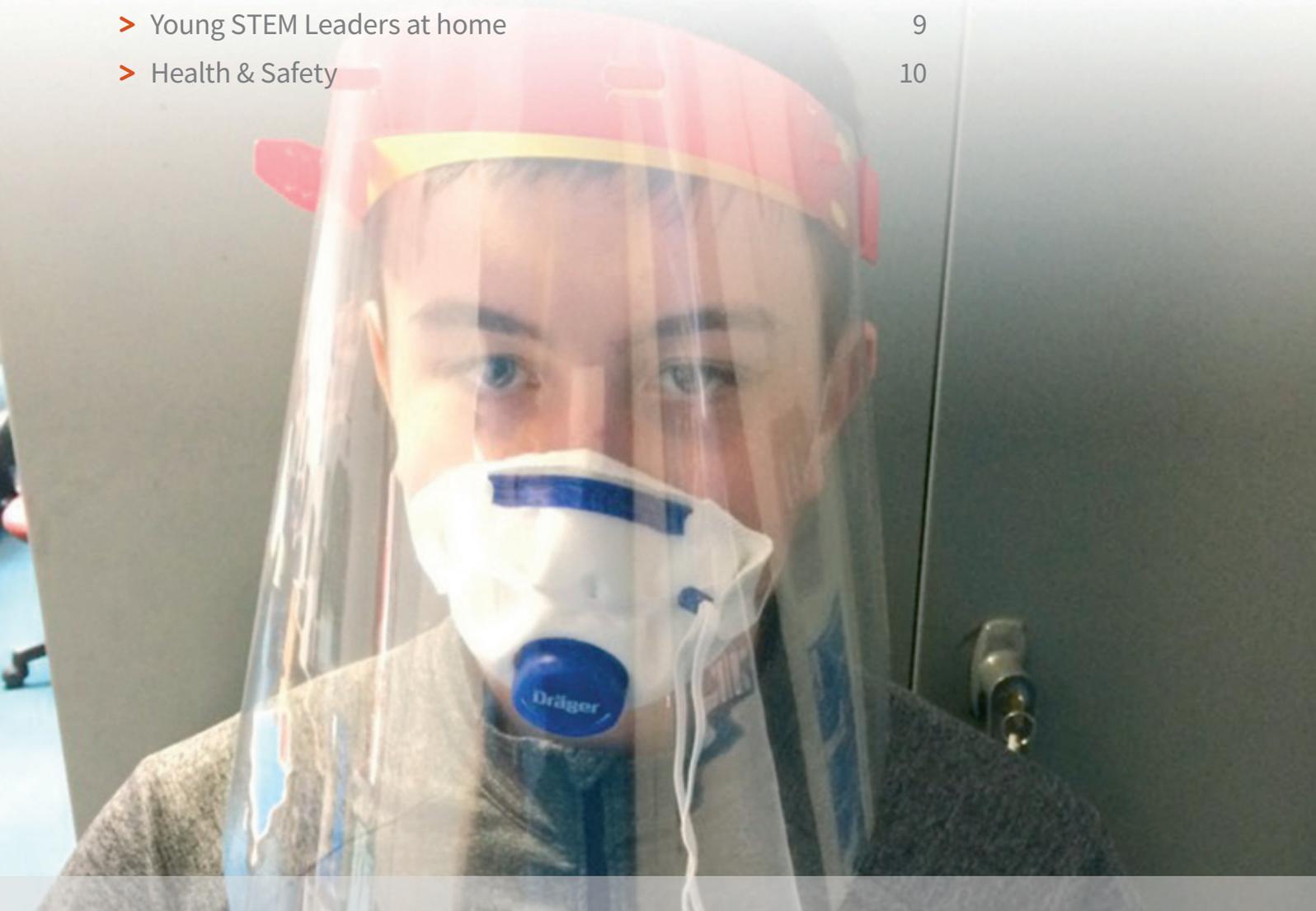


# STEM bulletin

Supporting STEM for all Local Authorities through advice, ideas and inspiration

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# Adapting to COVID-19

COVID-19 has undoubtedly had a significant impact on all aspects of life as we know it. We have grown used to using terms such as physical distancing, shielding, lockdown and furloughing in our daily conversations. Education and training, like so many other sectors, has had to adapt to an everchanging set of circumstances and political decisions and indeed will need to continue to do so.



Our lives are certainly different now; what has not changed is that we are all in this together. Individual decisions will impact on us all, but together we can try to make a positive difference. What may be seen as an inconvenience today could be a lifesaver for someone else tomorrow.

