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| **HEALTHY SCHOOL POLICIES** | | |
| **NURTURE A CULTURE OF HEALTH, SAFETY AND SHARED RESPONSIBILITY** | 1 Provide training for teachers, staff, students and parents/guardians  2 Begin each day reinforcing health messaging and by checking for symptoms daily. All teachers and students with symptoms must not attend school.  3 Display signs reminding of rules, roles and responsibilities  4 Regular staff meetings to evaluate progress of COVID-19control strategies  5 Share weekly reports with parent and students and reminders of their roles  6 Encourage behaviors that reduce risk of getting COVID-19 outside school hours  7 MOE should provide a set of standardized training materials to ensure the health messaging is uniform, accurate and up to date |  |
| **FORM A COVID-19 RESPONSE TEAM AND PLAN** | 1 A team must be responsible for implementing and disseminating COVID-19 policies  2 Should be able to perform preliminary and rapid contact tracing  3 Ensure all staff are aware of privacy policies regarding COVID-19 status disclosures  4 Able to increase staff surge capacity by recruiting student teachers, community volunteers  5 Ensure adequate facilities to wash hands, hand sanitizers and regular cleaning of common touch items  6 Ensure all mitigation measures and infrastructure are in place prior to reopening |  |
| **PRIORITIZE STAYING AT HOME WHEN SICK** | 1 Inform students and staff to stay home if feeling unwell  2 Request daily self-declaration that one is free of symptoms  3 Identify a sick bay for those who are unwell to isolate prior to returning home |  |
| **PROMOTE TESTING** | 1 Encourage testing if one is unwell, even if mild and track progress  2 Incorporate testing into future plans  3 Provide information where one can go for testing | It would be ideal when affordable RTK-Ag tests are available/affordable that they are done weekly |
| **PLAN OF ACTION FOR A POSITIVE CASE** | 1 Develop an action plan to deal with a case in school  2 Liaise with the Health Centre (PKD) on the time frame for the case and their close contacts to resume school  3 Check regularly with the MOE and MOH website for updates and guidelines |  |
| **SUPPORT ON-LINE LEARING** | 1 Source and provide supplies and support systems for on-line learning  2 Train staff on how best to facilitate on-line learning |  |
| **CULTURE OF PHYSICAL DISTANCING IN PRACTICE** | 1 Limit parent and visitor access  2 Move PIBG meeting online  3 Where not critical on site, promote work from home especially in areas with high community transmission rates  4 Staff meetings via videoconferencing |  |
| **PROTECT HIGH RISK STUDENTS AND STAFF** | 1 Advocate them for online learning or work  2 Take extra precautions if they attend school |  |

