



CALIFORNIA'S  
COALITION  
*for* ADEQUATE  
SCHOOL HOUSING<sup>SM</sup>

COVID-19

# Healthy Schools: Cleaning, Disinfecting, Healthy Air Quality, Scheduling and Social Distancing

A Resource for School Facility and Maintenance Departments

## PREFACE

COVID-19 has placed significant responsibility on K-12 school maintenance and facility departments to provide learning environments that are clean, safe and healthy as schools contemplate re-opening and operating in an uncertain environment. The CASH Maintenance Network (CMN) has developed this Guidebook to assist maintenance and facility departments with the fundamental elements of re-opening: student and staff safety, cleaning and disinfecting, adequate ventilation and healthy indoor air quality, social distancing and scheduling, and managing fiscal impact.



This Guidebook is intended to provide Best Management Practices (BMP) to assist school maintenance and facility departments to successfully navigate the uncertain COVID-19 environment, though it is designed to outlive the current moment as a stand-alone guide to creating safe and healthy learning environments. Successfully implementing these fundamental elements require coordination between the elements, so out of necessity there is some overlap of information and recommendations.

This Guidebook is NOT intended to provide medical analysis or health advice. All decisions about following these recommendations should be made in collaboration with local health officials and other State and local authorities who can help assess the current level of mitigation needed based on levels of COVID-19 community transmission, and the capacities of the local public health and healthcare systems, among other relevant factors.

As the Centers for Disease Control and Prevention (CDC) states: “As communities consider a gradual scale up of activities toward pre-COVID-19 operating practices in centers for learning, such as K-12 schools and summer day camps, CDC offers recommendations to keep communities safe while resuming peer-to-peer learning and providing crucial support for parents and guardians returning to work.”

The CASH Maintenance Network (CMN) is part of the Coalition for Adequate School Housing (CASH), the premier school facilities and maintenance organization in California. The CMN focuses exclusively on school maintenance issues to assist K-12 districts in providing learning environments that are clean, safe and functional. The CMN brings together experts from throughout the school industry to provide best practices so students have learning environments that support academic achievement.

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

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## HOW TO USE THIS GUIDEBOOK

This Guidebook is intended to be both a practical planning and site-level guide for school maintenance and facility departments as they look to re-open and maintain schools in the COVID-19 environment. This guidebook is organized into five sections which focus on the essential elements of re-opening schools: I) Health and Hygiene Guidelines for Staff and Students; II) Cleaning and Disinfecting Standards; III) Ventilation and Filtration to Improve Indoor Air Quality; IV) Calculating Social Distancing and Scheduling for Staff and Students; AND, V) Managing Fiscal Impact, Planning, Risk Management and Communications.

Each section includes Best Management Practices (BMP) guidance as well as additional electronic resources relevant to the section subtopic from key organizations such as: The Centers for Disease Control and Prevention (CDC), Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), and the California Department of Education (CDE), Western Cooling Efficiency Center, Energy and Efficiency Institute, UC Davis, etc. Always check to ensure you have the most recent guidance from the appropriate state and local agencies.

These tools can be used to plan, develop, implement, and maintain facilities to help ensure schools are clean, safe and healthy in the COVID-19 era and beyond.

# HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

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## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

### SECTION I: HEALTH AND HYGIENE GUIDELINES FOR STAFF AND STUDENTS

This section outlines strategies that schools may consider implementing to encourage behaviors that reduce the spread of COVID-19 and provide healthy learning and working environments. These strategies include staying at home when appropriate, hand hygiene and respiratory etiquette, cloth face coverings, adequate supplies, communication with communities, staff and students, along with signs and messages.

#### II: BEST MANAGEMENT PRACTICES: PROMOTING BEHAVIORS THAT REDUCE SPREAD

Schools may consider implementing several strategies to encourage behaviors that reduce the spread of COVID-19.

##### STAYING HOME WHEN APPROPRIATE

1. Educate staff and families about when they/their child(ren) should stay home and when they can return to school.
2. Actively encourage employees and students who are sick or who have recently had close contact with a person with COVID-19 to stay home.
  - a. Develop policies that encourage sick employees and students to stay at home without fear of reprisal, and ensure employees, students, and students' families are aware of these policies. Consider not having perfect attendance awards, not assessing schools based on absenteeism, and offering virtual learning and telework options, if feasible.
3. Staff and students should stay home if they have tested positive for, or are showing COVID-19 symptoms.
4. Staff and students who have recently had close contact with a person with COVID-19 should also stay home and monitor their health.
5. Centers for Disease Control and Prevention (CDC) criteria can help inform when employees should return to work. See the resources in this section for more information.

##### HAND HYGIENE AND RESPIRATORY ETIQUETTE

1. Have a station at the main entry of the school site where staff can take temperatures, hand out masks as appropriate, and have a handwashing station available if possible.
2. Teach and reinforce handwashing with soap and water for at least 20 seconds and increase monitoring to ensure adherence among students and staff.
  - a. If soap and water are not readily available, hand sanitizer that contains at least 60% alcohol can be used (for staff and older children who can safely use hand sanitizer).
3. Encourage staff and students to cover coughs and sneezes with a tissue.
4. Used tissues should be thrown in the trash and hands washed immediately with soap and water for at least 20 seconds.

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## CLOTH FACE COVERINGS

1. Teach and reinforce use of cloth face coverings, which are meant to protect other people in the event the wearer is unknowingly infected but does not have symptoms. Cloth face coverings are not surgical masks, respirators, or other medical personal protective equipment. Wearing a cloth mask may be challenging for students to wear in an all-day school setting. Student age should be carefully considered - a kinetic kindergartener is different than an independent senior.
2. Face coverings should also be worn by staff and students, and are most essential in times when physical distancing is difficult to achieve. Students, staff and students' parents should be frequently reminded not to touch the face covering and to wash their hands frequently, as well as on the proper use, removal, and washing of cloth face coverings.
3. Note: Per the CDC, cloth face coverings should not be placed on:
  - a. Children younger than two (2) years old
  - b. Anyone who has trouble breathing or is unconscious
  - c. Anyone who is incapacitated or otherwise unable to remove the cloth face covering without assistance
4. Cloth face coverings are meant to protect other people in case the wearer is unknowingly infected but does not have symptoms. Cloth face coverings are not surgical masks, respirators, or other medical personal protective equipment.

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## ADEQUATE SUPPLIES

1. Support healthy hygiene behaviors by providing adequate supplies, including soap, hand sanitizer with at least 60 percent alcohol (for staff and older children who can safely use hand sanitizer), paper towels, tissues, disinfectant wipes, cloth face coverings (as feasible) and no-touch/foot pedal trash cans. The state will be coordinating with the county office of education (COE) designated California Office of Emergency Services (CalOES) logistics contact to provide:
  - a. Sixty (60) days' worth of PPE, for the start of the school year, some in bulk and some phased in:
    1. Four (4) masks per child, some single use, some cloth
    2. One (1) face shield for every teacher and child care provider
    3. N-95 masks and surgical masks for school-based health professionals
    4. No touch thermometers for every school and childcare facility
    5. Roughly twelve (12) gallons of hand sanitizer for each school, arriving in gallon jugs

CalOES will be getting in touch regarding logistics to deliver the PPE. School districts may be responsible, after the sixty days, for purchasing and paying for additional PPE, but the state is going to provide procurement vehicles to purchase PPE.

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

### SIGNS AND MESSAGES

1. Post signs in highly visible locations (e.g., school entrances, restrooms) that promote everyday protective measures and describe how to stop the spread of germs (such as properly washing hands and properly wearing a cloth face covering).
2. Broadcast regular announcements on reducing the spread of COVID-19 on public address systems.
3. Include messages (for example, videos) about behaviors that prevent the spread of COVID-19 when communicating with staff and families (such as on school websites, in emails, and on school social media accounts).
4. Find free CDC print and digital resources on CDC's communications resources main page.