At SSERC, we have continued to serve the STEM education community in Scotland, despite all the challenges associated with the pandemic by providing you with:

- SSERC Home Learning pages on the SSERC website.
- SSERC online professional learning activities.
- SSERC TV.
- Return to school guidance supporting early years, primary and secondary education establishments.

Our commitment to you is to continue to offer a unique range of products and services designed to support Scottish STEM education as illustrated through our entirely reconfigured professional learning offering for the period August 2020 to March 2021.

We want to thank the medical professionals, the caregivers, the supermarket workers and truck drivers, as well as the countless others - including the education community - for their hard work and personal sacrifice for our collective benefit. Working together our 'new' normal will return, and we can make it better than what went before. It's up to us all to stay safe and to be proactive in helping one another amid COVID-19. <<

*Alastair MacGregor*

Alastair MacGregor - CEO SSERC

## East of Scotland STEM Ambassador Hub

Working with employers, organisations & education

Over 1,600 STEM Ambassadors

Supporting Angus, Clackmannanshire, Dundee, Edinburgh City, East Lothian, Falkirk, Fife, Midlothian, Perth & Kinross, Scottish Borders, Stirling and West Lothian.

Delivering over 19,000 Volunteering hours\*  
to schools and non-school groups (\*in 2019).

Providing engaging & inspirational STEM opportunities for young people



STEM Ambassador East SSERC



email [sae@sserc.scot](mailto:sae@sserc.scot) website [www.saesserc.scot](http://www.saesserc.scot)

   STEM Ambassadors in Scotland

# The STEM Ambassador Programme in Scotland



**Did you know that there are thousands of volunteers across Scotland ready to help bring STEM subjects to life?**

The STEM Ambassador Programme works with individuals, employers, organisations, schools and non-school groups to create opportunities to showcase STEM. STEM Ambassadors are volunteers from a wide range of different backgrounds at different stages of their careers, from apprentices and students to people who are retired after 40 years in a STEM industry. STEM Ambassadors volunteer to support learning, by delivering a careers talk, running an activity, helping to deliver a demonstration or by providing a broader context to a STEM subject.

As part of their National 5 Laboratory Science course, learners at Kinross High School would typically have been visiting workplaces. The COVID-19 pandemic made workplace visits impossible, so they sought the support of STEM Ambassadors who provided a range of job profiles from



engineering to forestry; all designed to give an insight into the variety of career options available within the laboratory science sector.

The great thing about the STEM Ambassador Programme is that it can support learning both in the classroom and online. As a teacher, you can advertise an activity you would like an Ambassador to support. It doesn't even need to be a live online event; STEM Ambassadors can contribute in many different ways, including sending videos, career profiles or activity suggestions.

The programme is available to teachers and schools for free through the STEM Learning website [1].

When registered, you have access to a range of free resources and CPD opportunities. If you would like to know more about some of the volunteers participating in the programme, check out our STEM Ambassador Spotlights [2]. There's also a link to access the STEM Ambassador Teacher Handbook [3].



## References

- [1] <https://www.stem.org.uk/stem-ambassadors>.
- [2] STEM Ambassador Spotlights is available at <https://www.saesserc.scot/spotlights>.
- [3] STEM Ambassador Teacher handbook is available at [https://a920d81d-ab3b-43f5-8706-ca5f81813d8e.filesusr.com/ugd/d688f4\\_c6efb9fd05ec4dfa92614dc689cd892b.pdf](https://a920d81d-ab3b-43f5-8706-ca5f81813d8e.filesusr.com/ugd/d688f4_c6efb9fd05ec4dfa92614dc689cd892b.pdf).

# Kitchen physics

An experiment that students can carry out at home as an exercise to get them to observe and discuss their thoughts.

## Equipment

- Kitchen Scales
- Glass or plastic cup
- Spoon

It's more of a way to get students to observe and discuss their thoughts than gain curricular knowledge.

## What to do?

Place the scales on a flat surface away from anything that might be damaged by any spillage and switch on. Place a glass  $\frac{3}{4}$  full of water on the scales as shown in Figure 1.

Ask some questions. What would the reading on the scales be if a bottle top with a 5p coin were floated on the water in the glass? More, less the same (Figure 2)?

Try it out. Carry out the experiment.

What would be the reading on the scales if we placed only the bottle top and 5p coin on the scales (Figure 3)?

Now remove the bottle top and coin and place a spoon in the glass of water (Figure 4).

Ask some questions. Why has the reading on the scales increased?

Now what do you think the reading on the scales would be if we suspended the spoon partially submerged (not touching the sides or bottom of the glass) in the water (Figure 5)?

