A woman and a young girl are sitting at a table, focused on building a robot. The woman is holding a small component, possibly a motor or sensor, and the girl is looking on with interest. The robot is a white chassis with two large black wheels and various electronic components attached. The background is a bright, indoor setting with a window showing greenery outside.

**Limit Less**

# Family events designed for impact

**A Limit Less resource for  
IOP members and volunteers**

**Use this guide:**

- To design and deliver a successful family event in your area
- To deliver the campaign messages whilst talking to families

**Thanks to IOP members  
Becky Dewey, Marion Leibl  
and Sarah Bugby for  
their help advice in  
creating this toolkit.**



## **Introduction by Professor Sir Keith Burnett CBE FRS FLSW FInstP, IOP President-elect.**

“Physics is for everyone” is a key message of our Limit Less campaign. If we are to achieve our goal of improving the diversity of our community, we must ensure that this message is heard by as many young people and their families as possible in the groups that are currently underrepresented.

A local event aimed at involving families is a great way of building interest in physics, challenging misconceptions and stereotypes, and persuading people that physics can be for them. It is also a fantastic opportunity for IOP members to build community links in their own area.

Organising and running such an event doesn't have to be a daunting prospect. Whether you have already organised many events or this is your first, I'm sure this toolkit will help by drawing upon the experience of members and our staff team.

It is full of information and advice on how to design and deliver a successful family event

in support of the Limit Less campaign in your area. It covers everything from outlining why it's so important to involve families in the first place, through to help with how to evaluate the success of the event. It looks at working with other organisations that may be interested in collaborating, suggests themes and formats for an event, and provides tips and guidance on how best to engage with families. It also gives advice on communicating with event visitors, especially those who are unaccustomed to discussing scientific topics.

Finally, there is a section on accessibility and inclusivity: looking at how we can make sure that issues ranging from picking the right kind of venue to wheelchair access are not forgotten.

This toolkit will be invaluable to any IOP group that wants to engage with young people and their families to create the next generation of physicists.

**Keith Burnett**



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## Contents

- 6** What is the Limit Less campaign?
- 8** Why work with families?
- 9** What is a family audience?
- 10** What kind of settings work well for family events
- 13** What kind of themes work well for families?
- 14** Tips for engaging families
- 16** How can I talk about the Limit Less campaign with parents?
- 18** What is an accessible and inclusive event?
- 20** Other tips for organising events
- 22** How to evaluate your impact

# What is the Limit Less campaign?

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**Limit Less is the campaign to support young people to change the world and fulfil their potential by doing physics. Its objective is that more young people from more diverse backgrounds do physics post-16.**

Young people are already motivated by the great challenges the world faces, including climate change, public health and poverty. But too many miss out on the chance to make a positive difference because they are prevented from doing physics: a discipline with so much to offer in all of these areas. The campaign will fight the prejudice and stereotypes experienced by many groups of young people, which put them off choosing to study physics at school. By correcting misconceptions about physics and removing the barriers to participation after the age of 16, we will help more young people to seize the opportunities physics offers for their future – and their world. What’s more, broadening diversity in physics benefits the field too.

**Diversity of thought makes for better physics, and at the moment, there isn’t as much of it as there could and should be.**

For these reasons, the campaign is helping young people who are underrepresented and underserved in the physics community: girls, young people from disadvantaged backgrounds, young people of Black Caribbean descent, young people with disabilities, and LGBT+ young people. Our campaign will work to remove the barriers that too often limit their participation in physics after the age of 16, by looking systematically at influences in their homes, communities, schools, and in the media and on social media.

It is vital that we “influence the influencers” – those whose opinions and advice young people listen to and trust when it comes to choosing subjects to study and career paths to follow. This toolkit will help you to do so in the first two spaces: homes and communities, by organising events for family groups.

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## Why work with families?