### III: RESOURCES

#### Health and Hygiene Guidelines for Staff and Students

##### Close Contact with Someone who has COVID-19:

<https://www.cdc.gov/coronavirus/2019-ncov/php/public-health-recommendations.html>

<https://www.cdc.gov/coronavirus/2019-ncov/if-you-are-sick/quarantine-isolation.html>

##### When Staff and Students Should Stay Home:

<https://www.cdc.gov/coronavirus/2019-ncov/if-you-are-sick/steps-when-sick.html>

##### COVID-19 Symptoms:

<https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>

##### Sick with COVID-19?

<https://www.cdc.gov/coronavirus/2019-ncov/if-you-are-sick/quarantine-isolation.html>

##### Handwashing:

<https://www.cdc.gov/handwashing/when-how-handwashing.html>

##### Cloth Face Coverings:

<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html>

##### WHO Mask Guidance - Updated June 5, 2020

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/when-and-how-to-use-masks>

##### Support Healthy Hygiene:

<https://www.cdc.gov/handwashing/when-how-handwashing.html>

<https://www.cdph.ca.gov/Programs/OPA/Pages/NR20-113.aspx>

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

### Signs and Messages

#### Print Resources:

<https://www.cdc.gov/coronavirus/2019-ncov/communication/print-resources.html?Sort=Date%3A%3Adesc>

#### Everyday Protective Measures:

<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention-H.pdf>

#### How to Stop the Spread:

<https://www.cdc.gov/coronavirus/2019-ncov/downloads/stop-the-spread-of-germs-11x17-en.pdf>

#### Posters:

<https://www.cdc.gov/handwashing/posters.html>

#### Face Covering Checklist:

<https://www.cdc.gov/coronavirus/2019-ncov/images/face-covering-checklist.jpg>

#### Announcements:

<https://www.Cdc.Gov/Coronavirus/2019-Ncov/Communication/Public-Service-Announcements.Html>

#### Social Media:

<https://www.cdc.gov/coronavirus/2019-ncov/communication/social-media-toolkit.html>

#### Communications Resources:

<https://www.cdc.gov/coronavirus/2019-ncov/communication/index.html>

## SECTION II: CLEANING AND SANITIZING STANDARDS

This section provides cleaning and disinfecting recommendations and Best Management Practices (BMP) to ensure learning environments are properly cleaned and disinfected. While many resources are provided in this section, it is always advisable to check and follow all your local public health, Centers for Disease Control and Prevention (CDC), and Environmental Protection Agency (EPA) guidelines regarding cleaning standards. Useful links for cleaning and sanitizing are included in the resource section.

### II: BEST MANAGEMENT PRACTICES

We recommend the following: 1) all staff be trained on proper dilution of any new product (if not ready to use), application, recommended Personal Protective Equipment (PPE), surface rinsing, disinfectant chemical disposal and cleanup as prescribed on the selected disinfectant label; 2) all staff wear recommended PPE (masks, gloves, eyewear, coveralls, etc.); gather all approved cleaning supplies such as disposable towels, microfiber rags, mop heads, buckets, products, trash liners, and cleaning products previously mentioned above. Items should already be stocked on custodial cart; and 3) the district-approved cleaner and disinfectant (see resources for EPA registered disinfectant approved for viral/bacterial pathogens for high touch surfaces).

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### CLEANING PROCEDURES

In addition to normal cleaning procedures:

1. Wear all PPE.
2. Clean surfaces using general surface cleaner to remove any heavy soils, dirt, organic matter and/or germs prior to disinfecting.
3. Disinfect table tops, desks, sinks, drinking fountains, and other flat surfaces using district approved disinfectant, following all manufacturer recommended instructions to ensure proper usage. If the product is a concentrate, make sure to dilute at the recommended amounts and apply to surfaces as described. It is imperative that the disinfectant remain wet and active on the surface for the prescribed dwell time. Wipe surface with clean cloth to remove any residue.
4. Wipe down all high touch surfaces from floor up to 72" which includes: door knobs/handles, light switches, HVAC controls, phones, pencil sharpeners, door jambs, walls, etc. Use district approved disinfectant.
5. For any soft surfaces using district approved disinfectant: hold bottle six (6) to eight (8) inches from surface, use smooth, zig zag motion and mist across fabric until wet (do NOT saturate). Allow fabric to air dry - bacteria will be killed in 30 seconds.
6. Refill with product and then disinfect all soap, hand sanitizer, and paper product dispensers.
7. After thoroughly cleaning all areas of room, all floors should be vacuumed, swept and mopped as needed.
8. All trash receptacles need to be emptied and replace with new liner.
9. Security check doors and windows.
10. Turn off lights (if no occupancy sensor).

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

### III: RESOURCES

#### Before Reopening

<https://www.mckinsey.com/industries/social-sector/our-insights/safely-back-to-school-after-coronavirus-closures#>

#### CDC

[https://www.cdc.gov/coronavirus/2019-ncov/community/office-buildings.html?deliveryName=USCDC\\_2067-DM29427](https://www.cdc.gov/coronavirus/2019-ncov/community/office-buildings.html?deliveryName=USCDC_2067-DM29427)

<https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/cleaning-disinfection.html>

<http://pages.thinkhr.com/rs/276-KTW-573/images/Return-to-Work-Checklist-20200421B.pdf>

[https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/schools.html?deliveryName=USCDC\\_2067-DM28938](https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/schools.html?deliveryName=USCDC_2067-DM28938)

#### Cal OSHA

[https://www.dir.ca.gov/dosh/Coronavirus/COVID-19-Infection-Prevention-in-Childcare-Programs-Guidance.pdf?mkt\\_tok=eyJpIjoiTnpaaFIqRXhaakUxWWpkbSIsInQiOiJoYWlnaVQxZm0rbWRNa2ZDOXFkSXpFWIRyXC9BTitYVGxHeFhnZkNHT3JibVV5UVdJSjFIVW43MzM2QUlzdKJZdWxlclThPSkJKNzZvTWVCVUo3cTZtaTY5aHNLcmdCnd4SktEN1NsaDdYdks2dzNUMExubjRcL3FiTHILT3QyWjNzIn0%3D](https://www.dir.ca.gov/dosh/Coronavirus/COVID-19-Infection-Prevention-in-Childcare-Programs-Guidance.pdf?mkt_tok=eyJpIjoiTnpaaFIqRXhaakUxWWpkbSIsInQiOiJoYWlnaVQxZm0rbWRNa2ZDOXFkSXpFWIRyXC9BTitYVGxHeFhnZkNHT3JibVV5UVdJSjFIVW43MzM2QUlzdKJZdWxlclThPSkJKNzZvTWVCVUo3cTZtaTY5aHNLcmdCnd4SktEN1NsaDdYdks2dzNUMExubjRcL3FiTHILT3QyWjNzIn0%3D)

#### American Institute of Architects

<https://www.aia.org/press-releases/6299732-architects-health-experts-release-strategi>

#### American Academy Of Pediatrics

<https://services.aap.org/en/pages/covid-19-landing-page/clinical-guidance/covid-19-planning-considerations-return-to-in-person-education-in-schools/>

#### How COVID-19 Spreads

<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html>

[https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/children/mis-c.html?deliveryName=USCDC\\_2067-DM28938](https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/children/mis-c.html?deliveryName=USCDC_2067-DM28938)

#### Cleaning, Disinfecting and EPE (Essential Protective Equipment) Procurement

<https://sites.google.com/marinschools.org/mcoerethinkingschools/essential-protective-equipment>

#### Cleaning Strategies

[https://spaces4learning.com/podcasts/2020/04/expert-advice-on-covid19-cleaning.aspx?s=B&oly\\_enc\\_id=4458C5076634I0Y](https://spaces4learning.com/podcasts/2020/04/expert-advice-on-covid19-cleaning.aspx?s=B&oly_enc_id=4458C5076634I0Y)

<https://www.infectioncontroltoday.com/environmental-hygiene/using-atp-healthcare-settings-0>

<https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>

<https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>

<https://www.cdc.gov/coronavirus/2019-ncov/community/reopen-guidance.html>

<https://www.epa.gov/iaq-schools/forms/master-class-webinar-how-effective-cleaning-and-maintenance-can-improve-health>

#### Disinfectants

<https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>

<https://www.epa.gov/pesticide-labels/design-environment-logo-antimicrobial-pesticide-products>

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### PPE

<https://smartairfilters.com/en/blog/whats-the-difference-between-n95-and-kn95-masks/>

<https://www.schealth.com/products/#infrared-thermometers>

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/burn-calculator.html>



## SECTION III: VENTILATION AND FILTRATION TO IMPROVE INDOOR AIR QUALITY

Properly installed and maintained Heating, Ventilation, and Air Conditioning (HVAC) systems are the key to ensuring healthy Indoor Air Quality (IAQ) in K-12 school learning environments, including installation, equipment, adjustment, maintenance, and dynamic monitoring. Healthy IAQ contributes to increased student academic performance, reduces absences due to asthma and other respiratory illnesses, and is critical to ensuring schools are safe environments for students and staff as schools contemplate re-opening and continued operation in an uncertain environment.