Ask some questions. Does the mass of water change when the spoon is suspended in the water?

So what's happening? We're used to seeing pictures and diagrams showing the effect of the buoyancy force in reducing the apparent



Figure 1

weight of a mass suspended in a fluid. In most of these diagrams the 'system' consists of the water and suspended mass. Clearly the spoon is displacing water; taking up space that water could occupy and experiencing a buoyancy force equal to the weight of the displaced water. If we extend the system to include the scales the downward force is that of the water, the displaced water and the glass. >>



Figure 2 - What is the reading on the scale?



Figure 3 - The bottle top and coin placed on the scales.



Figure 4 - Place a spoon in the glass of water.



Figure 5 - The spoon partially submerged.

### A BGE Explanation

Did you notice that when the bottle top was floating it had sunk into the water a little? If you add another coin, it will sink deeper (Figure 6). Add too many coins and it will no longer be able to float.

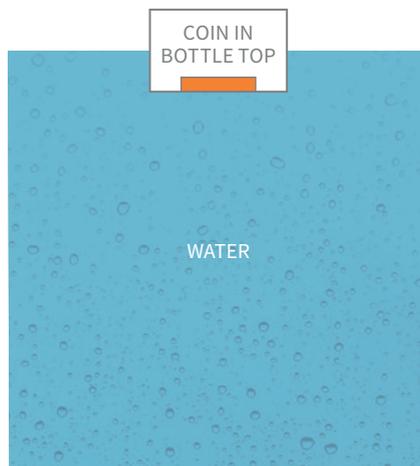


Figure 6 - Bottle top slightly sunk after adding the coin.

There are two forces on the floating object - the force of gravity (also known as weight) acts downwards and the buoyancy force acts upwards (Figure 7). Anyone who has ever been in a swimming pool will have felt this buoyancy force. When leaving a bath or swimming pool we no longer have a buoyancy force from the water on us and therefore 'feel heavier'.

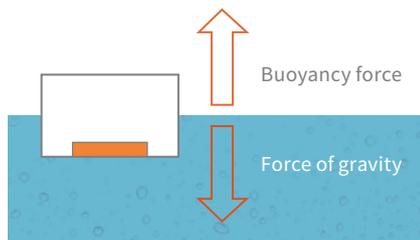


Figure 7 - The two forces on the floating object.

### In a nutshell:

- Displacing water creates a buoyancy force.
- The buoyancy force is equal to the weight of the displaced water
- If you can't displace enough water to balance the force of gravity, you sink completely.

If you were standing on a set of bathroom scales and someone gave you a book to hold, you would expect the reading on the scales to go up because you were supporting an additional object. Similarly, when the water is supporting a floating bottle top and coin, the reading on the balance increases. When the spoon is suspended in the water it displaces some water so there is still a buoyancy force on it even though it is being held. Again, because the water is (in this case partially) supporting an object, the reading on the balance goes up.

### Other things to try

- Try dissolving some salt in the glass of water.
- Notice the new reading on the scales (Figure 8).
- Repeat the suspended spoon experiment (make sure you lower the spoon to the same level as before, Figure 9).

Compare the difference in readings in this experiment with the previous experiment.

Why do you think the readings are different? <<



Figure 8 - New reading after dissolving some salt in the glass of water.



Figure 9 - Repeat the suspended spoon experiment.

# Professional learning at SSERC

Life has changed for everyone in this time of COVID-19 and so it is that life at SSERC has changed too. The SSERC team (mostly working from home) have been busy reconfiguring courses so that they can be delivered online via ZOOM, or Adobe Connect, as 'SSERC\_meets', or through self-study components, or face-to-face at SSERC where social distancing guidelines permit.

## Face-to-face

For example, many of our technician courses are competence based and involve practical assessment which can only be carried out face-to-face with small numbers of delegates. For face-to-face courses we will put in place appropriate measures at SSERC to allow social distancing, hand-cleaning and suitable lunch arrangements to keep people safe.

## Self-study & online sessions

Some courses can be completed via self-study modules. Others have self-study components such as prior reading, or a 'Gap Task' to be completed by delegates at home, or in their school.

Where funding allows, for example in the case of ENTHUSE funded courses, we may be able to provide resources to support learning back in delegates' schools. For some online sessions we may send small amounts

of kit, so that delegates can carry out practical activities at home, or in their school during the online session.