At key points in their lives, young people must make important decisions about the subjects they will study in school or whether they will leave to undertake an apprenticeship, for example. These decisions will affect their future study and employment prospects, what they earn and their job satisfaction. Young people are unlikely to make these decisions without first discussing them with people whose opinions and advice they trust. From an early age, young people are exposed to the opinions of a variety of people in their homes and communities: their parents and carers, brothers and sisters, friends and relatives. Positive opinions promote equality, highlight opportunities and encourage each young person to consider all the choices that are available to them. Negative opinions, based on incorrect stereotypes, a lack of information or misconceived ideas, have the opposite effect and limit the young person's view of the world and their place in it. As some of the most trusted advisers of young people, parents, other family members and friends have a crucial role in promoting a positive image of

physics. So that they can do this, we need to ensure that they have correct information about physics, and are supported to find it, so that they can provide quality advice and encouragement, especially at those key points when decisions are made about the future.

**We want to see parents, carers and other family members actively challenge the stereotypes and biases that limit their children's opportunities and choices.**

The IOP are already spending time with families across the UK and Ireland and sharing these messages and information with parents and carers. With your help, there is much more we can achieve – and in many more areas. We therefore invite you, the IOP membership, to support young people and their families by organising your own inclusive, accessible Limit Less family events – wherever you are.



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## What is a family audience?

A family audience doesn't just mean children and young people, or even just parents and their children – it can be made up of a range of intergenerational members.

**Our aim is to influence the parents and any other carers of young people, and one of the simplest ways to reach them is to run events designed for them and the young people that they care for. These may look like events for children, but they are in fact events for families, and there is a big difference.**

For starters, children's events may allow parents and carers to drop off their children and pick them up at the end. This format clearly doesn't serve our aims, not to mention the extra responsibility and requirements for safeguarding that this entails. Family events are not just for children, but rather allow parents and carers to enjoy shared experiences with their children.

Then there are the themes and the content – if the parents aren't hooked by the theme in advance, they're less likely to bring their children along. When they get there, if they don't enjoy the activities and find them interesting for their own sake (not just because the young people enjoy it), then they probably won't change their attitudes to physics or influence their children and young people back at home.

Don't worry if you don't know where to start! The rest of this toolkit contains ideas and tips for how to design and run events that have the best chance to get parents and carers – who otherwise may not ever attend a science event – on board with the Limit Less campaign and its messages.

Remember, our desired audience are the parents and carers of young people who are currently underrepresented in the physics community – girls, those from disadvantaged backgrounds, of Black Caribbean descent, with disabilities and LGBT+ young people. In some cases, the parents themselves may not necessarily share these characteristics with the young people in their family.



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## What kind of settings work well for family events?

Family activities already take place regularly in local communities and at larger regional locations. The organisers and audiences of these events are often looking for new ideas and visiting contributors. So, rather than starting from scratch when looking for a family audience, approaching these groups and offering to host a physics-based Limit Less family event can be an easy way to start. When looking for these groups in your area, some good starting points are:

- Libraries: many of them run regular programmes of family events and activities.
- Youth groups: many will already run events that require parents and carers to attend.
- Charities and organisations that support those groups that are underrepresented in physics: even if they don't already run activities specifically for families, their networks will contain the parents and carers of these young people and so the organisation should be able to help you to organise something from scratch for them.

It's essential that parents and carers are present at your event so that you can talk to them about the campaign messages. The group or organisation that you are working with may need to explicitly communicate this to parents who may be used to dropping off their children at previous events with the group.

The IOP staff in your area are ready to help you to find these organisations and groups, and even introduce you if needed.

Email [campaigns@iop.org](mailto:campaigns@iop.org) if you would like help to find local support and connections.

Of course, you may want to start from scratch and build your own audience – there is plenty of guidance below on how to make an event of your own inclusive and effective.

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**Consider: Who would you like to work with, and why?**

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## What kind of themes work well for families?

The big question is of course: what will we actually do with our family audiences?

First, it's important to remember that these Limit Less events are not outreach, or public engagement, in the traditional sense. The primary aim should not be to teach physics, or to increase awareness of an area of research. Rather, it is to show parents and carers of that physics is an interesting, rewarding and achievable pathway for their children post-16 – whether they are 16 or 5 years old when they attend. To help them to feel better about physics, its culture and its community.