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| **HEALTHY CLASSROOMS** | | |
| **WEAR MASKS** | 1 All students, teachers, administrators, parents & visitors must wear masks in all classroom and non-classroom settings, including hallways, school offices, restrooms, gyms, auditoriums, etc.  2 Train how to wear, care and dispose masks  3 Masks must meet criteria – offer both good filtration as well as a good fit  4 Masks should be provided FOC to B40 students |  |
| **WASH HANDS FREQUENTLY** | 1 Before and after entry into class, eating, touching shared objects, using toilet, after coughing/sneezing/blowing nose/touching face mask  2 Hand sanitizers should be available at the entry/exit of each class  2 Use hand sanitizer when washing not possible (60% ethanol or 70% isopropanol) |  |
| **PHYSICAL DISTANCING** | 1 Minimum Six feet between persons  (Evidence now that this is inadequate when staying indoors for a longer period.  https://www.pnas.org/content/118/17/e2018995118)  2 As far as possible  3 Fixed seating arrangements in classrooms possible  4 Use other school space as temporary classrooms (eg halls)  5 If possible, move class outdoors  6 Replace hugs/handshakes/high- with smiles/waves/thumbs up |  |
| **MINIMIZE GROUP GATHERINGS** | 1 Keep class group distinct and separate (class bubble)  2 Limit movement/mixing between class bubbles  3 Stop/avoid large groups eg extracurricular and sports activities  4 Avoid having any assembly gatherings |  |
| **LIMIT SHARING OF OBJECTS** | 1 Select lesson plans that limit student contact  2 Provide students with own separate supplies  3 Provide disposable disinfectant wipes if using shared objects |  |
| **Environment cleaning and disinfestation** | 1 Clean high touch surfaces daily and between different sessions of students.  2 This includes tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, and sinks. |  |
| **TEACHER’S STAFF ROOM** | 1 Work stations should be 3 feet apart  2 Preferably with plexiglass shielding  3 Minimize contact with common user items  4. Stagger meal times to reduce crowding in staff room  5. Ensure that suraus limit the number of personnel at each time. Ensure cleanliness and good ventilation in the surau. No sharing of telekungs, prayer mats |  |
| **HEALTHY SCHEDULES** | | |
| **MANAGE SCHOOL TIMINGS AND MOVEMENTS** | 1 Stagger arrival and departure times  2 Set up separate entrances and exits for different groups of students when possible. Label entrance and exit doors to provide one-way traffic.  3 Mark lines and direction of travel on the floor to encourage distancing  4 Consider installing thermal sensor at entrances to screen visitors. |  |
| **MAKE LUNCHTIME SAFER**  Meal times are very risky times as masks come off.  Suggest shorten school hours and avoid meals completely | 1 Eat lunch in classrooms, consider having lunch outdoor when circumstances allow.  2 Stagger lunchtimes if eaten in shared lunchrooms. Clean surfaces between groups.  3 Maintain distancing (6 feet/2m) whilst eating lunch  4 Pack all meals. Canteen should provide packed meals FOC for B40 children  5 Reinforce no sharing of meals, utensils, drinks  6 Shorten lunch breaks to 15 min |  |
| **RETHINK TRANSPORTATION** | 1 Open all windows on the bus, van, car when it does not create a safety or health hazard.  2 Reduce numbers in each bus, van, car to ensure distancing  3 Adjust school opening times to allow students using public transport to avoid rush hour  4 Encourage walking, cycling, use of personal vehicle  5 Encourage group family transport by families. |  |
| **ADJUST ATTENDANCE** | 1 For effective class bubbles, class sizes must be reduced.  2 Consider splitting the class into 2 cohorts attending school separately to achieve this  3 Longer hours of shared space will enhance viral transmission. Consider reducing school hours to prevent this  4 Allow flexibility in attendance policies as situation changes  5 If community spread metrics exceed targets, adjust attendance before moving to online learning.  6 Consider hybrid learning  7 Prioritize face-to-face learning for youngest students  8 Some children may be fearful of returning to school in the face of an ongoing pandemic. Access to both physical and electronic school would be good. |  |
| **LIFT** | 1. Limit riders with social distancing and facing away from each other. Wear a mask, don't talk unless absolutely necessary (talk softly)  2. Turn on elevator cab (lift) ventilation fans, where possible.  3. Encourage students to take stairs, where possible, especially when elevator lobbies are crowded. Provide signage to encourage physical distancing.  4. Allow elevators to run at high speed to minimize time in elevators.  5. Consider change elevator door from normal closed to normal opened, where possible. |  |
| **Stairs** | 1. If two stairs or more are present, consider one-way traffic.  Turn on fans (e.g. stairwell pressurization), if available. |  |

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| **HEALTHY ACTIVITIES** | | |
| **ALLOW RECESS** | 1 Stagger recess times. If necessary, separate classes by play area  2 Wash or sanitize hands before and after recess or using high-touch equipment  3 Increase supervision to limit high-risk behaviors |  |
| **MODIFY PHYSICAL EDUCATION (PE)** | 1 PE should be outdoors as much as possible with physical distancing.  2 Limit the amount of shared equipment and shared spaces  3 Select PE activities which limit close contact  4. Stop/avoid using indoor gym or PE activities  Maintain 6 feet distance during activities that increased exhalation occurs, such as singing, shouting, band, or sports and exercise. Move these activities outdoors or to large, well-ventilated space, when possible. |  |

