

# VIRTUAL EXCURSIONS

CREATE AMAZING STEM ENGAGEMENT  
PROGRAMS ONLINE

Best  
Practice for  
engaging  
audiences



An Australian Government Initiative





# About Inspiring Australia

Inspiring Australia is the national strategy for public engagement with STEM and contributes to the Government's vision to engage all Australians with science.

Since 2009, the initiative supported by Commonwealth, State and Territory Governments facilitates science engagement programs and supports communities in diverse ways including through fostering influential networks to connect science to big audiences and delivering grant programs to organisations, groups and individuals.

Inspiring Australia science engagement activities connect with people nationwide to:

- build an awareness and appreciation of science
- celebrate the excitement of science and scientific discovery
- enhance capability and skills
- improve science communication.

In 2020, global events forced many organisations to adapt their large scale events and STEM engagement for online delivery modes. Inspiring Australia state programs have developed this online training opportunity to assist community partners to transition their programs to online delivery. This manual draws on the expertise of specialists in online education and STEM communication backed by research to deliver the tools, techniques and tips to help practitioners develop rich, deep and meaningful online STEM engagement.

The Virtual Excursions training package has been coordinated for national delivery by Inspiring Australia NSW. It is produced and delivered by Fizzics Education, Sydney Science Education and Refraction Media with support from the Office of the NSW Chief Scientist & Engineer and state Inspiring Australia programs in NSW, ACT, QLD, WA and SA.



© Inspiring Australia. Published by Refraction Media on 11 May 2020. Written by Heather Catchpole, Claire Harris and Ben Newsome in consultation with Jackie Randles and Karen Player. Designed by Kat Power. All rights reserved. No part of this publication may be reproduced in any manner or form without written permission from Inspiring Australia NSW on behalf of state programs. If you would like to reproduce anything from this magazine, please email: [info@refractionmedia.com.au](mailto:info@refractionmedia.com.au).

The publishers acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past, present and emerging.

# Taking STEM events online

In early 2020 COVID-19 transformed society, effectively putting a stop to physical events, closing schools and workplaces, and limiting networking and collaboration in the way we were used to. Communities were quick to move online, yet multiple challenges arose in security, technical capacity and format, and virtual events ranged in quality from the ‘scrambled together’ to global, inspiring events developed by large organisations, as well as viral, virtual trends that created some memorable and mesmerizing content.

Virtual events, distance education and online community engagement have a much longer history than just this year, however. Australia’s vast distances and remote areas have meant that distance education has been the norm for over a century, using radio and post as the principal tool until video conferencing and internet technology became available in the 1990s<sup>1</sup>. In 2007, the states rolled out Connected Classroom programs throughout public schools, connecting students across the country with each other, and with hugely popular interactive programs on reef science and astronomy.

This interactivity has reached far beyond schools, with aged care centres, university students, hospital patients, juvenile justice systems and other beneficiaries experiencing virtual events from content creators large and small. Some of the most successful of these programs are included in this booklet. Included also are summaries of the information in three virtual training sessions delivered throughout May–June 2020: online presentation essentials; best practices in engaging audiences in STEM, and partnering for impact.

With expertise, the right tools and your own passion for your programs, we hope you’ll find what you need in these materials to deliver science, technology, engineering, maths (STEM) and arts programs to more people in more innovative ways than you could have imagined. By inspiring this next generation about STEM, we’ll ensure we have the innovative minds ready to take on the next great global challenge.

---

<sup>1</sup> Newsome, B. 2013. Best practice in science education via video conferencing. Winston Churchill Fellowship Report.

# 5 ways to approach your virtual event

**1** Don't forget all of your analogue training – invite audience participation such as raising hands, use props, eye contact, asking questions, and inviting ideas.

**2** Pick a platform that works for your audience – consider if a Q&A session is better than a webinar, as well as how much audience participation you're after, and what, if any, security protocols they may have in place.

**3** Make the session interactive – use polls, quizzes and Q&A to establish a rapport, keep audience engaged and find out more about them.

**4** Create an environment in which all voices can be heard – keep in mind any constraints there may be on different audience segments, and actively invite them to share their insights.