We are hopeful that as the academic year progresses, it will become possible for a greater proportion of course delivery to happen face-to-face at SSERC. We will keep this under review and, as result, our professional learning programme may yet be subject to change. <<

## SSERC Biology - learning from home

Over the years the Biology Team at SSERC has worked in partnership with colleagues from external organisations such as the research institutes and universities, to develop resources which support learning and teaching in schools. As well as producing resources, some of these colleagues have also delivered sessions at our professional learning events. As part of SSERC residential courses, teachers of biology have also visited some of these institutions and met the researchers who work there.

At the beginning of 'lockdown' we were in touch these colleagues with a view to gathering resources that might be useful to teachers and learners working from home. As a result links to a variety resources were placed on our 'Biology Home Learning' page [1].

There you will find activities for younger secondary learners, senior phase learners and for teachers.

We are grateful to all the contributors who include: The Centre for Regenerative Medicine; University

of Edinburgh School of Biological Sciences; University of Glasgow; SAPS; Easter Bush Outreach Centre, Roslin; Wellcome Trust Genome Campus and others. <<

### Reference

[1] <https://www.sserc.org.uk/biology-home-learning/>



# SSERC professional learning courses



We offer professional learning events for teachers in both the primary and secondary sectors and for school technicians. Many of our events receive funding from the ENTHUSE Bursary scheme or the Scottish Government. For many courses, bursaries will help towards covering course costs and allow us to provide delegates with resources to support learning and teaching back in their schools. Face-to-face courses will take place at SSERC with appropriate social distancing.

Courses available for online booking include:

COURSE NAME	RESIDENTIAL?	DATES	CLOSING DATE	SECTOR
<b>Environmental Science*</b>	Online & Face-to-face	1 October 2020 & 5 November 2020	31 August 2020	Secondary
<b>Optical Radiation</b>	Self-study	9 October 2020	9 October 2020	Secondary Physics
<b>Electrical Safety</b>	Self-study	9 October 2020	9 October 2020	Secondary H&S
<b>Mobile Devices</b>	Self-study	9 October 2020	9 October 2020	Secondary Physics
<b>Physics Safety</b>	Self-study	9 October 2020	9 October 2020	Secondary Physics
<b>Engineering Bench Skills*</b>	Face-to-face	28-29 October 2020	4 September 2020	Secondary Technology
<b>Chemistry for Advanced Higher*</b>	Online & Face-to-face (Feb)	2-4 November 2020 26-27 February 2021	25 September 2020	Secondary Chemistry
<b>Health &amp; Safety</b>	Online	9, 16, 23 November 2020	2 October 2020	Secondary
<b>Science for Secondary Probationers*</b>	Online	3 December 2020 & 3 February 2021	30 October 2020	Secondary Science
<b>Practical Techniques for Recently Qualified Biologists*</b>	Face-to-face	23 February 2021 & 25 May 2021	8 January 2021	Secondary Biology

\*This course attracts ENTHUSE funding which offsets the course fee.

Please check our website pages at <https://www.sserc.org.uk/professional-learning/calendar/> for the most up-to-date details on our career long professional learning calendar.

Courses are available for online booking at <https://www.sserc.org.uk/course-online-booking-form/>  
**Courses may be postponed due to the COVID-19 situation.**



## Secondary Technicians & Teachers

COURSE NAME	RESIDENTIAL?	DATES	CLOSING DATE	SECTOR
Safe Use of Fixed Workshop Machinery	Face-to-face	9-10 September 2020	19 June 2020	Secondary Technicians
Refresher: Safe Use of Fixed Workshop Machinery	Face-to-face	2 October 2020	1 September 2020	Secondary Technicians
Introductory Physics	Face-to-face	28-29 October 2020	29 September 2020	Secondary Technicians
Safe Use of Fixed Workshop Machinery	Face-to-face	4-5 November 2020	1 October 2020	Secondary Technicians
Maintenance of Fixed Workshop Machinery	Face-to-face	10-12 November	8 October 2020	Secondary Technicians
Safety in Microbiology*	Online & face-to-face	10-13 November 2020	7 October 2020	Secondary Technicians
Health & Safety & Risk Assessment	Face-to-face	17 November 2020	23 October 2020	Secondary Teachers & Technicians
Intermediate Physics	Face-to-face	18-19 November 2020	9 October 2020	Secondary Technicians
Hot & Cold Metal Forming*	Face-to-face	18-19 November 2020	2 October 2020	Secondary Teachers & Technicians
Working with Radioactive Sources	Face-to-face	24 November 2020	26 October 2020	Secondary Teachers & Technicians
Refresher: Safe Use of Fixed Workshop Machinery	Face-to-face	2 December 2020	2 November 2020	Secondary Technicians
Safe Use of Smaller Workshop Machinery	Face-to-face	8-9 December 2020	6 November 2020	Secondary Technicians
Safe Use of Fixed Workshop Machinery	Face-to-face	20-21 January 2021	4 December 2020	Secondary Technicians
Chemical Handling	Face-to-face	16-17 February 2021	12 January 2021	Secondary Technicians
Wood Turning*	Face-to-face	24-25 February 2021	8 January 2021	Secondary Teachers & Technicians
Electrical Safety & PAT	Face-to-face	10-11 March 2021	25 February 2021	Secondary Technicians
Centre Lathe Turning*	Face-to-face	24-25 March 2021	20 February 2021	Secondary Teachers & Technicians

\*This course attracts ENTHUSE funding which offsets the course fee.

More information on each course can be found at <https://www.sserc.org.uk/professional-learning/technicians-clpl/>

## Computing Science & Digital Skills

COURSE NAME	RESIDENTIAL?	DATES	CLOSING DATE	SECTOR
Enhancing creativity across the curriculum with iPad	Self-study	14 January 2020	15 June 2021	Primary
Going further with Scratch	Self-study	5 March 2020	15 June 2021	Primary
Laying the foundations of computing science	Self-study	3 September 2020	15 June 2021	Primary
Capturing learning using digital tools	Self-study	30 October 2020	15 June 2021	Primary & Secondary
Block based coding for beginners	Self-study	3 November 2020	15 June 2021	Primary
Introduction to Microbits across BGE	Self-study	25 November 2020	15 June 2021	Primary & Secondary
Introduction to G Suite for Education	Self-study	2 February 2021	15 June 2021	Primary & Secondary
Movie making & Photography with iPad	Self-study	18 February 2021	15 June 2021	Primary & Secondary
iPad Introduction to Garageband	Self-study	15 February 2021	15 June 2021	Primary & Secondary

\*This course attracts ENTHUSE funding which offsets the course fee.

More information on each course can be found at

<https://www.sserc.org.uk/professional-learning/secondary-clpl/digital-clpl/>

Courses are available for online booking at <https://www.sserc.org.uk/course-online-booking-form/>  
**Courses may be postponed due to the COVID-19 situation.**



# Young STEM Leaders at home

Did you do any cooking or baking today? Did you drive a car, pay for something at the shops or take a selfie? How about painting your nails, watching TV or lighting a candle? STEM is all around us - and sometimes we don't even realise it.

This is one of the key principles of the Young STEM Leader Programme (YSLP). By completing the award at any level, it is hoped that Young STEM Leaders (YSLs) can share examples of STEM where it may not be obvious, widening the context for others within their learning community. As well as allowing YSLs to develop important leadership, communication and employability skills, working towards a YSLP Award will also motivate young people to progress their STEM studies and perhaps eventually embark on a career in STEM.

## TRY THIS

- 1) Set a 60-second timer.
- 2) When the timer starts, find an object in your home that:
  - Is linked to STEM;
  - Needed STEM skills or techniques to create it;
  - Is used in a STEM career.
- 3) Note down all the links to STEM from the object, from its design and manufacture to how it is used by you and others.

You won't need to look far to find exciting stories and information about how STEM is relevant to all of our lives.



## Completing the award remotely

Since lockdown in March, over 150 YSLs have completed the award at SCQF Level 6 - the highest level of the programme - with all or part of the award done from home. In completing the award, every STEM leader delivered an activity, event or interaction to others - and this can be possible (and sometimes even more engaging) remotely! Many YSLs had already delivered their activities, events or interactions in their centres and generated the rest of their remaining evidence at home.

The YSLP is very flexible to suit the needs and requirements of your centre, whether you are continuing with remote, blended or face-to-face learning, there are still countless opportunities for YSLs to inspire, lead and enthuse their peers in STEM.

## Moving towards the next academic year

There are now five levels of the programme available to young people across Scotland, and we already have more than 400 delivering centres in 30 local authorities participating in YSLP.



Young STEM Leaders from Monifeith High School in Angus were involved in 3D printing face shields for NHS Tayside.

If you'd like to become a trained Tutor Assessor and deliver the programme in your school, youth group or community group, register for training at [www.youngstemleader.scot/events](http://www.youngstemleader.scot/events) or get in touch at [youngstemleader@sserc.scot](mailto:youngstemleader@sserc.scot) <<



Young STEM Leaders from Notre Dame High School in Inverclyde proudly showing off their SCQF Level 6 certificates.

## Keep it clean!

**It is likely that enhanced hygiene measures will be with us for some time to come. Your employer will have risk-assessed your school situation and put in place a policy. Health and safety law says that you must follow your employer's guidance and nothing in the following article should lead you to think, "I don't need to do that because it's not part of SSERC's guidance." Rather, what we're saying is that if your employer tells you to do X, this is how you might comply in a practical setting.**

### **We will discuss at the following topics:**

- Hand hygiene
- Equipment
- Work surfaces
- PPE

### **Hand hygiene**

This is first on our list for a reason as it is the most important of all the likely control measures in a school, and will probably be 'last person standing' as restrictions are gradually removed. Soap and warm water is best for hand washing but could be difficult to implement in a classroom that has anything approaching normal occupancy. Even if a lab or workshop has a number of sinks, it is likely that only one of them has warm water. There are ways round this, and we elaborate in our online document [1] but it is likely that hand sanitiser will be seen as a more practical solution if the class is full. The school may decide to issue each pupil with their own sanitiser, or sanitising stations may be set up in individual classrooms or at work stations. Note that students with dirty or greasy hands should still use soap and water. There is no problem with students sharing a sanitiser dispenser - they will be cleaning their hands immediately after using it.

Alcohol-based or alcohol-free? If you use a sanitiser with at least 60% alcohol it will be effective. Some alcohol-free sanitisers are also effective but buyers will have to check whether or not a particular alcohol-free product is suitable.

If alcohol-based hand sanitisers are used, the bottles should be kept well away from any sources of ignition and no naked flames should be used for several minutes to avoid possible ignition and burns.

### **Equipment**

It is possible that infection levels will be low enough that only good hand hygiene will be required in the lab or workshop. If this is not the case and your employer requires you to minimise the risk of transmission that might occur through sharing equipment, there are two approaches to consider. Equipment can be cleaned with a suitable wipe after each use. This is likely to be relatively straightforward for items such as power supplies, hand tools and so forth, but less so for fiddly items such as crocodile clips and connecting leads. Flammable sprays should, of course, never be used where there is any chance of ignition. Glassware used for chemistry experiments should be cleaned between uses anyway so no additional measures are required. Normal dishwashing either manually or in a dishwasher will be sufficient.

Rather than being wiped down, equipment could be quarantined. 72 hours is the recommended period. It would be a rare practical department that could operate with anything approaching normality if swathes of equipment were unavailable for three days at a time, but this might be a suitable approach for the aforementioned 'fiddly' items.

Note that computer keyboards and even touch screens have been shown to operate effectively even when covered by a layer of cling film.

### **Work surfaces**

Your school will have a policy on cleaning of desks and lab and workshop benches will be covered by this. It may be that a daily clean will be seen as sufficient if case numbers are low and good hand hygiene is observed. Do not worry if benches are old and gouged - we have assessed the additional risk to be small. Correspondents have asked whether giving each pupil a large sheet of paper to cover their work area at the beginning of a lesson, with it being disposed of at the end of class, is suitably safe. It is, but we would query whether it was any less time consuming or costly than wiping down between lessons.

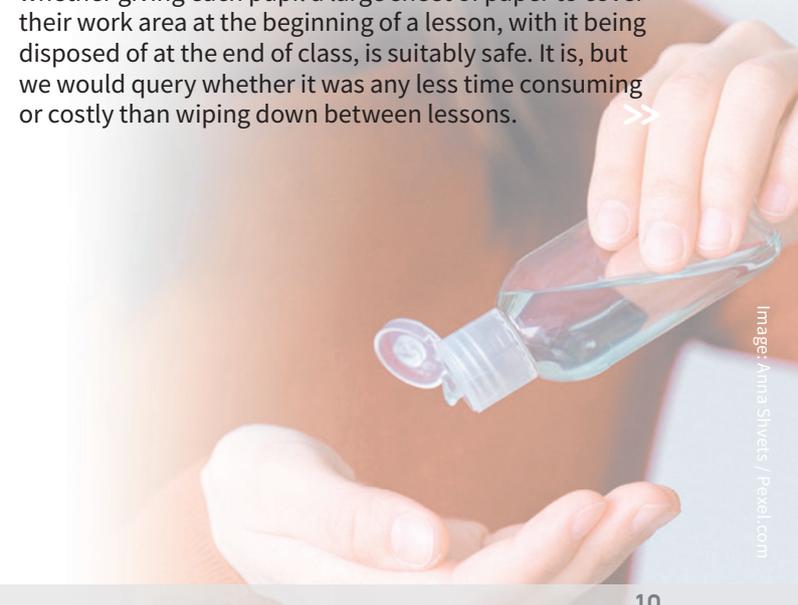


Image: Anna Shvets / Pexel.com

## PPE

Our online guidance document [1] discusses all relevant PPE and suggests suitable sterilising solutions. Here we will focus on eye protection. Sharing an item of eye protection between learners, be it a pair of safety glasses, indirect vent goggles or a face shield, should not happen unless the equipment is sanitised between wearers. As with hand-washing, this is a control measure that is likely to outlast most others. In an ideal world, every learner would have their own eye protection, labelled and kept in school. This is not a scenario that is likely to be commonplace. Indirect vent goggles with elasticated straps are the most problematic. The only really effective way is to fully immerse them in sterilising solution for 15 minutes, rinse them and allow to dry.

The real problem here is with the straps taking time to dry. A solution that will work for some designs at least is to make a strap for each learner using elastic and two bulldog clips. The straps are kept (separately) for each learner and the facepieces can be cleaned and dried more rapidly (or with an antiviral wipe). Details can be found here [2].

Having said that, indirect vent goggles are only required for activities involving corrosives and toxic chemicals. Safety glasses are fine for many activities and whilst the procedure for sterilising goggles is also appropriate for safety glasses, the latter could also be cleaned with an antiviral wipe and left to dry. If eye protection is used only infrequently, a 72 hour quarantine regime could be employed.



The above issues can be mitigated to an extent in some cases by changing the experiments, reducing concentrations for instance, such that eye protection is no longer needed.

Teachers should have their own set of PPE. This can be sterilised at the end of the day and left to dry overnight. <<

## References

- [1] **More guidance:** The coronavirus situation is fluid - for the most up to date SSERC guidance, please go to <https://www.sserc.org.uk/health-safety/covid-19-back-to-school/>. The guidance there is also more comprehensive. Please do not hesitate to get in touch ([enquiries@sserc.scot](mailto:enquiries@sserc.scot)) if you have any questions about issues raised in this article.
- [2] <https://www.sserc.org.uk/wp-content/uploads/2020/09/Eye-Protection-and-Practical-Work.docx>.

## Storage of hand sanitisers

Understandably, hand sanitiser fluid is much in evidence these days. Equally understandable, employers are keen to buy in bulk to reduce the costs.

There is, however, a problem with this strategy that seems to have been overlooked, that of storage.



The law is clear. Under DSEAR (the Dangerous Substances and Explosive Atmospheres Regulations) flammable substances in the workplace (including sanitiser) must be stored suitably. This means either in a flammable cabinet or (preferably) in a suitably constructed flammable store. Most chemical stores (if constructed according to our guidance) do meet these requirements even though they usually have cabinets in as well.

Containers placed around the school are exempt from this as they are classed as 'out for use'. But larger quantities can pose a problem - we recently heard from a school that had a delivery of 1750 litres!

This is a matter that employers will need to consider, ideally before the purchase of large quantities of sanitiser. <<

## There's no place like home

The COVID-19 situation has brought the issue of carrying out practical work in and around the home to the fore but it's not just a global pandemic that might prompt out-of-school practicals. Other scenarios include fire damage to a school building, prolonged severe weather or the extended absence of an individual.

A school technology room or science lab is certainly not a 'place like home'. It is a closely supervised environment with a number of safety features built in. Those supervising are highly trained. There is obviously no guarantee that this situation exists in the average home. Risk assessments for school practical work will have to be reviewed to determine whether additional control measures are needed in the home, or indeed whether the activity is entirely unsuitable for the home environment. Be particularly aware that an activity that is viewed as low risk in a school may require additional control measures to reduce the risk to the same level in a home setting.

### Factors to take into account when reviewing risk assessments

#### Does the activity require PPE?

If so, then it almost certainly should not be carried out at home by younger students. PPE is usually the least favoured option in industrial environments because it requires people to be responsible enough to wear it. In schools, the level of supervision is such that we can rely on PPE for protection. That level of supervision will not necessarily exist at home.

#### Does the activity involve equipment or materials that require special storage?

If so, the activity should not be carried out at home, but bear in mind that small quantities of materials may be safe enough.

#### How will kit be transported home?

It would not be appropriate for students to transport craft knives home, for example. If chemicals are to be used, can they be transported safely?



### Consider younger siblings and cognitively-impaired adults

The materials may be safe enough for use by the student, but what about others in the household who may have access to them? Please see the section on Parent/Carer Involvement.

### Environmental considerations

Are any of the materials or products harmful to the environment. If so, how will they be recycled or disposed of?

### Don't make assumptions regarding the safety of equipment/material already in the home

There are plenty of things on supermarket shelves that are not considered safe for use by children, even when supervised - dual voltage hair dryers, dishwasher tablets etc.

### Something doesn't suddenly become dangerous just because it's used in the context of an experiment

Children put vinegar on their chips without resorting to PPE. There is no need for them to wear it when experimenting with small quantities of vinegar. Nobody wears safety glasses when making a coffee. >>

## Results of risk assessment

There are three possible scenarios:

- The activity can go ahead - no control measures are required. This would be the case, for example, if only tools such as scissors were being used, or chemicals such as sugar or salt.
- The activity can go ahead provided certain control measures are in place.
- The activity is not suitable for home.

## Parent/Carer involvement

If an activity requires control measures, parents and carers should be informed in advance and their active consent sought. We do not recommend that you send a 'five steps' (as was) risk assessment form home. Simply describe the equipment being sent home and the purpose of the activity. List any hazards. Bullet-point the control measures. It is probably best not to use the phrase 'control measures' as it will not be familiar to many people. 'Safety instructions' is fine. The parent or carer can then decide if the activity can be carried out. Point out to the parent that the activity has been assessed as appropriate for the pupil if they follow safety instructions. Materials supplied are not necessarily suitable for use by other members of the household, for example younger siblings, adults with dementia. One of our correspondents pointed out that the presence of pets could be a factor.

## Making activities safer

This practice is already widespread in practical science and technology. We use small quantities of chemicals in low concentrations where possible and low voltages for experiments involving electricity. These measures can slow down processes, but that may not be an issue for a pupil working at their own pace at home.

## Packing and transporting material

The factors to consider here are fairly obvious:

- Use containers that will not break.
- Protect sharp points, e.g. using a cork.
- Use tape over the ends of batteries to avoid shorting.
- Label individual containers and apply any necessary warning symbols.



In the case of a pandemic, material can be wiped with sanitiser. Alternatively, it can be bagged and left to quarantine for 72 hours before being distributed to pupils. A zip-lock bag containing the materials for the activity and instructions could be used. Equipment which has been returned can be left in a tub and quarantined for 72 hours.

## In summary

If you propose that pupils carry out practical work at home:

- Review risk assessments.
- Liaise with parents and carers if control measures are necessary for significant hazards.



## SSERC self-study courses

In the latter part of 2019, SSERC tried out what for the organisation was a new type of professional learning – the self-study course. Strictly speaking, the format was not wholly new as optional self-study modules were incorporated in the last round of our physics Blended Learning course.

The difference this time was that our Optical Radiation Safety course was entirely stand-alone. Optical radiation was chosen as, while it is an essential topic with significant safety issues to consider, we felt that it would not be a priority for schools when it came to releasing staff or paying for a face-to-face course. No charge was levied for the self-study course. The structure of this professional learning initiative was as follows:

- Interested teachers and technicians applied for the course in the usual way.
- Successful applicants were sent links to a course folder that contained a course guide, documents on the safe use of optical radiation, a series of self-check quizzes and corresponding answers.
- Contact details of a course tutor were given.

Participants were directed to read a section of the safety documentation, attempt a quiz, then check their answers. Once the entire documentation had been read and self-assessed, they carried out an assignment. They were required to perform an experiment and list the control measures they put in place. Assignments were sent to the named tutor who would often engage in a dialogue with the course 'attendee'.

The pilot was well-received, and a further self-study course was scheduled for development in session 2020/2021.

### Along came coronavirus.

#### Our response was two-fold:

- 1) We had begun a second run of the Optical Radiation Safety course, but it was clear that staff would have little or no access to labs and equipment. Hence, our first action was to alter the requirements for the assignment, making it necessary only to describe an activity that could be done in school and to list the control measures that, were you able to carry out the activity, you would put in place.

- 2) Secondly, we fast-tracked the development of two more physics safety courses and modified one of the Blended Learning self-study units in order to make it generally available. For the first time in over a decade, the Physics Teacher Summer School that we run jointly with the Institute of Physics (IOP) in Scotland had to be cancelled. Undeterred, our IOP Scotland partners gave us funding to supply equipment for a further two courses to support a Virtual Summer School initiative.

Feedback indicates that this support has been valued by the profession. The following quotes are typical:

*"This course has been a really good way for myself and my team to do some very constructive work while the world has gone a bit crazy so thank you."*

*"...thoroughly enjoying all the content being provided online via SSERC and the IOP. Feeling very supported and valued."*

To find out more about our self-study health & safety [1] and self-study Physics [2] courses, please visit our website.



#### References

- [1] <https://www.sserc.org.uk/professional-learning/secondary-clpl/health-safety-clpl/>.
- [2] <https://www.sserc.org.uk/professional-learning/secondary-clpl/physics-clpl/>.