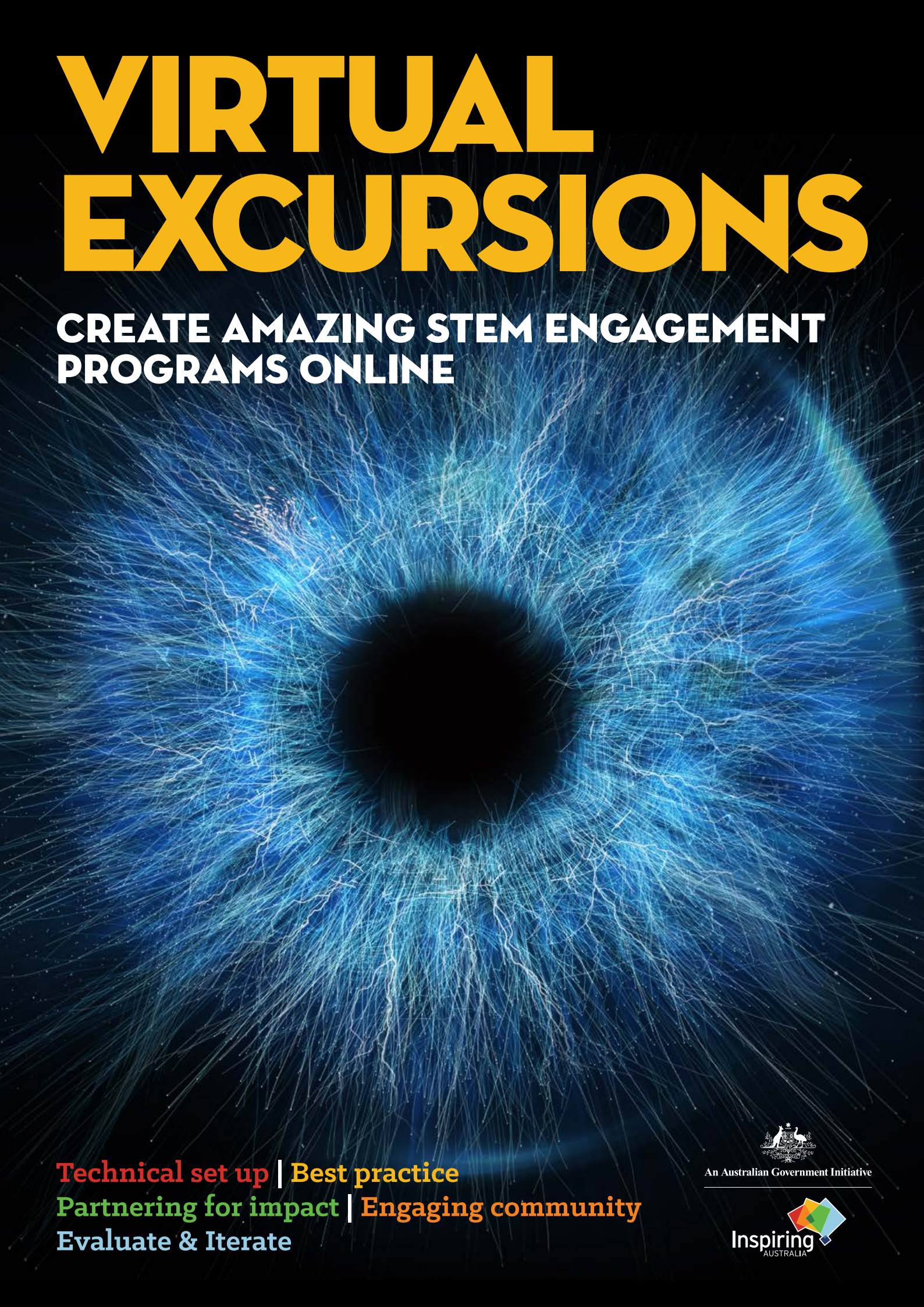
VIRTUAL EXCURSIONS

CREATE AMAZING STEM ENGAGEMENT PROGRAMS ONLINE



Technical set up | Best practice
Partnering for impact | Engaging community
Evaluate & Iterate

An Australian Government Initiative

Inspiring AUSTRALIA

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.

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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.

Part 1
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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[1]. 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.

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

Online event essentials

Online video experiences rely on four key ingredients to make them work for the viewers at home. Use this as your checklist.

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1 Have a clear strategy: Know who you are talking to, what they might enjoy (you can always test and adapt), and what you are trying to achieve.

2 Develop an effective content and delivery plan: What are you going to present? How will you make and keep it interesting, at the right comprehension level?