One of the most effective ways to do this is for audiences to experience physics first-hand, enjoy it, meet the real people doing it, and understand its relevance and importance. Physics-based hands-on activities and demonstrations are a great way to hook parents, and so your event may look on the surface like a traditional outreach activity with demonstrations or experiments.

The difference is that the physics activities are now a vehicle to attract the audience, stimulate conversation, and allow you to talk about the messages of the Limit Less campaign. You can find them later on in this toolkit on page 16.

Your own journey as a physicist is important too. So, when considering what physics, and therefore what activities, to base your event on, it could therefore make sense to ask – what skills and interests do I have? It isn't just limited to yourself either. If you are planning your event with a team of colleagues

or volunteers, consider their specialisms and interests too. The physics and activities should follow from the people, but some examples could be:

- A physics family day with hands-on-experiments and activities for mixed ages.
- A simple read-aloud storytelling session using off-the-shelf story books with physics themes. Good examples are *Baby Loves Quarks* and *I Love Music – My First Sound Book* for early years, or the *Ada Lace* series for older children. Try to avoid books of facts (even those written for children) in favour of stories. These events work well in libraries or places that have existing storytelling sessions.
- A meet-the-scientist event for the families with slightly older children.

The campaign messages are key, and telling your own story is a great way to introduce them into conversation with parents. They will be more interested in you – your journey as a scientist and as a person – than the children's activities. You and your colleagues are relatable and exciting, and this will have a real impact on these crucial influencers of young people's careers.

What do you and your colleagues have in common with the audience? Are there any other people with even more in common that can be brought on board to show parents that people like them do physics?

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**Consider: What type of event will allow your own stories to introduce the campaign messages?**

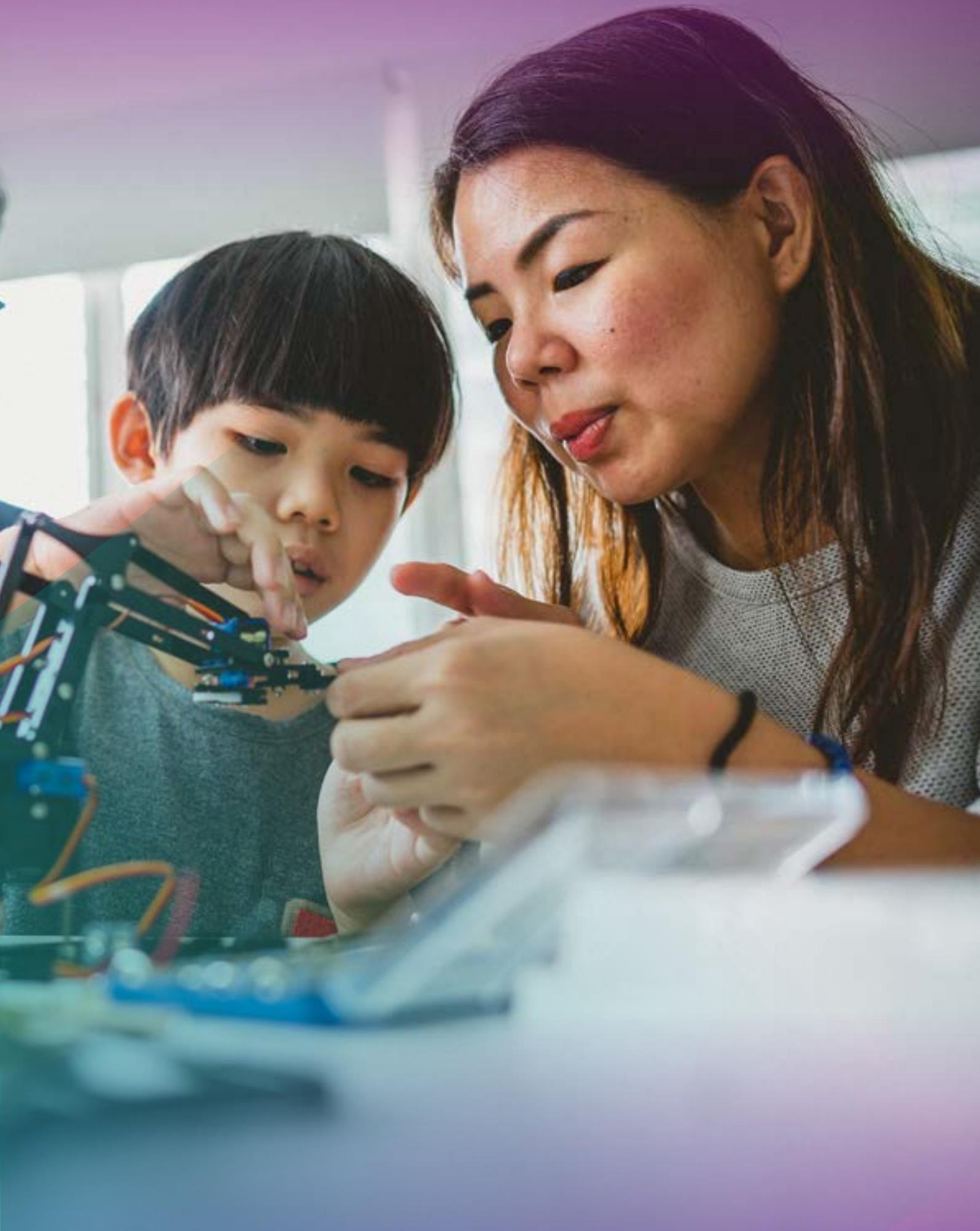
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## Tips for engaging families

If you aren't experienced at running events for families, and are keen to step outside your comfort zone, there are some simple things that can help you to design your events like a pro.

1. Keep it simple. A simple format can still have a big impact on the parents and carers if it is designed and delivered well.
2. Some events will only work for families with children of a certain age, but if you want to be most inclusive for larger families, if possible invite a broad age range when advertising (e.g. 'for all the family'). Then, deliver on the promise by making sure that there's genuinely something in there for all ages. That doesn't have to mean lots of different activities. For example, with a bit of thought, one single activity can:
  - Be fun and stimulating for young children
  - Be fascinating for older children and parents
  - Contain jokes and popular culture references for teenagers
3. Define some specific, separate outcomes for both the young people and the adults. We want the parents to hear the campaign messages, but what do you want the young people to do, or to learn or to feel? Defining this in advance, and designing the event to make it happen, means that everybody gains something from the session and goes away thinking positively about physics and the Limit Less messaging.
4. Create roles for adults that keep them involved. This is the single most effective way to go beyond the usual "just-for-kids" activities and influence parents and carers too. These roles shouldn't be optional – pick an activity or task that is crucial in order for the overall activity to work - and tell parents and carers that it's their responsibility. Of course, it helps if it's fun and interesting for them too!
5. Listen, especially to young people, but also to their parents and carers. To feel like a physicist is genuinely listening to them, rather than lecturing, can have a hugely positive impact on people's feelings about physics. Consider where your activity leaves space for conversation. A complicated session plan might not allow time to chat, get across those key messages, but also to listen and take part in genuine dialogue.
6. Offer things that the families need, beyond your physics activities. Each audience will be different, but often a good use of budget (when other costs are low) is to offer free lunch or snacks, or a creche for younger children if the activity isn't suitable for them. Make it easy for the families to attend. If you aren't sure what needs the audience might have, it could be helpful to ask the community organisers, venue, or other partners that know them better.



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## How can I talk about Limit Less with parents and carers?

The messages of the campaign are important and positive, and talking about them should be an enjoyable experience for you and the parents and carers. In fact, if it isn't interesting, an audience with no prior affinity for physics may not give up their free time for it.

It's what you talk about while they're enjoying themselves that will create the attitude change that we need. These conversations can naturally take place in and around interesting and engaging activities.

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**Here are some of the key messages of the Limit Less campaign, for parents and carers of children underrepresented in physics:**

### ***Emotive ideas:***

- **We want to make sure that the next generation have all the opportunities that they deserve.**
- **We want to help young people to engage with the world's challenges in the way that they want to.**

### ***Rational ideas:***

- **Doing physics opens the door to many stable career options, including well paid careers in all sorts of fields – not just physics.**
- **Many employers, including those outside the sciences, value the mindset and skills that physics brings.**

### ***We want parents and carers to:***

- **Overcome their own negative experiences and opinions of physics so as not to limit young people. These could include that physics is boring, not creative, or that you need to be a genius to do it – none of these things are true.**
  - **Pass on correct information to young people.**
  - **Encourage, not discourage young people that show an interest in physics.**
  - **Suggest physics to young people that might enjoy it.**
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When doing your activities, it is essential to look out for opportunities to bring up these messages, and explore them in conversation. Try to not to cut conversations short because you need to ‘get back to the activity’ – having a simple plan with a comfortable amount of time could help with this.

As well as the key Limit Less messages above, you could also be alert for opportunities to:

- Make positive reference to physicists from underrepresented groups, especially those that represent the audience that you are working with. The IOP has produced a Happy Families card game resource that features over 40 such physicists. The game could event form part of your event! Available from [iop.org/explore-physics](https://iop.org/explore-physics)
- Link the science that you are featuring (if any) with real-world jobs and interests.
- Explore where the physics helps the underrepresented group directly. For example, many types of engineering are applied inventively to help people with disabilities.



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## What is an accessible and inclusive event?

When creating events for specific audiences, it is vital that all members of your audiences are able to access them easily and feel welcome when there. Consideration of practical things like wheelchair accessibility are important, but also less obvious factors such as the venue's location and any preconceptions that your audience might have about it. If you're organising a storytelling event for families that are likely have a negative attitude to academic study, but host it in a university building, then it won't be culturally accessible for them. But if you go where they already are, for example their local library, this gives them the best chance of accessing your activities. They should have to make as little effort as possible to attend your event – we should make the effort for them. It really does help to design every aspect of your event with your specific audience in mind.

Depending which of the underserved audiences you are catering for, you should be able to find guidance on how to make an

event accessible for them. It's also important to consider the intersections between girls, young people from disadvantaged backgrounds, young people of Black Caribbean descent, young people with disabilities, and LGBT+ young people. Many individuals and audience groups may have two or more of these characteristics, and your events and activities could and should take this into consideration.

**If in doubt – ask somebody from your intended audience what they would like to see or do!**

For further inspiration, the IOP has produced a helpful Inclusivity Guide, available from

**[iop.org/inclusive-careers-tips-volunteers](https://iop.org/inclusive-careers-tips-volunteers)**

The guide is intended for careers events, but the same principles of access and inclusion apply with families.





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## Other tips for organising events

Even the smallest events benefit from some careful event management. The overall principles here may be similar to those of more familiar event formats, like public lectures, but there are other things that help with both families and underrepresented groups. While common sense goes a long way, here are some specific things that can make events run smoothly:

- Consider safeguarding. While our Limit Less families activities by definition require parents and carers to be present, there could still be instances where volunteers should be vigilant and may require background checks in order to protect children and vulnerable adults. The relevant scheme varies by location: DBS in England, Wales, the Channel Islands and the Isle of Man, PVG in Scotland, AccessNI in Northern Ireland and Garda Vetting in Ireland. Your partner or host organisation, if you have one, may be able to advise on this, and the STEM Ambassador programme in many regions offer free checks for those that sign on.
  - Carry a notebook and record your thoughts, any challenges faced, and 'golden moments' with attendees. All of these are invaluable when reflecting on your event, and yet, because you are often so busy, it can be difficult to remember the details afterwards.
  - Communication in advance is key. Whether with a partner organisation, other volunteers, or your audience, it can often pay to over-share, even when it seems like overkill. Does the library representative have your phone number? Did you tell your attendees where to park?
  - Think ahead. Try to picture yourself about to begin your event. What might you wish that you had remembered to arrange? This could be as simple as pens for the feedback forms, or less obvious things like a phone charger so that you can take photos.
  - Team roles. A clear plan for what your own exact role will be during the event will help you to identify what other roles will be needed, and how many volunteers you may need to recruit to help out. For example, if you will be leading a physics activity, will there be anybody to admit latecomers or organise refreshments?
  - Try to visit the venue beforehand. This can really help to conceive exactly what the activity will look like and how it will run, but it can also reveal potential problems with practical things like WiFi, power supply, or access to a water tap well in advance.
  - When running your activity, be careful to avoid making any assumptions about people based on their background – whether ethnicity, gender identity, disability or otherwise. Each individual is different and will have different perspectives and experiences. Again, the IOP's Inclusivity Guide can provide further guidance – available from [campaigns@iop.org](mailto:campaigns@iop.org).
  - Be careful to obtain permission when taking photos of attendees, especially young people. This is usually done by using opt-in permission forms (available on request from [engagement@iop.org](mailto:engagement@iop.org)) or in some situations, displaying signage requiring attendees to opt-out if they don't wish to be photographed. If you have a lot of attendees, a system could be put in place at the beginning of the event in which children that are opted out wear a coloured sticker, and so are not photographed.
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## How to evaluate your impact

Evaluation is very important and doesn't have to be an onerous task. It can also be much more creative than simply a feedback form. In order for us to know whether we have been successful in communicating the Limit Less campaign messages to our underrepresented audiences, we need to know who we have reached, and what positive change we may have affected with them. These can be small or large.

When initially designing your events, it can be helpful to consider where and when you will collect 'indicators' of whether an impact is being made. Rather than statistics or feedback forms (although these can be useful), more qualitative, anecdotal information can be more powerful with these types of events. The most useful and honest feedback is given informally when participants aren't even aware that they're giving it. Some ideas for building these simple evaluation tools into your event design are:

- Think of questions to ask naturally and verbally during the activity or just afterwards, (and make sure that somebody is recording the responses). These questions and their answers should reveal how the campaign messages have been received; for example, "Do you feel that your kids now understand/appreciate that physics is for everyone? Why/why not?"
- Look out for 'golden moments', or positive comments made by participants. Many volunteers cite these moments as helping to remind them why they run events in the first place!
- If your participants are creating something during the workshop, design the activity so that you can learn something about their attitude to physics from the things that they have made or done. Does it indicate that they find physics accessible or useful?

Remember, it's the impact on the parents and carers that we're interested in, not the young people – this is even more reason to design the event in a way that gives the most opportunities for parents to be actively involved.

- Think about 'contact points' for gathering indicators. When should you be in touch gathering information – before, after, and/or during the event? Try to make it as light-touch as possible while still getting the key information that you need.
- Participants usually find it easiest to give feedback by writing on post-it-notes, boards, or other physical and creative means rather than filling in forms.
- Utilise the IOP's inclusive evaluation tools to make sure that you're collecting information on the audience's characteristics in a sensitive and meaningful way.

Email [engagement@iop.org](mailto:engagement@iop.org) to access these.

- Consider offering an incentive for giving feedback – for example a prize draw. Be aware however that while this can greatly increase participation, it may also bias people towards positive feedback!
- Be honest with your results. Learning from mistakes will help your next event to be even better at communicating the campaign messages to parents and carers.

Finally, tell us about your events! Your activities and successes (and photos) will inspire others, so we really want to hear from you at [campaigns@iop.org](mailto:campaigns@iop.org).

**Did you find this document useful?  
Let us know!**

# Limit Less

Limit Less is the campaign to encourage and support young people to change the world and fulfil their potential by doing physics. It seeks to challenge the misconceptions and stereotypes about the subject and remove the barriers to young people doing physics beyond the age of 16.

IOP members, volunteers, parents and carers: sign up as a Limit Less supporter to receive more information and updates on the campaign by visiting [iop.org/LimitLess](https://iop.org/LimitLess)

The Institute of Physics is the professional body and learned society for physics in the UK and Ireland, inspiring people to develop their knowledge, understanding and enjoyment of physics. The Institute is a charity registered in England and Wales (no. 293851) and Scotland (no. SC040092).

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For further information contact [campaigns@iop.org](mailto:campaigns@iop.org).

Published April 2022