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| **HEALTHY BUILDINGS** | | |
| **INCREASE OUTDOOR AIR VENTILATION** | 1 Allow more fresh outdoor air into classrooms and other indoor spaces.  2 Increase outdoor air supply rate to 10 L/s/person if the system can accommodate this.  3 Open all doors and windows at all times unless outdoor air quality is poor or poor weather or poses a safety or health risk (such as falling, expose to extreme temperatures or triggering asthma symptoms)  4 Switch on fans to promote air circulation.  5 Use child-safe ventilation fan to increase the air change in the room. Safely secure fans in a window to blow potentially contaminated air out and pull new air in through other open windows and doors. The fan speed should ideally meet the space noise level target of 35 dBA.  6 Off Air Conditioner when doors and windows are opened. |  |
| **ENSURE VENTILATION SYSTEMS IN GOOD WORKING ORDER** | 1 Check ACMV system provide adequate ventilation in all indoor spaces  2 Maximize outdoor air intake & supply by setting AHUs or the similar to maximum speed and capacity  3 Deactivate demand control systems e.g. those with CO2 sensors to avoid automatic reduction of outdoor air supply  4 Open all outside air dampers  5 Ensure balanced outdoor air distribution to all occupied spaces  6 Operate exhaust fans e.g. in toilets, kitchens, at full capacity to expel air from indoor spaces.  7 Consider installing additional exhaust fans if inadequate  8 Maintain ACMV systems regularly  9 Consider use of portable carbon dioxide (CO2) monitors to monitor the ventilation condition in classrooms and other spaces. . High CO2 levels >1000 ppm indicate poor ventilation or overcrowding. If the CO2 level exceed 1000 ppm, consider increase the ventilation rate or reduce the number of occupants in the building.  10 Check AHUs or the similar daily to ensure continuous operation  11 Check all supply air diffusers and exhaust grilles to ensure correct air flow direction  12 Check other systems to ensure no undesired air leakage into occupied spaces e.g. water seals in sanitary system, cracks in pipes |  |
| **BEFORE AND AFTER OCCUPYING INDOOR SPACES PURGE THE AIR** | 1 Do daily for at least 2 hours before and after the building is occupied at maximum outside airflow. Increase frequency for high risk spaces  2 Those without outdoor air supply systems, open operable windows and doors or installing ventilation fan to minimize re-circulation of air within the building and bring in more outdoor air into the building. |  |
| **MINIMIZE INDOOR AIR CIRCULATION**  **(also see appendix and table below)** | 1 Upgrade ACMV filters to minimum efficiency reporting value (MERV)-13 or the highest MERV rating a building’s ventilation system can accommodate in AHUs to treat re-circulated air  2 Set recirculation air dampers to minimum  3 Consider using portable air cleaners that use high-efficiency particulate air (HEPA) filters with removal efficiencies of 99.97% or higher for a mass median particulate size of 0.30 microns or upper-room Ultraviolet Germicidal Irradiation (UVGI) systems as a supplemental treatment to inactivate the virus that causes COVID-19-19, especially if options for increasing ventilation and filtration are limited. . Consult a qualified professional to help design and install any UVGI system.  4. Portable HEPA air cleaners can go in any room of a school building to serve as an additional safety and mitigation layer, including in areas where airflow may be limited, and/or in areas where sick individuals may be present such as a nurse’s office or sick/isolation room.  5. Avoid using any air cleaning devices with ozone generation function. Exposure to excessive ozone levels and by-products can be harmful to health. |  |
| **DOMESTIC WATER SYSTEMS FOR EXISTING FACILITIES TO REOCCUPY** | For unoccupied buildings, water systems should be flushed for a minimum periods of 5 minutes with all branch of piping opened simultaneously to remove potential contaminants from stagnant equipment, piping, fixtures, etc |  |
| **USE PLEXIGLASS AS PHYSICAL BARRIER** | Install plexiglass shielding in select areas e.g. reception, cafeteria checkout |  |
| **INSTALL NO-CONTACT INFRASTRUCTURE** | 1 Adjust present infrastructure to make it touchless  2 Install touchless technology for dispensers of soap, sanitizers, paper towels |  |
| **KEEP SURFACES CLEAN** | 1 Frequent cleaning and disinfection of common surfaces  2 Provide adequate training and protection of cleaning staff |  |
| **GOOD TOILET HYGIENE** | 1 Keep windows and/or doors open at all times, unless outdoor air quality is poor or the weather condition does not allow.  2 Operate exhaust fans at full capacity to expel air from the indoor space. Keep windows or other openings around exhaust fans closed to avoid short-circuiting of air flow.3 Install lids on toilet seat and keep them closed during flushing  4 Stagger toilet use |  |

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| **HEALTHY VACCINATED TEACHERS AND STUDENTS** | | |
| **VACCINATE ALL SCHOOL TEACHERS AND STAFF** | 1 Teachers and school staff should be given high priority in the early second phase of vaccine distribution.  2 The government should ensure all teachers and school staff are fully vaccinated before the next school re-opening  3 Since it is an essential and critical service, all school teachers and staff must be vaccinated  4 Teachers who are not vaccinated cannot be allowed to do face to face teaching |  |
| **VACCINATE ALL 12-17 YEAR OLD STUDENTS** | 1 All 12-17 year old students must be vaccinated  2 Those who are not vaccinated or refuse to be vaccinated should not be allowed in-person teaching until 90% of their classmates and school teachers and staff are vaccinated |  |

References:

World Health Organization ,2020. Considerations for school-related public health measures in the context of COVID-19-19.

https://www.who.int/publications/i/item/considerations-for-school-related-public-health-measures-in-the-context-of-COVID-19-19

<https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/ventilation.html>

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https://www.ashrae.org/file%20library/technical%20resources/COVID-19-19/ashrae-reopening-schools-and-universities-c19-guidance.pdf

<https://journals.sagepub.com/doi/10.1177/0141076821992449>

Appendix:

**Quick ‘rule of thumb’ selection guide for portable air cleaners**

* Look for portable air purifier with HEPA filter
* Look for high clean air delivery rate
* Avoid add-ons (e.g. ionizers, ultraviolet lights, ozonizer)

**Placement of the device matters**

* The calculations are based on a simple-box model that assumes equal-mixing in a room
* Avoid having air blow across individuals
* In the absence of additional information place air cleaner in the middle of the room.

**Basic for targeting 10 L/s/person from outdoor air ventilation + portable air cleaner**

* Goal is a total of 10 L/s/person
* The design standard for minimum ventilation in education settings is shown in Table 1.
* Many classrooms do not meet this minimum; a few will provide higher ventilation
* The impacts of ventilation and air cleaning are additive (e.g. ventilation of 6.7 L/s/person + air cleaning of 3.3 L/s/person = 10 L/s/person
* You can add multiple air purifiers to a room to achieve a higher ventilation rate (e.g., putting in two devices, each with 130 CFM, will equal 260 CFM)

**Understanding CADR**

* Clean air delivery rate is a combination of filter performance and also how much air passes through that filter (e.g., a device with a great filter but no air passing through is not effective)
* HEPA filters capture >99.97% of airborne particles, so look for devices with HEPA filters
* Next, look for a high CADR, which is in units of cfm, or cubic feet per minute
* CADR is determined for different particle sizes; use the smoke or dust rating

**Filter types and when to change them**

* Look for devices with HEPA filters, and change them according to manufacturer recommendations
* Many devices come with a charcoal filter. This treatment can be useful for reducing concentrations of gas-phase pollutants. This filter needs to be changed often and has no impact on viruses.

Table 1: Minimum ventilation rates in breathing zone.

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| --- | --- | --- | --- | --- | --- |
| Type of education facility | *L*/s\*person | *L*/s\*m2 | Default occupancy (per 100 m2) | *L*/s | L/s\*person |
| Classrooms (5-8 years old) | 5 | 0.6 | 25 | 185.0 | 7.4 |
| Classrooms (9+ years old) | 5 | 0.6 | 35 | 235.0 | 6.7 |
| Art Classroom | 5 | 0.9 | 20 | 190.0 | 9.5 |
| Computer Lab | 5 | 0.6 | 25 | 185.0 | 7.4 |
| Daycare sickroom | 5 | 0.9 | 25 | 215.0 | 8.6 |
| Daycare (through age 4) | 5 | 0.9 | 25 | 215.0 | 8.6 |
| Lecture Classroom | 3.8 | 0.3 | 65 | 277.0 | 4.3 |
| Lecture Hall (fixed seats) | 3.8 | 0.3 | 150 | 600.0 | 4.0 |
| Libraries | 2.5 | 0.6 | 10 | 85.0 | 8.5 |
| Media center | 5 | 0.6 | 25 | 185.0 | 7.4 |
| Multiuse assembly | 3.8 | 0.3 | 100 | 410.0 | 4.1 |
| Music/theater/dance | 5 | 0.3 | 35 | 205.0 | 5.9 |
| Science laboratories | 5 | 0.9 | 25 | 215.0 | 8.6 |
| University/college laboratories | 5 | 0.9 | 25 | 215.0 | 8.6 |
| Wood/metal shop | 5 | 0.9 | 20 | 190.0 | 9.5 |

Table 2: Top up for good and poor ventilation education facilities with air purifier to meet 10L/s/person.

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| Type of education facility | Additional Ventilation Rate Required (L/s\*person) | **Top up for good ventilation with Air Purifier (L/s)** | **Top up for good ventilation with Air Purifier (CFM)** | **Top up for low Ventilation with Air Purifier (L/s)** | **Top up for low Ventilation with Air Purifier (CFM)** |
| Classrooms (5-8 year olds) | 2.6 | **65.0** | **137.7** | **250.0** | **529.7** |
| Classrooms (9+ years old) | 3.3 | **115.0** | **243.7** | **350.0** | **741.6** |
| Art Classroom | 0.5 | **10.0** | **21.2** | **200.0** | **423.8** |
| Computer Lab | 2.6 | **65.0** | **137.7** | **250.0** | **529.7** |
| Daycare sickroom | 1.4 | **35.0** | **74.2** | **250.0** | **529.7** |
| Daycare (through age 4) | 1.4 | **35.0** | **74.2** | **250.0** | **529.7** |
| Lecture Classroom | 5.7 | **373.0** | **790.3** | **650.0** | **1377.3** |
| Lecture Hall (fixed seats) | 6.0 | **900.0** | **1907.0** | **1500.0** | **3178.3** |
| Libraries | 1.5 | **15.0** | **31.8** | **100.0** | **211.9** |
| Media center | 2.6 | **65.0** | **137.7** | **250.0** | **529.7** |
| Multiuse assembly | 5.9 | **590.0** | **1250.1** | **1000.0** | **2118.9** |
| Music/theater/dance | 4.1 | **145.0** | **307.2** | **350.0** | **741.6** |
| Science laboratories | 1.4 | **35.0** | **74.2** | **250.0** | **529.7** |
| University/college laboratories | 1.4 | **35.0** | **74.2** | **250.0** | **529.7** |
| Wood/metal shop | 0.5 | **10.0** | **21.2** | **200.0** | **423.8** |

\* Poor ventilation – The education facility has poor ventilation or you’re not sure.

\* Good ventilation - The education facility meet the minimum ventilation as per ASHRAE 62.1(2019)

Reference: Experts offer advice on air purifiers for classrooms. https://www.hsph.harvard.edu/news/hsph-in-the-news/experts-offer-advice-on-air-purifiers-for-classrooms/