3 Have you got your technology sorted? Check your visuals: Everything from the speaker and their background to what you want to show your audience. Check your audio: ensure you have good quality voice amplification, any external audio set up, and avoid annoying background noise.

4 Set up safe, reliable online environment. This is about ensuring that the technology works and that you establish good practice.

5 Record your event. Even if you don't share publicly, by reviewing your work you'll get better. And if you do share it out you'll have bonus data on your audience.

Cheat sheet 1: Technical set up

Registration

> Always set up a secure registration system, and consider capturing some of your audience data. You can use registration that comes with your online tools (such as Zoom), or commonly used event registration sites like Eventbrite.

> Use a great image to brand the event that is consistent across your communications helps people to find and remember you.

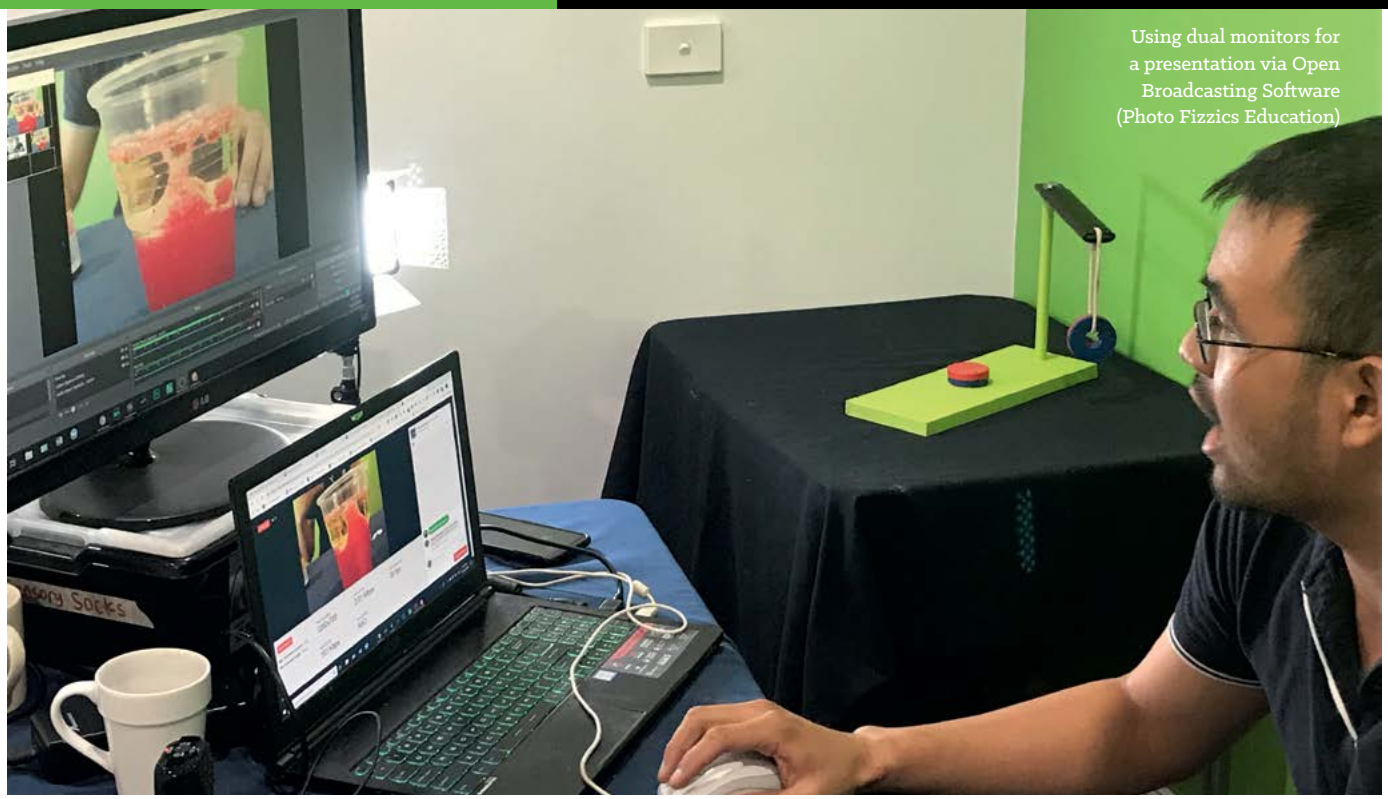
> Set automatically recurring emails to remind people about your event a week or a few days before with the registration link included.

What is video conferencing, web conferencing, live streaming?

Video conferencing is most commonly Polycom or Cisco systems. Key advantage: multiple content streams, for example a main camera, second camera or document cameras and Powerpoint presentations. Disadvantage: Traditionally difficult to connect to publicly.