**5** Be creative – think outside the box in keeping the audience engaged. Could you use your chat stream for live poetry? Or start a virtual Mexican wave? Think about creative ways to keep people entertained as well as informed.

## Equity is important!

Always think about access for low socioeconomic areas, and also elderly people or differently abled people who would like to access your content.



Vinnie cam at The Cleveland Museum of Natural History. Photo Fizzics Education.

## Marketing and understanding your audience

### Who is your audience?

Are you delivering an online experience to your existing audience? Is your focus existing supporters or visitors who are familiar with your organisation?

Or, do you want to reach new audiences? Do you want to engage with people who don't know anything about you?

Deciding on this mix is crucial for what you do next.

### Find your audience

If you have an existing audience, think about how you already engage with them. Write a list:

- social media channels, for example, Facebook, Instagram, Twitter

- email / e-newsletters
- promotions with other organisations
- in newspapers or magazines
- in-person / signage on-site
- via phone.

Use as many existing channels to tell them about your new online events.

**Hot tip:** Sound out interest before investing. If your usual audience is now consumed with the challenges at home with work and children, do they want to come to an online event?





An analogue prop (stuffed penguin) combined with digital imagery in a presentation at the California Academy of Sciences.  
 Photo: California Academy of Sciences

**Watching videos online is shown to increase people’s confidence, motivation and learning. What can you show your audience to help them?**

## Do your research

### Existing audiences

Dig into the data you already have to understand your audience demographics. Take a look at Facebook statistics and Google analytics, past surveys and other resources to give you data. You might be surprised to find who you are already reaching. Search for data on their ages, regions, education levels and interests.

### New audiences

Targeting new audiences? Undertake some market research to find out as much about them as possible.

- What do they like to do?
- Where do they hang out online?
- What are they searching for?
- Can you work with organisations with this audience already and ask them to share your events?

### Digital marketing

Online/digital marketing tools can help you find and understand your audience. Learn about their online search, social media behaviour and what they want.

Here are some quick tools. These can help you find the audience AND choose the right keywords for your content so they can find you.

Google Trends and Think with Google, Scoop.it and Feedly are free. Ahrefs, Social Animal, Sprout Social (social media keyword research), BuzzSumo (popular topics and who the ‘influencers’ are) have different costs.

**Read more:** What Google search data reveals about what people need in this moment, and how brands can help at [this link](#).

## What is your message?

**What is the one take away from your online event? Have a purpose and a clear goal in mind.**

These five Generic Learning Outcomes (GLO) can be a guide:

- |   |                               |                 |                                      |   |
|---|-------------------------------|-----------------|--------------------------------------|---|
| <b>1</b> Enjoyment, inspiration, creativity | <b>2</b> Attitudes and values | <b>3</b> Skills | <b>4</b> Knowledge and understanding | <b>5</b> Activity, behaviour and progression. |
|---|-------------------------------|-----------------|--------------------------------------|---|

Consider if you need to align with school curricula. See Inspiring Australia’s [Evaluation Guidelines](#).

## Listen to your audience

You might think: “I’m providing valuable access to a unique piece of scientific infrastructure”. The parent audience hopes: “You are going to entertain, educate and keep the children busy for 30 minutes, right?”.

What does your audience want?

- What are they struggling with right now?
- What do they believe their problem is?
- What words do they use?
- Do they have a solution in mind?

The trick to listening, and then responding effectively, is meeting your audience where they are. Then do what you can to provide value to address their challenge/problem.