Research and lessons learned continue to add to the evolving knowledge and significance of IAQ in schools to ensure healthy learning and working environments, particularly as related to COVID-19. We have included Best Management Practices (BMP) to improve IAQ in schools, which includes the best thinking by schools, government agencies, academic research, and industry experts on practical approaches to IAQ in schools. We have also included in the resource section a link to the University of California, Davis study, which we believe is the most comprehensive resource for understanding the significance of healthy IAQ in K-12 schools, and includes both academic research and practical guidance.

### II. BEST MANAGEMENT PRACTICES

#### TEST, VERIFY, ADJUST AND REPAIR VENTILATION SYSTEM OUTDOOR AIR FLOW RATES

HVAC systems consist of many electrical and mechanical components. Proper maintenance of all components of this intricate system is required for the systems to operate as designed. An assessment of HVAC systems by a certified technician assures the systems are operating as designed, providing adequate ventilation and filtration. Systems can be evaluated for their ability to increase the ventilation and filtration as recommended by the Centers for Disease Control and Prevention (CDC) and American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE). These steps can help reduce the risk of transmission of infectious disease.

Systems with mechanical ventilation are typically designed with a minimum outside air ventilation rate. This value is typically indicated on the design drawings and is used during the Test, Adjust, and Balance (TAB) process to properly configure the HVAC systems. The mechanical system ventilation rate provided should be 15 CFM per person, consistent with California's Title 24 Building Energy Efficiency Standards. Over time it is not uncommon for these configured systems to fall out of "calibration." This is where a Ventilation Verification Assessment (VVA) plays an important role following new system installation, but also on a periodic basis to ensure ongoing adequate ventilation. New systems may also not meet design specifications if they were not acceptance tested, (which includes a verification of mechanical system ventilation rate) at the time of installation. The VVA should include measurement of outdoor air rates per Section B of the California Energy Commission's Outdoor Air Acceptance Test Procedures (NRCA-MCH-02-A)<sup>1</sup>, which details the functional testing procedure for outdoor air systems. Additional acceptance test procedures for functional testing of HVAC systems, economizers and demand control ventilation systems are also available<sup>2</sup>. Acceptance test procedures

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<sup>1</sup> State of California. Outdoor Air Acceptance. CEC-NRCA-MCH-02-A.  
[https://energycodeace.com/download/36500/file\\_path/fieldList/2019-NRCA-MCH-02-A%20Outdoor%20Air.pdf](https://energycodeace.com/download/36500/file_path/fieldList/2019-NRCA-MCH-02-A%20Outdoor%20Air.pdf)

<sup>2</sup> State of California. Nonresidential Certificates of Acceptance (NRCA).  
<https://energycodeace.com/nonresidentialforms>

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should be completed by trained, qualified and certified personnel. Certified acceptance testing technicians can be located on the California Energy Commission's website<sup>3</sup>.

Exhaust fans are a critical component of ventilation systems and need to work in conjunction with the introduction of outside air. All exhaust fans airflow should also be measured by a certified technician to determine if they are meeting the design requirements.

Prior to the addition of any supplementary systems, it is imperative that all systems associated with HVAC are operating in their as-designed condition. If the systems are not able to operate as-designed, or if the design is no longer proper for the usage of the space, please consider an equipment and/or system upgrade for the application. An important consideration when performing a VVA is to compare the actual occupancy to the design occupancy. If the maximum occupancy has increased or the occupant use has changed, the design ventilation and exhaust rate will need to be reevaluated.

Once an adequate ventilation rate has been established and all applicable components have been verified for functionality, upgrades to the ventilation system can be considered. This may include upgrades to increase ventilation, the installation of economizers, and Demand Control Ventilation (DCV) systems which will provide energy savings along with the benefits of IAQ.

HVAC control sequences should be evaluated to ensure all units, including exhaust, are set to operate at a minimum of one hour, and preferably two hours, before being occupied by staff and students. This will "flush" the room air prior to occupancy. Ventilation systems (i.e., ventilation fans) must operate during all occupied hours.

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### INSTALL HIGH EFFICIENCY FILTERS

Minimum Efficiency Reporting Value (MERV) is a widely accepted method of rating filters. Higher values equate to a filter that is able to capture more airborne particulates. MERV 8 is a very common filter rating for use in mechanical units in schools across California. MERV 13 filters can remove particles in the range of 0.3-1.0 microns, where MERV 8 filters are limited to particles greater than three (3) microns. A trained, skilled and certified technician should evaluate the initial and final recommended pressure drop to determine any effect of increased filtration on the unit's performance and establish a new maintenance schedule. With proper research and testing, most units can be fitted with a MERV 13 or higher, as recommended by ASHRAE. ASHRAE outlines increased filter evaluation steps within the ASHRAE Building Readiness document. Lastly, MERV 13 is also the current 2019 California Mechanical Code minimum requirement.

Filters are biologically active. Therefore, all filters should be treated as a potential health hazard when performing maintenance and replacements. Workers should wear proper Personal Protection Equipment and follow appropriate containment procedures for filter disposal.

High Efficiency Particulate Air Filters (HEPA) are the healthcare industry's standard for critical environments. Retrofitting a HEPA filter into a traditional Single-Zone Roof-Top-Unit type of HVAC system is typically not a viable option. If a need has been determined, this option can offer the highest level of filtration, however, should be implemented only in critical environments as budgetary concerns must be considered.

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<sup>3</sup> California Energy Commission. Acceptance Test Technician Certification Providers.

<https://www.energy.ca.gov/programs-and-topics/programs/acceptance-test-technician-certification-provider-program/acceptance>

If a more temporary solution is needed, a portable filtration unit can be utilized to assist with the filtration duties of the overall HVAC system. Consideration for this application is the target air change rate desired. This will determine the size of the unit required. Consider the Energy Star rating database for portable air filters; systems with a higher CFM/watt will have lower operational costs for energy consumption<sup>4</sup>.

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## INDOOR AIR QUALITY (IAQ)

IAQ consists of many factors including, but not limited to, temperature, humidity, carbon dioxide, and other airborne contaminants. Temperature and humidity are easy to feel, however, many contaminants are odorless and are not able to be detected by the human senses. The carbon dioxide (CO<sub>2</sub>) level in an occupied space has been used as an indicator of effectiveness of a ventilation system. Consider installing CO<sub>2</sub> sensors in classrooms to monitor IAQ and detect potential problems with ventilation systems. In order to be useful, the sensors must log the CO<sub>2</sub> concentrations over the course of the school day. The maximum CO<sub>2</sub> concentration should not exceed 1,100 ppm in well ventilated classrooms. For classrooms without adequate mechanical ventilation, monitoring of CO<sub>2</sub> concentrations can be used to determine if other ventilation techniques (e.g. open doors and windows) are working sufficiently. At a minimum, CO<sub>2</sub> sensors should:

1. Be hard-wired or plugged in and mounted to the wall between three to six feet above the floor, and at least five feet away from the door and operable windows.
2. Display the CO<sub>2</sub> readings to the teacher through a display on the device or other means such as a web-based application or cell phone application.
3. Notify the teacher through visual indicator on the monitor (e.g. indicator light) or other alert such as email, text, or cell phone application, when the CO<sub>2</sub> levels in the classroom have exceeded 1,100 ppm.
4. Maintain a record of previous data which includes at least the maximum CO<sub>2</sub> concentration measured.
5. Have a range of 1-2000 ppm or greater.
6. Be certified by the manufacturer to be accurate with 75 ppm at 1,000 ppm CO<sub>2</sub> concentration and is certified by the manufacturer to require calibration no more frequently than once every five years.

Spaces where HVAC systems have both economizers and DCV offer the most ability to automatically adjust to a dynamic environment.

As indoor contaminants increase (CO<sub>2</sub> levels rise) the HVAC system is able to respond and provide a higher percentage of outdoor air to the space by modulating the economizer to drive the contaminants lower (less CO<sub>2</sub>). Where a centralized Building Management System (BMS) is available, the sequence of operations can be adjusted to “purge” the space both after occupancy and prior to occupancy. This “purge” can be based on measured contaminant levels or simply triggered by schedule. Systems that are based around local HVAC controllers are still capable of sequence changes, but should be considered on a case-by-case scenario. Program DCV controllers to maintain CO<sub>2</sub> concentrations of 800 ppm since control algorithms may overshoot their programmed targets.

When using DCV systems, review logged CO<sub>2</sub> data to ensure maximum concentrations during the school day are not exceeding 1,100 ppm. If the DCV does not maintain maximum CO<sub>2</sub> levels below 1,100 ppm, it should be disabled until such time as the local education agency determines that the COVID-19 crisis has passed, unless disabling the control would adversely affect operation of the overall system. When disabling a DCV, the system must be configured to meet the minimum ventilation rate requirements and tested and adjusted.

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<sup>4</sup> ENERGY STAR Certified Room Air Cleaners. <https://www.energystar.gov/productfinder/product/certified-room-air-cleaners/results>

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

### CONSIDERING COSTS

The activities outlined below have varying fiscal impacts and, depending on your district, you may face difficult decisions. The following is intended to provide options based on your particular district's situation for existing facilities.

BASIC COST	LOW-MEDIUM COST	HIGHER COST
Visually inspect outdoor air dampers to ensure they are opening and that control sequences are operating ventilation systems two hours before and during all occupied hours. For DCV systems, drop CO <sub>2</sub> setpoint to 800 ppm.	Measure outdoor air rates per Section B of the California Energy Commission's Outdoor Air Acceptance Test Procedures (NRCA-MCH-O2-A). Use a certified acceptance test technician.	Replace/add mechanical ventilation systems for classrooms with inadequate mechanical ventilation. Specify economizers.
Ensure all system air filters are fitted with minimum MERV 8 rated filters and replaced at the frequency needed to maintain system airflow.	Install MERV 13 filters in HVAC systems where possible.	Add indoor carbon dioxide monitoring to all classrooms to detect potential ventilation system failures.
Inspect cooling coils and drain pans for cleanliness and drainage of condensate.		Add portable filtration units, particularly when central HVAC systems cannot accommodate MERV 13 filters.

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

### IAQ CHECKLISTS

The following are sample checklist templates for HVAC controls, air conditioning units, and exhaust fans. They should be used to prepare for re-opening, testing and verification of ventilation rates, maintenance of HVAC mechanical systems, and outdoor air acceptance. The CMN recommends that these checklists be integrated into your *Williams* Inspections (see resources for the CASH Facility Inspection Tool (FIT) Guidebook/Section II-HVAC Mechanical Systems-“Beyond the FIT”).

### HVAC CONTROLS CHECKLIST

Yes	No	
		Does the overall appearance of the thermostat appear to be in good condition (does not show excessive wear, t-stat is not obstructed, etc.)?
		When placed into heating, does the unit respond?
		When placed into cooling, does the unit respond?
		When CO <sub>2</sub> levels are above DCV setpoint, does the unit respond with enabling economizer?
		Does the (standalone) thermostat enable the unit at the scheduled time?
		Does the (standalone) thermostat disable the unit at the scheduled time?
		Does the Building Management System (BMS) front-end properly functioning and configured (icons respond with proper functions, are you able to navigate through the campus to various units without lag, unit enable/disable is clearly distinguishable, are the units all properly tagged on the screen, etc.)?
		Does the BMS main panel appear to be in good condition (wires are neatly organized, board is clean, panel is free from debris, panel is free from excessive rust, no signs of water intrusion, etc.)?
		Does the BMS sub or local panel appear to be in good condition (wires are neatly organized, board is clean, panel is free from debris, panel is free from excessive rust, no signs of water intrusion, etc.)?
		NOTES:

# HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

## AIR CONDITIONING UNIT CHECKLIST

Yes	No	
		Does the main fan operate properly (free from abnormal noises, visually appears in good condition, etc.)?
		Do the condensing coils appear to be in good condition (free from debris, absence of leaks, fins straight, etc.)?
		Does the compressor appear to be in good operation (free from abnormal noises, visually appears in good condition, etc.)?
		Does the condenser fan operate properly (free from abnormal noises, visually appears in good condition, etc.)?
		Do the unit controls appear to be in good operating condition (no leaks in the cabinet, wiring is neat, free from debris, etc.)?
		Does the economizer appear to be in good operating condition (no leaks in the cabinet, wiring is neat, free from debris, dampers operate smoothly, damper is not obstructed, etc.)?
		Does the electrical disconnect appear to be in good condition (panel is does not show excessive wear, operates smoothly, etc.)?
		Does the filter show normal signs of usage and up to date with replacement?
		Does the overall exterior of the unit appear to be in good condition (does not show excessive wear, seals are operating properly, no sign of water intrusion, roof flashing appears to be in good condition, etc.)?
		NOTES:

**HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY,  
SCHEDULING AND SOCIAL DISTANCING**

**EXHAUST FANS CHECKLIST**

Yes	No	
		Does the main fan operate properly (free from abnormal noises, visually appears in good condition, etc.)?
		Do the unit speed controls appear to be in good operating condition (no leaks in the cabinet, wiring is neat, free from debris, etc.)?
		Do the unit belts/pulleys appear to be in good operating condition (no cracks, belt should be taut, belt should not be slipping, pulleys are properly lubricated, etc.)?
		Does the electrical disconnect appear to be in good condition (panel does not show excessive wear, operates smoothly, etc.)?
		Does the overall exterior of the unit appear to be in good condition (does not show excessive wear, seals are operating properly, no sign of water intrusion, roof flashing appears to be in good condition, etc.)?
		NOTES:

# HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

## STATE OF CALIFORNIA OUTDOOR AIR ACCEPTANCE FORM

STATE OF CALIFORNIA

### OUTDOOR AIR ACCEPTANCE

CEC-NRCA-MCH-02-A (Revised 01/20)

CALIFORNIA ENERGY COMMISSION



<b>CERTIFICATE OF ACCEPTANCE</b>		<b>NRCA-MCH-02-A</b>
<b>Outdoor Air Acceptance</b>		<b>(Page 2 of 3)</b>
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:
System Name or Identification/Tag:	System Location or Area Served:	

<b>B. Functional Testing</b>				
Building:		Floor:	Room/Area/Zone:	Control/System:
<b>Steps:</b>			<b>CAV</b>	<b>VAV</b>
1	Disable demand control ventilation (if applicable)	<input type="checkbox"/> Check if NA	<input type="checkbox"/>	<input type="checkbox"/>
2	Verify unit is not in economizer mode during test (economizer disabled) (VAV - NA 7.5.1.1.2 Step 1, CAV – NA 7.5.1.2.2 Step 1)	<input type="checkbox"/> Check if NA	<input type="checkbox"/>	<input type="checkbox"/>
3	CAV and VAV testing at full supply airflow			
a.	Adjust supply air to achieve design airflow or maximum airflow at full cooling. (NA 7.5.1.1.2 Step 2)			<input type="checkbox"/>
b.	Measured outdoor airflow reading (cfm) (VAV - NA 7.5.1.1.2 Step 2a, CAV – NA 7.5.1.2.2 Step 2a)		cfm	cfm
c.	Required outdoor airflow (cfm) (refer to NRCC-MCH-E, Section J).		cfm	cfm
d.	Time for outside air damper to stabilize after full supply airflow is achieved (minutes): (NA 7.5.1.1.2 Step 2b)			min
4	VAV testing at reduced supply airflow			
a.	Adjust supply airflow to either the sum of the minimum zone airflows, full heating, or 30% of the total design airflow. (NA 7.5.1.1.2 Step 3)			<input type="checkbox"/>
b.	Measured outdoor airflow reading (cfm). (NA 7.5.1.1.2 Step 3a)			cfm
c.	Required outdoor airflow (cfm) (refer to NRCC-MCH-E, Section J).			cfm
d.	Time for outside air damper to stabilize after reduced supply airflow is achieved (minutes): (NA 7.5.1.1.2 Step 3b)			min
5	Return to initial conditions (NA 7.5.1.1.2 Step 4)		<input type="checkbox"/>	<input type="checkbox"/>
6	Calculations			
Determine Percent Outside Air at full supply airflow (%OA <sub>FA</sub> ) for Step 3. (§120.1(f)1)				
a.	%OA <sub>FA</sub> = Measured outdoor airflow reading / Required outdoor airflow. 100 x (Step3b/Step3c)		%	%
b.	%OA <sub>FA</sub> is within 10% of design Outside Air. (90% ≤ %OA <sub>FA</sub> ≤ 110%)		P / F	P / F
c.	Outside air damper position stabilizes within 5 minutes. (Step 3d < 5 minutes)			P / F
VAV only: Determine Percent Outside Air at reduced supply airflow (%OA <sub>RA</sub> ) for Step 4. (§120.1(f)2)				
a.	%OA <sub>RA</sub> = Measured outdoor airflow reading / Required outdoor airflow reading. 100 x (Step4b/Step4c)			%
b.	%OA <sub>RA</sub> is within 10% of design Outside Air. (90% ≤ %OA <sub>RA</sub> ≤ 110%)			P / F
c.	Outside air damper position stabilizes within 5 minutes. (Step 4d < 5 minutes)			P / F
Functional Testing Compliance Results: <input type="checkbox"/> Complies <input type="checkbox"/> Does NOT Comply				

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

### III. RESOURCES

University of California, Davis Study:

[https://wcec.ucdavis.edu/wp-content/uploads/White-Paper-on-Proposed-School-Ventilation-and-Efficiency-Verification-and-Repair-Program\\_06\\_04\\_2020.pdf](https://wcec.ucdavis.edu/wp-content/uploads/White-Paper-on-Proposed-School-Ventilation-and-Efficiency-Verification-and-Repair-Program_06_04_2020.pdf)

University of California, Davis presentation:

<https://ucdavis.app.box.com/s/xouzsdn6jgqx71ulbzou1g8lhqggdi3i>

California Energy Commission. "2019 Building Energy Efficiency Standards."

[www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency](http://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency)

California Energy Commission. Acceptance Test Technician Certification Providers:

<https://www.energy.ca.gov/programs-and-topics/programs/acceptance-test-technician-certification-provider-program/acceptance>

ASHRAE Epidemic Task Force: Building Readiness (updated May 22, 2020)

<https://www.ashrae.org/file%20library/technical%20resources/covid-19/ashrae-building-readiness.pdf>

ASHRAE Guidance for Building Operations During the COVID-19 Pandemic

[https://www.ashrae.org/file%20library/technical%20resources/ashrae%20journal/2020journaldocuments/72-74\\_ieq\\_schoen.pdf](https://www.ashrae.org/file%20library/technical%20resources/ashrae%20journal/2020journaldocuments/72-74_ieq_schoen.pdf)

ASHRAE Resources:

<https://www.ashrae.org/technical-resources/resources>

ASHRAE Infectious Aerosols:

[https://www.ashrae.org/file%20library/about/position%20documents/pd\\_infectiousaerosols\\_2020.pdf](https://www.ashrae.org/file%20library/about/position%20documents/pd_infectiousaerosols_2020.pdf)

Outdoor Air Acceptance NRCA-MCH-02-A:

[https://energycodeace.com/download/36500/file\\_path/fieldList/2019-NRCA-MCH-02-A%20Outdoor%20Air.pdf](https://energycodeace.com/download/36500/file_path/fieldList/2019-NRCA-MCH-02-A%20Outdoor%20Air.pdf)

Constant Volume, Single Zone, Unitary Air Conditioner and Heat Pump Systems NRCA-MCH-03-A:

[https://energycodeace.com/download/36501/file\\_path/fieldList/2019-NRCA-MCH-03-A-ConstantVolumeSingleZoneHvac.pdf](https://energycodeace.com/download/36501/file_path/fieldList/2019-NRCA-MCH-03-A-ConstantVolumeSingleZoneHvac.pdf)

Air Economizer Controls Acceptance NRCA-MCH-05-A

[https://energycodeace.com/download/36500/file\\_path/fieldList/2019-NRCA-MCH-02-A%20Outdoor%20Air.pdf](https://energycodeace.com/download/36500/file_path/fieldList/2019-NRCA-MCH-02-A%20Outdoor%20Air.pdf)

Demand Control Ventilation Systems Acceptance NRCA-MCH-06-A

[https://energycodeace.com/download/36505/file\\_path/fieldList/2019-NRCA-MCH-06-A-DemandControlVentilation.pdf](https://energycodeace.com/download/36505/file_path/fieldList/2019-NRCA-MCH-06-A-DemandControlVentilation.pdf)

CASH Facility Inspection Tool (FIT) Guidebook/Section II-HVAC Mechanical Systems-"Beyond the FIT").

<http://www.cashnet.org/wp-content/uploads/2020/05/CASH-FIT-Guidebook-Oct-2017-final.pdf>

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

Environmental Protection Agency: Creating Healthy Indoor Air Quality in Schools:

<https://www.epa.gov/iaq-schools>

EPA IAQ Problem Solving Tool:

<https://www.epa.gov/iaq-schools/indoor-air-quality-problem-solving-tool>

EPA Preventive Maintenance Guidance:

<https://www.epa.gov/iaq-schools/indoor-air-quality-tools-schools-preventive-maintenance-guidance-documents>

EPA Framework for Effective School IAQ Management:

<https://www.epa.gov/iaq-schools/framework-effective-school-indoor-air-quality-management-key-drivers>

Risk Higher in Tight Indoor Spaces:

<https://www.businessinsider.com/coronavirus-risk-higher-tight-indoor-spaces-with-little-air-flow-2020-5>

Theodore, 2003:

<https://www.atsjournals.org/doi/full/10.1164/rccm.200306-760OC>

Jerusalem Post, China 2020:

<https://www.jpost.com/international/chinese-researchers-find-airborne-coronavirus-in-wuhan-hospitals-626361>

Jianyun, 2020:

[https://wwwnc.cdc.gov/eid/article/26/7/20-0764\\_article](https://wwwnc.cdc.gov/eid/article/26/7/20-0764_article)

Fanning Howley, 2020:

<https://fhai.com/insights/maintaining-school-hvac-systems-to-address-covid-19/>

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

### SECTION IV: CALCULATING SOCIAL DISTANCING AND SCHEDULING FOR STAFF AND STUDENTS

Social distancing and scheduling are key concepts and challenges to re-opening and operating schools in the COVID-19 environment and require careful consideration. The more people a student or staff member interact with, and the longer that interaction, the higher the risk of COVID-19 spread. The risk of COVID-19 spread increases in school settings as follows:

- **Lowest Risk:** Students and teachers engage in virtual-only classes, activities, and events
- **More Risk:** Small, in-person classes, activities, and events. Groups of students stay together and with the same teacher throughout/across school days and groups do not mix. Students remain at least six (6) feet apart and do not share objects (e.g., hybrid virtual and in-person class structures, or staggered/rotated scheduling to accommodate smaller class sizes)
- **Highest Risk:** Full sized, in-person classes, activities, and events. Students are not spaced apart, share classroom materials or supplies, and mix between classes and activities



The following Best Management Practices (BMP) are intended to assist in implementing social distancing and scheduling for students and staff.

#### II BEST MANAGEMENT PRACTICES

All schools should be evaluated individually to identify maximum capacity, challenges and opportunities.

Following are suggested steps to take:

1. Inspect:
  - a. Walk the school with the principal.
  - b. Evaluate student drop-off and pick-up.
  - c. Consider students ingress and exit from the campus perimeter.
  - d. Visit typical classroom and identify maximum occupancy per room based on social/physical distancing guideline.
  - e. Visit specialty rooms like art and weight room or career technical education and identify opportunities for use and transformation.
  - f. Visit and determine future use of multi-purpose room, gym, theater, locker room, etc., as either classroom or storage.
  - g. Visit cafeteria and determine how school meals will be provided.
  - h. As you walk, envision how to minimize encounters among staff and students thru one-way hallways and stairs.
  - i. Visit restrooms and assign schedules for use.
  - j. Determine how to secure playground structures.
  - k. Identify if athletic facilities will be used (bleachers might be used as marked exercise stations and jogging with social distancing).
  - l. Plan how grounds and blacktops will be used (physical education, emergency evacuations and drills only).

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

2. Evaluate:
  - a. Identify the number of staff and students that can occupy each campus.
  - b. Determine district philosophy and approach about de-densifying classrooms.
  - c. Identify spaces that will not be used for people and assign them to storage of extra materials from classrooms.
  - d. Identify possible outdoor classrooms (for example, on the north side of a building, a class may be held outside in the morning before the day is too hot).
3. Implement:
  - a. Move furniture, fixtures, equipment and classroom materials into storage.
  - b. Purchase additional furniture or equipment.
  - c. Install signage to support your efforts.
  - d. Update your community on social distancing, de-densifying classrooms, and all district efforts.
4. Plan for the Future:
  - a. Plant more deciduous trees appropriate to your region and use them as outdoor classrooms.
  - b. Consider installation of pre-approved shade structures for outdoor classrooms, student lunch, etc.

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### WORKING WITH PUBLIC HEALTH AGENCIES

Relationships are the building blocks of any community partnership. During this pandemic, your relationships will be a key asset in responding to the various challenges you will be tasked with. One of the key relationships you will have to tap into is your relationship with public health agencies. The dynamics will look different in regard to every school district and county office of education. Key points are to: 1) identify your communication bridge to public health; 2) identify clear and defined needs; 3) proactively plan as feasible as possible; and 4) try to determine the safest way to reopen your schools.

If you have not worked with public health agencies, start inside your organization to see if anyone has developed a relationship with your local public health agencies. If no one has an active relationship, reach out to your Superintendent to seek guidance on how to proceed in bridging this gap. You may be directed to your County Office of Education (COE). Whatever path is followed, a crucial step is to develop a single point of contact between the district or COE and public health. This will help facilitate clear and concise communications. Once your contacts have been designated, establish the lines of communications and frequency (will it be via ZOOM, or other virtual platform, weekly, monthly meetings, etc.).

When working with public health agencies, or any organization that may be assisting your district, it is important to have clearly defined goals and roles, so each party can develop a better understanding of each other's situation. When it comes to public health agencies, they may not be experts in school dynamics, as you may not be the expert in public health. It is important to lay out the dynamics of how your schools operate to bridge the knowledge gap to facilitate effective solutions. When communicating, make it clear and visible to public health agencies. Think of what populations you are serving (high school, middle school, elementary, special needs, etc.), the different populations could have different responses or cleaning tactics based on their age range or developmental needs.

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

Public health agencies will be able to help guide you in proactively trying to protect public health, as well as assist if you should have a breakout. When developing protocols and procedures for responding to this pandemic, you will have to think in the immediate, near, and long-term time periods. What can be preventatively and proactively implemented? What is the response in regard to a breakout? How can we open school safely in terms of local health needs? These are all questions to work through with public health agencies. One of the key points is to determine a breakout response and run through a scenario of a breakout. This will help better prepare everyone in the event of a breakout or an identified positive case scenario.

One of the hardest questions to answer right now is how we are going to collectively return to school in light of this pandemic? There is a myriad of issues to consider such as social distancing, PPE needs, Indoor Air Quality, scheduling classes, supply shortages, and a potential looming budget crisis to name a few. A suggestion to overcome this would be to develop a “return to school” task force. This could essentially be a group of stakeholders with a goal of figuring out how to best return our students to school safely. It could collectively involve any stakeholders deemed essential such as public health agencies, school district representatives, community organizations, office of emergency services, community colleges to name a few. This approach could assist in unifying breakout responses and brainstorm solutions.

The need to keep our schools clean, safe, and functional during a pandemic is a huge burden to carry on any one person’s shoulders. It is paramount to utilize your resources to the best of your abilities and to leverage those relationships when needed to provide the best for staff, students, and the community.

Factors to consider:

1. Identify your single point of contact to public health. If you don’t have one, take the correct steps to develop that relationship.
2. Identify or create your line of communications to public health.
3. Clearly communicate your needs and identify your situation.
4. Determine with public health guidance, the immediate, near term, and long-term challenges, solutions, and responses.
5. Develop, facilitate, or contribute toward the conversation.



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## IMPORTANT CONSIDERATIONS

### FURNITURE/EQUIPMENT

1. Create a plan to temporarily remove furniture and equipment out of the classroom that will not be used during the immediate school year.
  - a. Work with union representatives and openly have a conversation on why this is important.
  - b. Items that can be removed could include bulky teacher/paraeducator's desks, student desks, specialized equipment that students will not be using, toys, and personal items.
  - c. Create a classroom guideline on what items can be in the classroom.
  - d. What items can be permanently removed?
  - e. Work with legal to auction items no longer needed.
2. Now is the time to reevaluate the classroom for items that:
  - a. Obscure building signage, electrical outlets, electrical panels or fire extinguishers.
3. Plan for storage
  - a. Is it in the budget to rent a local storage unit (C-train)?
  - b. Evaluate site for what areas on campus can't be used due to social distancing. Can this area be used for storing items (locker rooms, stages, multipurpose rooms)?

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### PERSONAL PROTECTIVE EQUIPMENT (PPE) PROCUREMENT

Given the current logistical and supply chain issues, it can be challenging to procure the necessary PPE for your school operations. If you are having issues procuring PPE, tap into your resources at your local COE. They will be able to either help procure items or provide options to investigate. This may be working with your COE directly or they may direct you to your local city jurisdiction, your local office of emergency services, or the California Office of Emergency Services.

Be sure to contact your COE to determine the best means or methods of procuring PPE you are having challenges with; and communicate your organization's readiness (identify actions you've already taken, and add a checklist for things your staff should be doing right now).

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### ITEMS TO PREPARE FOR RE-OPENING

1. Create a back-up staffing plan/cross training based on different re-opening scenarios.
2. Procurement of PPE, cleaning and disinfecting supplies.
3. Staff training on safety protocols and proper use of disinfection products.
4. Communication plan if someone becomes sick.
5. Clean and disinfect frequently touched surfaces (e.g., playground equipment, door handles, sink handles, drinking fountains) within the school and on school buses at least daily or between use as much as possible. Use of shared objects (e.g., gym or physical education equipment, art supplies, toys, games) should be limited when possible, or cleaned between use.
6. If transport vehicles (e.g., buses) are used by the school, drivers should practice all safety actions and protocols as indicated for other staff (e.g., hand hygiene, cloth face coverings). To clean and disinfect school buses or other transport vehicles - see guidance for bus transit operators.

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

7. Develop a schedule for increased, routine cleaning and disinfection. Ensure safe and correct use and storage of cleaning and disinfection products, including storing products securely away from children. Use products that meet EPA disinfection criteria.
8. Cleaning products should not be used near children, and staff should ensure that there is adequate ventilation when using these products to prevent children or themselves from inhaling toxic fumes.
9. Ensure ventilation as much as possible, for example by opening windows and doors. Do not open windows and doors if doing so poses a safety or health risk (e.g., risk of falling, triggering asthma symptoms) to children using the facility.
10. To minimize the risk of Legionnaire's disease and other diseases associated with water, take steps to ensure that all water systems and features (e.g., sink faucets, drinking fountains, decorative fountains) are safe to use after a prolonged facility shutdown. Drinking fountains should be cleaned and sanitized, but encourage staff and students to bring their own water to minimize use and touching of water fountains.
11. Routine summer cleaning.
12. Update Emergency Operations Plans.
13. Posting signs in highly visible locations (use of masks, social distancing).
14. Modified layouts flexibility.
15. Physical barriers and guides (tape for social distancing on area for lunch lines, physical barriers in bathrooms between sinks, urinals).
16. Food services extra support for custodial and maintenance staff.
17. Social distancing plan in hallways and common areas.
18. Controlling access by outside visitors, contractors, deliveries.

Evaluate stakeholder readiness to return to school, to include staff, students, parents, bargaining units, community partners, etc. (survey).

1. Consider developing surveys for different stakeholders. Each survey that is created should be unique to the audience it is being sent to.
  - a. Staff
  - b. Parents and students
  - c. Community partners
2. Consider creating a newsletter or email letting stakeholders know what has been happening in the schools while students have been distance learning and while staff have been teleworking.
  - a. Highlight the work maintenance and custodial teams have been conducting.
  - b. Show off the new standards of cleaning and disinfecting.
  - c. Empower the staff to assist the custodial crew in disinfecting areas such as teachers' and paraprofessionals' desks every day.
3. Provide a checklist for teachers and parents that will assist in protecting and promoting healthy habits.

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

### CLASSROOMS

Following are things to consider when implementing socially distanced classrooms.

WALLS

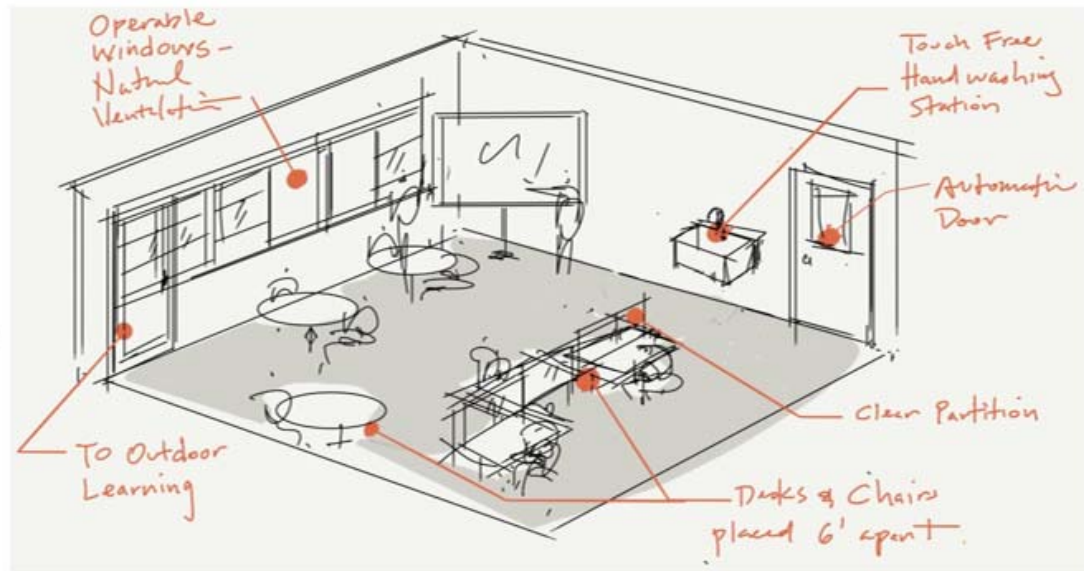
DOORS

WINDOWS

FLOORS

TECHNOLOGY

FURNITURE



1. Social distancing at six (6) feet apart can be used as a tool to work together.
2. Use visual marks on floor as a first step and designation through carpet color or pattern changes as a second step.
3. Classroom instruction will likely be in-person and online (split classes), thus an increase in opportunities to support both methods of instruction.
4. Prepare a space or part of the room for online recording and communication.
5. Install touch-free devices including door hardware, handwashing stations, and faucet and soap dispensers.
6. Increase natural ventilation whenever possible.
7. Select furniture that is easy to clean and less porous than fabric (explore solid plastic).
8. Consider sneeze guards or plexiglass panels at high traffic areas like the main office, reception or attendance desk.

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

### BEHAVIOR-DRIVEN SOCIAL DISTANCING

Following are things to consider when implementing social distancing throughout the school site.

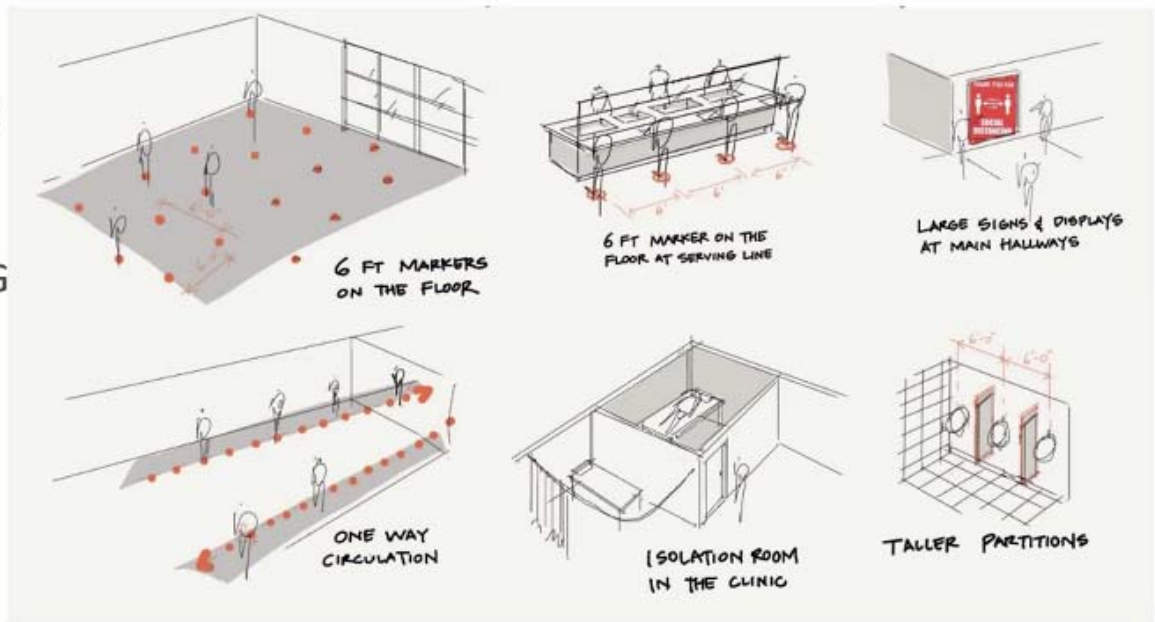
DISTANCE

AWARENESS

SCREENING

SCHEDULING

ISOLATION



1. Partner with other behavior-driven programs to create a reward system for social responsibility in wearing masks and maintaining six (6) foot distance from each other.
2. Circulate in opposite sides of the hallway or create one-way hallways and stairs.
3. Consider six (6) foot markers on the floor for nutrition lines or serving cafeteria.
4. Screening and testing in schools can become a structured method of the future, thus install an isolation room near the nurse's office.
5. Install handwashing stations in middle of campus ideally outdoor that are easily accessible with high visibility.
6. Install signage to communicate all efforts and remind staff and students.
7. Consider taller urinal partitions in restrooms.

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

### TECHNOLOGY

Use technology when possible to minimize transmission.

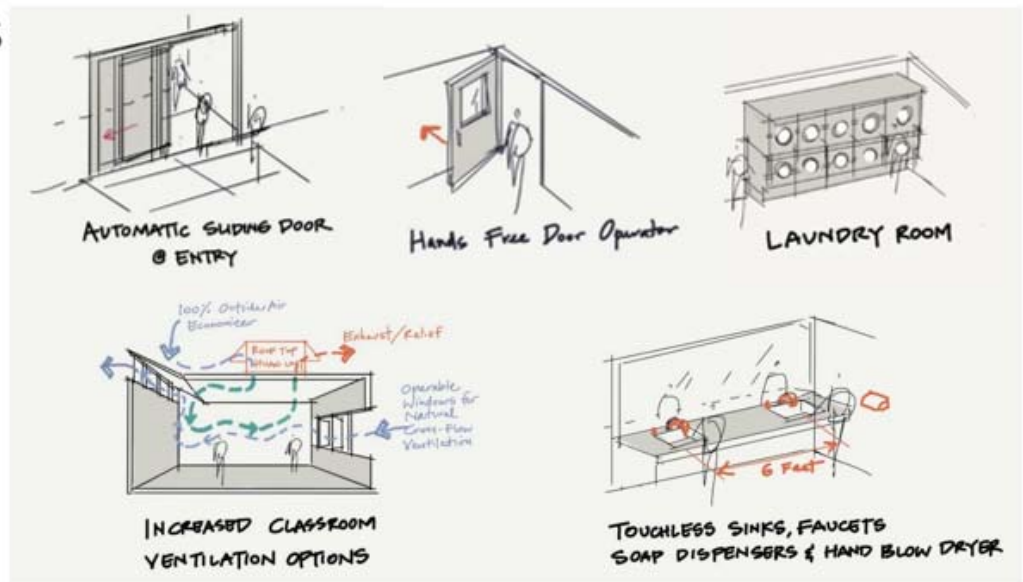
#### HANDS-FREE DOORS

#### FIXTURES

#### WASHING

#### HVAC

#### FILTRATION



1. Use automatic sliding doors at entry and equip them with automatic locking mechanism for emergencies.
2. Use building systems in the way they were designed.

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

### III RESOURCES:

CDC COVID-19 Guidance:

<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Guidance.aspx>

LA County Guidance for Social Distancing:

<http://publichealth.lacounty.gov/media/Coronavirus/GuidanceSocialDistancing.pdf>

CDC Guidance on Schools/Day Camps:

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

CDC Clean Disinfect:

<https://www.cdc.gov/coronavirus/2019-ncov/community/clean-disinfect/index.html>

CDC Clean/Disinfect Facility:

<https://www.cdc.gov/coronavirus/2019-ncov/community/disinfecting-building-facility.html>

EPA Products:

<https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2-covid-19>

Bus and Transit:

<https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/bus-transit-operator.html>

Legionnaire's Disease:

<https://www.cdc.gov/legionella/about/index.html>

CDC Building Water System:

<https://www.cdc.gov/coronavirus/2019-ncov/php/building-water-system.html>

AIA Reopening Assessment Tool:

<https://www.aia.org/resources/6292441-re-occupancy-assessment-tool>

Workplace readiness essentials:

<https://cushwk.co/3at0Ldg>

LACOE's Planning Framework for the 2020-21 School Year:

<https://www.lacoe.edu/Home/School-Reopening>

Cal OSHA Guidance on Preparing Workplaces for COVID-19:

<https://www.osha.gov/Publications/OSHA3990.pdf>

Teachers and Parent Checklist:

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

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

### SECTION V: MANAGING FISCAL IMPACT: PLANNING, RISK MANAGEMENT AND COMMUNICATIONS

This section outlines key resources and ways to think about funding COVID-19 impacts, as well as recommendations related to managing risk and advocating for your needs. COVID-19 has challenged school maintenance and facility leaders to speak up about what will be needed to do the job they are being asked to do. Be ready with the costs and important related data about why it is important. Buildings can't speak - be their voice and make the case.



#### MAKE M&O'S VOICE HEARD IN THE DISTRICT'S LCAP PROCESS

Local Control Accountability Plan (LCAP) is a team sport, and those at the LCAP table - with the right case being made that a specific initiative or expenditure will help students stay in school (attendance), and learn (outcomes of attendance) - win the funding.

1. Make the case that the maintenance of the place where students go to learn affect both attendance and learning, and that maintained buildings are the backbone to functioning and highly successful student outcomes, as well as maximizing district funding.
2. Have a robust maintenance plan that conducts a site-by-site analysis, and ends in grouping like items together, such as roofing, by priority-based condition.
3. Have a plan that includes everything, at least five years out.

If there must be a delay with some of the planned maintenance to respond to the current crisis, be sure to communicate the urgency with which the district will need to get back on track. There is a significant impact to delaying needed maintenance and you need to make that case as dollars become scarce. See the resources section for the CASH Facility Inspection Tool (FIT) Guidebook - "Beyond the FIT" for more information.

#### FUNDING COVID-19 EXPENDITURES

During the current pandemic, planning and focus on getting ready to return to school, be sure to document the additional expenses due to this moment so that they can be claimed from additional funds from Congress or from Federal Emergency Management Agency (FEMA). Extra documentation will be required for the FEMA funds.

The CARES Act funds are coming through the California Department of Education (CDE). Each Chief Business Official (CBO) will provide very specific coding if M&O is authorized to expense those funds. CARES Act covers allowable expenses to a district maximum, coordination with the other departments ensures that the funding will cover what needs to be purchased. This is the funding that is also covering the costs of at-home teaching and learning, the devices and software get funded from here. Personal Protective Equipment (PPE) can also be funded from this source. See the resources section for assistance in using these funds.

FEMA will also be funding claims, they reimburse at 75 percent of cost for expenses directly due to this pandemic.

### THE FEMA PROCESS – in brief



The FEMA funding is being administered by the Governor’s Office of Emergency Services (Cal OES). They have a very detailed process which is provided in brief format in the graphic above. One significant piece of information is that as soon as the Request for Public Assistance (RPA) is approved, a manager will be assigned. Amendments to your application estimates can be made throughout the process and even at final submittal. It is important to request assistance during the disaster or the window of opportunity may close.

Some tips on coding and passing the audits for these programs would be:

1. Designate a unique project identifier in the coding, this is required for federal funding and is like what we do for state facilities funding. Number project(s) in the goal code, management code, or where the CBO says to put it. It just has to be in the string and used whenever funds are being spent.
2. The FEMA grant has a very granular audit. They will want more than just a purchase order and a payment to justify receiving the funds. FEMA will want to know who used the equipment and when. Would the district have purchased it anyway? FEMA will want daily logs showing which staff worked the event and what they were doing, etc.
3. Because the audits are rigorous, break your district down into several projects. For instance, each school site could be a project and then one for the district office. If one audit hits a snag, the money could still come through from the others and it would not all be held up.
4. Make sure documents are kept and filed. If electronically filed, make sure it is not in a system that purges in two years. Auditing may not be complete by then.
5. CARES Act and FEMA do not cover the same things, although there is some duplication. Strategize which funding source is covering which expenses, then code and store documents accordingly. (See OES Q&A for explanation of the differences).

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

### MANAGING RISK AND ADVOCACY

All agencies and businesses assume a certain level of risk and find ways to manage such risk. