

## Ventilation and heating

*[Updated guidance excerpt – to be included in revised school reopening guidance]*

38. This section of the guidance was updated on 12<sup>th</sup> October to take account of colder weather during autumn and winter. It has been informed by the latest scientific and public health advice and research from the advisory sub-group on education and children's issues, Health Facilities Scotland, ARHAI Scotland and other expert groups. Cognisance has also been taken of UK and European building services industry guidance ([CIBSE](#) and [REHVA](#)). This guidance has been developed in consultation with HSE.

39. This section of the guidance is intended primarily for relevant local authority teams – it is not expected that headteachers or teachers should have the expertise to apply it independently.

40. The key requirement for local authorities is to work with schools to identify and implement local approaches that balance the need for fresh air in key parts of the school estate with the maintenance of adequate temperatures. The latest scientific advice identifies that ventilation is an important factor in mitigating against the risk of far-field (>2m) aerosol transmission. The importance of far-field aerosol transmission is not yet known, but evidence suggests it is a risk in poorly ventilated spaces.

There is therefore a need for an appropriate supply of fresh air to assist with minimising the risk of virus infection. There is also a need to maintain indoor temperatures for reasons including user comfort, health and wellbeing, and learning and teaching.

This guidance seeks to identify practical measures which may be incorporated to balance these issues. The precise balance to be struck, and the most effective ways of doing so, will depend heavily on local factors including building design, location and prevailing weather conditions. It is expected that average external temperatures will drop over the winter months, and also that average wind speeds will rise (c30-40%) compared to summer. The rise in wind speed will increase the need to reduce draughts by closing (or partially closing) windows. The increased speed may however provide some compensation in terms of maintaining overall ventilation rates.

41. Measures to improve ventilation should be viewed as just one part of the overall package of control measures in schools. Schools should continue to ensure a focus on implementation and maintenance of wider controls including personal hygiene, enhanced cleaning and distancing.

42. Relevant local authority teams may already be in a position to provide the necessary expert advice to schools on appropriate local approaches to the assessment of current ventilation and the development of strategies to improve ventilation. Where any necessary expertise is not available within a local authority, they may wish to draw on expert external advice to inform their strategies - some local authorities have already done so, and are sharing this expertise through their national networks. In providing advice, local authorities may wish to consider grouping school buildings by common criteria (e.g. type of construction, primary/secondary/ASN, window type, heating system, etc.) and developing a package of viable options in consultation with trade unions and staff in those schools.

43. Schools should ensure that risk assessments are updated appropriately for the autumn/winter period, in consultation with local authorities, staff, trade unions and (where applicable) PFI/NPD providers, to consider issues around ventilation and heating/warmth that are relevant to their specific environments. Drawing on local authority advice, they should

consider areas of the school where air flow (including pockets of stagnant air in occupied spaces) and/or temperature may be problematic, and the strategies that may be used to address these issues and mitigate risks appropriately. Some examples of potential approaches are provided in paragraph 45 below.

44. Schools should as a minimum ensure that adequate levels of ventilation and appropriate temperatures are maintained, with reference to the [School Premises Regulations](#). While minimum requirements vary depending on the specific part of the school estate, for classrooms the regulations stipulate 2 air changes per hour and a temperature of 17°C. Reference should also be made to the [Workplace \(Health, Safety and Welfare\) Regulations 1992](#) minimum temperatures.

#### 45. Natural Ventilation and Temperature

The primary effective method of increasing natural ventilation remains the opening of external doors, vents and windows. Wherever it is practical, safe and secure to do so, and appropriate internal temperatures can be maintained in line with statutory obligations, this approach should be adopted. Keeping doors open (again, with appropriate regard to safety and security) may also help to reduce contact with door handles.

However, internal fire doors should never be held open (unless assessed and provided with appropriate hold open and self-closing mechanisms which respond to the actuation of the fire alarm system). The Fire Safety Risk Assessment should always be reviewed before any internal doors are held open.

As noted above, schools are also required to maintain internal temperatures and conditions in line with statutory obligations (see the School Premises Regulations and the Workplace (Health, Safety and Welfare) Regulations 1992.). It is recognised that in the autumn and winter, schools are therefore unlikely to be able to keep external doors and windows open as often, or for as long, as in warmer weather periods.

Scientific and public health advice is that measures to introduce fresh air can have a beneficial impact on virus suppression. Schools should therefore be supported to adopt strategies that help balance requirements for ventilation with internal temperatures and conditions. Expert advice identifies that using pragmatic approaches which recognise the importance of user comfort may help overall behavioural adherence to guidance in relation to ventilation.

Potential approaches, the suitability of which will depend on a range of local factors including weather conditions, may include:

##### Ventilation

- partially opening doors and windows to provide ventilation while reducing draughts
- opening high level windows in preference to low level to reduce draughts
- purging spaces by opening windows, vents and external doors (e.g. between classes, during break and lunch, when a room is unused, or at other suitable intervals if a space is occupied for long periods at a time)

##### Temperature

- providing flexibility in permissible clothing while indoors. Support for parents in relation to additional clothing may be available in some circumstances (see, e.g. <https://www.mygov.scot/best-start-grant-best-start-foods/>). Local authorities should be

aware of the needs of staff who may be unable to access clothing appropriate to local strategies adopted.

- designing seating plans to reflect individual student/staff temperature preferences. This is an approach which has been trialled in some schools and proven to be a useful measure when used in combination with other strategies.
- adjusting indoor heating to compensate for cold air flow from outside (e.g. higher system settings, increased duration)

#### 46. Mechanical ventilation

Where it is not possible to keep doors and windows open while maintaining appropriate internal conditions in line with statutory obligations, and centralised or local mechanical ventilation is present, systems should wherever possible be adjusted to full fresh air. Air recirculation should be avoided or minimised. If this is not possible while maintaining appropriate internal conditions, systems should be operated to achieve statutory requirements as a minimum.

Additional points to assist with the practical delivery of this approach include:

- Where ventilation units have filters present enhanced precautions should be taken when changing filters. Additional advice on filters can be located in the REHVA Covid guidance.
- Ventilation systems should be checked or adjusted to ensure they do not automatically adjust ventilation levels due to differing occupancy levels.
- Consider starting mechanical ventilation ahead of school day and allow it to continue after classes have finished.

#### 47. Fans

Fan heaters, fan assisted heating systems or air conditioning within a single space may assist in maintaining appropriate temperatures, provided there is an adequate supply of fresh air into the space. This approach should only be used where the balance of adequate ventilation and appropriate temperature cannot be achieved otherwise. Filter maintenance should also be carefully undertaken as noted above. Care should be taken to avoid unregulated use of ad hoc devices which may cause increased risk in terms of electrical load, inappropriate installation, cable trip hazard and potential fire or electrocution risk.

#### 48. CO2 Monitors

Local authorities should consider whether CO2 monitors may play a useful role in their overall ventilation monitoring strategies, particularly in areas of the school estate that are identified as higher risk or of concern. It is important that local authority advice is sought on the use of monitors to ensure their proper specification, installation, location, calibration and effective use.

CO2 monitors detect the amount of CO2 in a space, which will increase if adequate ventilation is not provided, thereby prompting user intervention such as opening a window or vent. Some schools will have these installed already while others may, in consultation with relevant local authority teams, choose to use portable devices for periodic or ongoing monitoring in areas where particular risks are identified. The most recent scientific advice and research is that an upper level of 1500 ppm should be used to identify and prioritise multi-occupancy, regularly-used areas for improvement.

This scientific advice and research also indicates that indoor spaces where there is likely to be an enhanced aerosol generation rate (e.g. loud singing/drama, indoor PE when permitted) should aim to ensure ventilation is sufficient to maintain CO2 concentrations at lower levels (a figure of

800ppm is provided), and should also include additional mitigations such as face coverings for audiences and restricting the size of groups and duration of activities. This advice will be factored into consideration of any wider advice on restart of these activities.

Local authorities should consider how to apply lessons learned from parts of the estate with CO2 detectors installed in other parts of the learning estate. This could be achieved both between schools within a local authority and also by sharing data between local authorities.

Relevant local authority teams should provide clear advice on the appropriate use of CO2 monitors, including procedures to be followed by staff in the event of inappropriate levels being indicated. These should be proportionate and pragmatic, and help ensure both safety and continuity of education. They may include, for example, contact with relevant local authority teams to discuss approaches to improving ventilation in the event of concerns being identified.

49. School operators (e.g. councils, leisure trusts, third parties, etc.) should also be aware of additional guidance in relation to ventilation of sports and leisure facilities which may be applicable within school buildings e.g. community use of gyms, fitness rooms, sports halls etc.

<https://www.gov.scot/publications/coronavirus-covid-19-guidance-on-sport-and-leisure-facilities/pages/operational-guide-and-checklist/>

#### 50. Implementation

Local authorities and schools should, in consultation with staff and trade unions, ensure there are clear plans for effective implementation of local strategies. Key points to consider may include:

- Clarity on responsibility for implementing approaches, with due regard for workload;
- Provision of instruction or signage, etc. to support implementation (e.g. with clear instructions for window/door/vent opening and mechanical system operation);
- Pragmatic, proportionate procedures to be followed in the event of any concerns around ventilation or heating. Local authorities may wish to ensure that contact details are provided for relevant local authority teams or health and safety officers.

#### 51. Sharing of good practice

Local authorities are committed to sharing good practice and expert advice across national networks, including the ADES Resources network and SHOPS. Local authorities are currently modelling practical approaches to implementation of the strategies in this guidance in order to achieve the regulatory requirement of 2 air changes per hour in classrooms, and the findings of this work will be shared across networks as soon as they are available.

This section of the guidance will kept under careful review and updated in light of emerging practice.