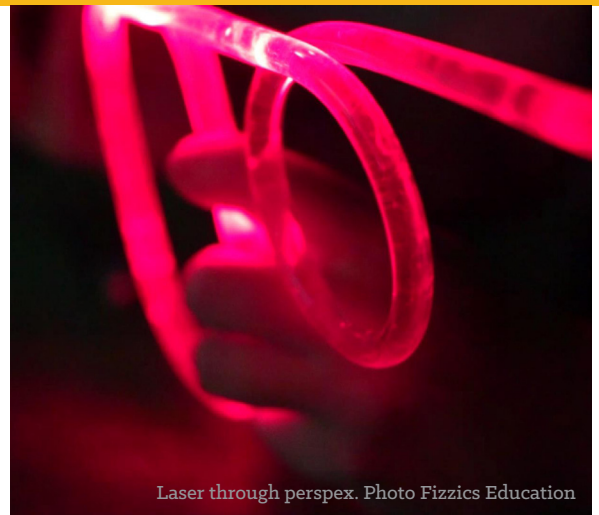
**Tip:** When promoting your event, use the language of your audience, not necessarily your words.

## Design for accessibility

Differently abled audiences are less likely to engage through the internet because of barriers to access. When designing virtual events start planning early to ensure the broadest possible accessibility. Include people with different abilities in your team including presenters. Check the software you are using is compatible with assistive technology. There’s an excellent step by step guide to designing virtual events from Rooted in Rights: **How to Make Your Virtual Meetings and Events Accessible to the Disability Community.**

## Accessibility tips

- Consider options to allow landline phones into your conference.
- Several web conferencing platforms allow close captioning as an automatic feed from third party services.
- Consider having someone trained in sign language to present either within your room or via shared screen.
- Sensory items can be mailed out or given as a shopping list ahead of time.
- Work with translators to present to ESL groups.
- Be aware of image release for cultural groups both within Australia and beyond.
- Not everyone has the same name for things! Be prepared for experiments to go wrong because your audience might have the incorrect items.
- When working with cultural groups, colloquialisms can confuse people (unless you take the time to go through the meaning).



Laser through perspex. Photo Fizzics Education

## Connecting with elderly people

If your event includes elderly people, consider how you could reach out to carers to help them access the platform you are using. Also be respectful of their knowledge and consider how you can share their experiences and insights in engaging them as an audience. Volume and sound clarity matters with your presentation. Ensure that your presentation is clearly audible. Consider running programs outside of traditional work times.



Giants from the past. Photo Sydney Science Education

## Connecting through culture

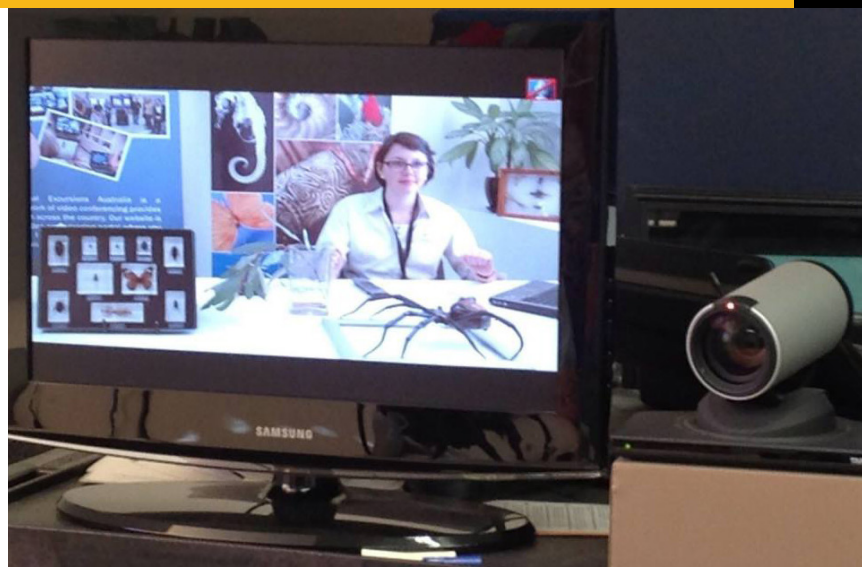
Engaging with Indigenous events is exceptionally rewarding. Look to an elder to guide you through cultural, language and behaviour expectations. Invite Indigenous participants into your discussion. You can find many resources on engaging with Indigenous groups, and you can find organisations to facilitate training for your business and staff.

- > [Australians together – Connecting locally with Indigenous Communities](#)
- > [National Indigenous Australians Agency](#)



Art workshop. Photo Sydney Science Education





Above: Minibeasts workshop. Photo Sydney Science Education. Right: Crocodile skull used to point out predator features. Halloween presentation by the California Academy of Sciences.

## How will you measure progress towards your goals?

Consider how online events/distance learning will help you achieve your goals.

Don't jump online because you think you 'should'. What goals underpin your organisation's strategy that can be delivered through online events?

**Know:** what you want the audience to do after your online event. Do you want them to sign up for a program or like your Facebook page?

**“Set clear objectives that you can measure to see if you achieved your objectives.”**

**Connect:** right tone, content and quality

- What tone is appropriate? What fits with your brand?
- What does the audience want from you?
- What language will connect with your audience?
- Who should deliver your online sessions? Use the most engaging and exciting presenter you have. Make sure they suit the target audience.
- Can people interact with you?
- How can you make it fun? Consider using polls, quizzes, Q&A, and chat to maximise interactivity.
- How will you make and keep it interesting, at the right comprehension level?
- Avoid talking heads. Consider mixing interesting speakers with showing, moving people or things and quiet time.
- Can you get everyone to DO the experiments or activities along with you, at home? People love to 'do things' with you.
- Do you need to get your audience to prepare beforehand?

### Experiments and tool kits - some useful examples:

- > [150 science experiments you can do from home \(Fizzics Education\)](#)
- > [How to get a robot to make a jam sandwich](#)

## Marketing: when should you do it?

**Before, during and after**

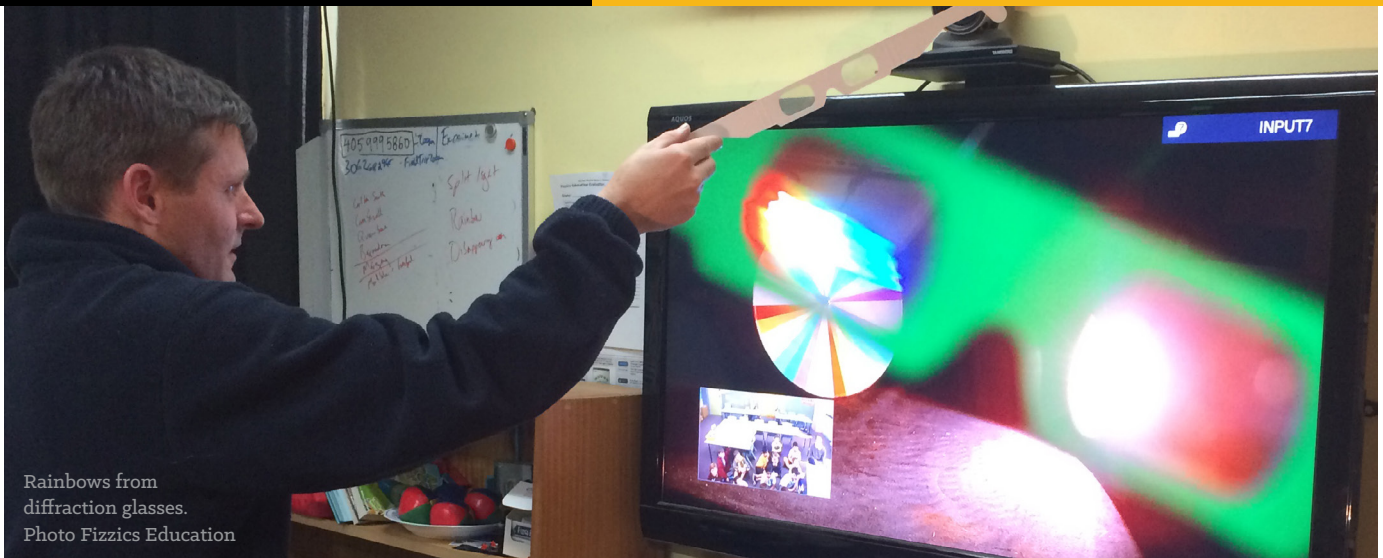
**Planning stage:** Find out what people want. (Remember there are lots of ways: You can do this through asking them on social media, website polls, emails, via phone or by providing a survey.)

**When they register:** Ask questions about what they want. It can be simple: Choose from a list of options.

**During:** If you can adapt on the fly, you can invite people to interact with you. Use the chat box: ask for a 'yes or no' answer. Facebook live: ask people to comment or use an emoji response. Gathering feedback and questions during the event can help you modify the next one.

**After:** Ask for feedback. Consider that people's time is limited so ask specific, useful questions that you will take on-board. You could do a survey or invite comments. Note if you are getting small snapshots or representative information.

**Respond:** Answer questions, provide resources. Create value for attendees. Can you leverage the content you've delivered for your public engagement and marketing efforts?



Rainbows from diffraction glasses.  
Photo Fizzics Education

## Can you really connect strongly with an audience virtually?

Energy is sparked by in-person interactions – particularly where there are opportunities to see, hear, taste, feel memorable sensations. While virtual engagement can be trickier to get right, you can potentially access millions of people.

Individuals or small centres in regional areas can connect with audiences around the world at the click of a button. This provides opportunities for the elderly, physically disabled or ill, even if they live locally they may not be able to visit physically.



Sydney Science Education staff presenting with props and live animals (spot the stick insect). Photo Sydney Science Education.

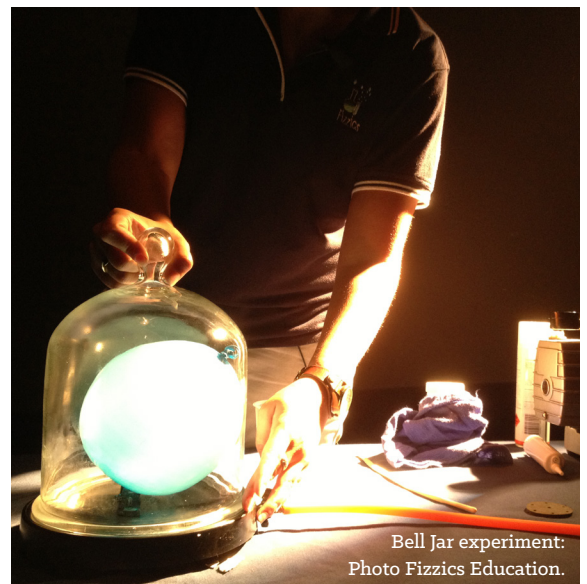
### Consider the digitally excluded — people lacking effective and affordable internet access and digital skills.

**Fact:** Around 2.5 million Australians are not online and 1.25 million households don't have the internet available. Experts say that the rapid digital transformation of government, cultural and social systems is deepening social inequality. This digital exclusion is particularly concerning for two distinct groups: older Australians and children in low-income households.

(Reference: <https://www.csi.edu.au/news/media-release-digital-equality-has-never-been-more-important-leading-academics/>)

## Top 10 tips for engaging audiences

- 1** Know who your audience is, what they are worried about, what they want
- 2** Use digital marketing tools
- 3** Use audience's language in your marketing
- 4** Have a clear message about what your online event/learning offers
- 5** Be interesting and entertaining
- 6** Communicate before, during and after the event
- 7** Focus on providing value
- 8** Ask for and take on board feedback (growth mindset)
- 9** Adapt for the next time
- 10** Be grateful that your audience have invested their time and energy to be with you.



Bell Jar experiment:  
Photo Fizzics Education.



# Fun ways to engage your online audience

Use the chat function for live poetry

Film things around you with a second camera

Use a prop as a talking point

Include video or animation to explain or entertain

Get the audience to do a scavenger hunt

Have displays around you and reference them

Utilise the web for interactive ideas eg. an electronic oscillator and homemade musical instrument

Show audience generated content

Get people to follow your actions, sing along and move their body

Encourage audience communication – but be aware of child safety requirements

Use fun apps such as Padlet, Voki or FlipGrid for visual interaction

Ask your audience to join you in an experiment

Spotlight your audience and ask them to contribute

Utilise quizzes and polls

Involve your audience in brainstorm and ideation activities

Play Bingo!

Use an on-screen timer to add some time pressure