Web conferencing/streaming is a software-based option contained entirely in a web browser or application. Key advantages: generally cheap and easy to access. Examples include: Zoom, Google Meets, Jitsi, Riot, Jami, Signal, Wire.

Streaming refers to one-way communication whereas conferencing means speakers and the audience can potentially interact with each other from different locations. Examples include YouTube Live and Facebook Live. If you run live events, it's always a good idea to host them online afterwards so people can refer to them later.



Using dual monitors for a presentation via Open Broadcasting Software (Photo Fizzics Education)

Worried about being on video?

More people than ever before are doing live videos and things don't always work out perfectly. No one expects perfection. Being relatable and real is more likely to help endear your audience to you. Practise makes perfect – try it out on your friends, family or colleagues and be open to feedback.

Technology - Where to start?

1. Choose a web software platform that works for your audience. Think about your own capacity to manage and host people online, and how you want to manage your audience interaction.

2. Check that your chosen application or software connects with your A/V technology and won't be blocked by internet security or firewalls.

3. Use easy timezone conversion tools, consider when people will most likely participate and put date and time information together for example: Monday 5 June, 16:00 AEDT.

4. Check your network and internet: For video conferencing, check that you have an IP address. Make sure your internet is fast and reliable.

5. Cameras: Will you have more than one? Ensure your video system connects with a good audio system. At least have a good quality USB camera with a built-in decent microphone and consider a light. Consider a versatile videoconferencing camera with pan tilt and zoom. A lot of the great camera work is about good set up - making sure the camera can focus, and setting your room up with interesting props that you can use as an alternative to 'talking heads'.

6. Audio: If you're doing a webinar, the audio may be good enough on a new laptop. Next level up: a headset microphone or a good Bluetooth microphone. Reduce echo where possible, for example with soft furnishings. (see Ensuring excellent audio, p7)

7. An ethernet cable connected to a computer is always better than WiFi.

8. If you can, reduce the amount of internet being used during the conference. This means not having services such as Netflix, YouTube or other similar high-bandwidth heavy applications happening at the same time as your conference.

9. Type 'speed test' into Google to run an internet speed test that will identify any site issues. If you have a video conferencing system, their diagnostics will allow you to look deeper into the speed of the data and as well as data loss.

10. Do technical checks on everything days before. If you're using video conferencing, use a Videoconferencing Test Site service.

11. On the day, log on early to test everything (see Before you begin, p9).

12. Have a backup if everything fails for example an email or social media post drafted ready to send. Ensure speakers are aware of the backup plan.

Green screen with a TV to one side for presenting at the Aquarium of the Pacific. **Below:** Using an iPad as a document camera (photos Fizzics Education)

Technical
set up extensions

• Consider a dual monitor if you have one. One monitor is for your presentation and the other is for applications that you would want to share (such as internet site). A second monitor is ideal for running advanced sessions via production tools such as Open Broadcaster Software (OBS).

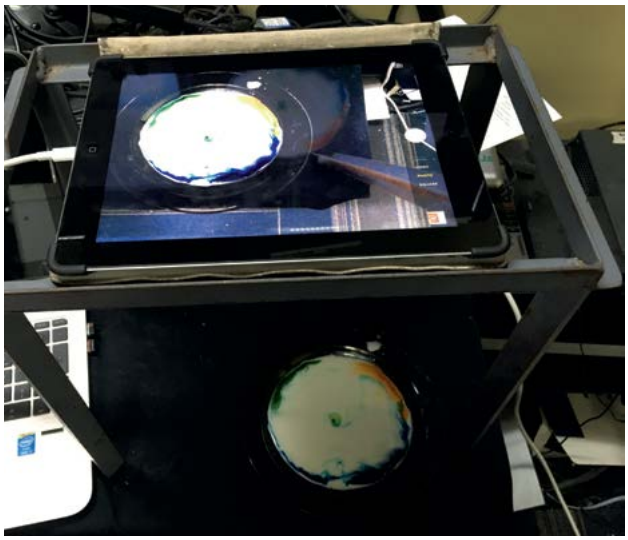
• If you have a video conference system, connect a computer to your system with a HDMI or AV connector. You'll then be able to share all sorts of content with your audience. You can also use an adapter to connect to your iPad so that you have a document camera with extra functionality.

• If you're planning on using a virtual background, double check that your backdrop is one continuous colour. You don't have to paint a wall green, you can also use fabric (use material that is not shiny). Avoid wearing colours that are close to your backdrop colour.

• When adjusting your camera, try to fill the screen as much as possible with people rather than with the table, chairs, walls, lights, or the floor.

• You can use a video switcher to move between devices quickly during a presentation. Test that this works prior to going live.

• Learn how to toggle the various layout views from self-view and gallery view. The self-view option allows you to see exactly what the audience is seeing and you can simply toggle back to the active speaker view so you can see the other people when they are speaking.



Ensuring
excellent audio

• If you are planning on presenting from a noisy environment, you can use a headset microphone. This is also handy for keeping the volume of your voice the same no matter where you turn your head.

• Set up soft furnishings around your presentation area. Hard surfaces and empty rooms create echoes on the microphones. The more sound proofing you have, the better quality of sound you'll acheive.

• If you are presenting outdoors, use a windsock, a foam cap that fits over the mic. You can also put a 'Deadcat' over the windsock for additional noise blocking.

Setting up lighting

• Lighting is crucial. Get the right balance of light on the presenter's face and anything else you're showing. Soft, cool hues work best. Reduce shadows by pointing multiple lights around you, and onto your demonstration area.

• Avoid sitting with a window behind you (avoids you being seen as a silhouette). If there are windows in the room, close any drapes or blinds. Daylight is a variable light source and can conflict with interior room lighting.

• Try to avoid 'back-lighting' from harsh light sources as you will come across as a shadowy figure with your face hidden.

• Use soft lighting for both the background and foreground.

Lighting within the Challenger Learning Center, NY (Photo: Fizzics Education)

Prep the presenters

If it's just you:

• Know the order: ensure that you have a way to keep to your schedule. If you're staying in the one room, have post-it notes on the wall.

• Have a remote mouse and keyboard at the table near you. That way you can access photos and applications easily. It's useful to have a Google page open so that you can look things up on the fly as needed. Additionally, it can be helpful to have the batteries easily accessible so that if you run out of charge on your mouse or keyboard you can quickly change them over.

• Consider your voice. Convey appropriate emotions and excitement. Or do you want to offer a calm experience? Whatever you do, don't be monotone; it's boring.

• Use your words mindfully – choose interesting, positive words and try to limit "umms and ahhhs".

• If presenting from a computer, consider adding a second camera. This will allow for more dynamic presentations as well as give you flexibility to have a close up of items.

• If you're a presenter in a shared space, consider having a sign outside that lets people know that you're 'on air'.

Sessions with multiple presenters and panels

• Brief your panel and co-presenters before the event. It's useful to have a shared document with the session details, everyone's roles and the rundown of the event.

• If you're on a panel, keep your microphone muted until invited to speak by the presenter. Mute your microphone directly after speaking.

• If your internet 'drops out', simply redial into the conference using your meeting link.

• If you are using chat for questions, consider having an extra person as an assigned moderator to help you answer, check and facilitate questions and answers.

Using a second camera for a close-up of an Alka seltzer lava lamp (Photo Fizzics Education)

Creating
a safe environment

As an event runner, keeping your audience and staff safe is critical.

1. Keeping staff safe: this is basic OHS. Ensure staff can't accidentally hurt themselves or someone else during the event.

2. Keeping the audience safe:

- Use a conference platform that is password protected.
- Only allow audio and video from participants during private, closed events.
- Make sure the host has the ability to turn off videos/audio or remove individuals.
- In public programs, all text chat should go through a moderator and never become instantly viewable to the audience.
- Big no-nos: Screen or file sharing and private chat between kids – this is an avenue for cyberbullying.
- Ask people to not share their last names.
- Make sure all moderators and presenters have a Working with Vulnerable People permit and know how to safely set up and manage a safe online environment.

3. Cyber safety: use software platforms that are as safe as possible from hackers.

4. Always have protocols in place if you need to cut the video or audio as a result of an unauthorised video bomber or something going wrong.

Polycom and Tandberg conferencing microphones (Photo: Fizzics Education)

Before you begin

- Close down the tabs on your browser that you don't need and close all other applications that you are not using.
- Ensure that you control the mute function for yourself and others. All participants should be muted at the start.
- Have experiment materials ready on a table away from your electronic devices.
- If you have an external microphone that connects to your device, have this connected and selected for use. For microphones not fixed to the ceiling or table, ensure they are at least 1 metre away from the video conference camera/endpoint and not near any other electronic equipment, otherwise audio will be severely affected.

Next:
Best practice in engaging audiences

Engaging your community with your STEAM event involves far more than watching a talking head. Learn how to make the most of your resources and talent and seek feedback to actively engage your audience and appropriately target online programs that community audiences will want to participate in. Evaluate your success and iterate!
Register here: bit.ly/2yrStoQ