom use
- number of students in those classes

Instead of estimating in absolute terms, a realistic range may be applied, e.g. 50% to 70% of downloads used and 20 to 27 students per class (actual ranges used should be informed by knowledge of the specific setting and resource). The upper and lower ends of these can then be applied to give figures for reach within a realistic range.

## Reporting as proportions

Where there is a clearly defined target population, it can be useful to report reach as a percentage of the target audience instead of or as well as reporting absolute numbers. For example, if an activity seeks to engage all year 7 students in a local authority it may be possible to report the number of students engaged as a proportion of all students in that area. This may be a more useful indicator of the success of the activity in reaching its target audience.

## Reporting multiple levels

It may be useful to report reach at multiple levels to give a clearer picture of the diversity and spread of the beneficiary groups. For example, it may be useful to report reach by number of schools, number of teachers reached and number of students.

## Reporting disaggregated reach

Where programmes are aiming to reach a specific group, it may be useful to report a breakdown of reach by target characteristics, for example by age, gender or ethnicity. Gathering this personal data presents additional challenges, however, particularly if data is gathered via the school or other gatekeeper, rather than from individual participants.

## TOP TIPS

### Tips for calculating and reporting reach

- 1. Define your audiences** clearly from the start, specifying whether you believe the impact will be direct or indirect. Indirect impact can be an important part of achieving your aims and should be included in any reporting.
- 2. Define participation**, thinking about what level of engagement has the potential to produce your intended impact. Where participation takes place across multiple sessions, what is the minimum level of engagement you want to count as reach.
- 3. Avoid double counting** when a programme includes multiple components. Each individual should be counted once, even if they interact with the programme more than once. A breakdown of the different ways participants engage with the programme can help to provide further detail and recognise the intensity of engagement alongside the reach.
- 4. State your assumptions** when reach is estimated, for example with digital resources. How do you believe the resource is being used? What do you know about the context of delivery? What specific data do you have to work from? What generalisations do you need to make?
- 5. Report a range of figures** where a precise number is not known, using the most conservative and the most generous assumptions to provide the outer limits of the range. This allows you to be more transparent about the assumptions applied and more confident that the true answer is within the reported range.
- 6. Provide a breakdown of reach for key target audiences**, for example those from under represented groups, wherever possible. This will help to demonstrate the effectiveness of the targeting and to ensure that future delivery can be targeted better.
- 7. Don't overclaim.** Figures that use only the most generous assumptions are likely to look over-inflated and lack credibility.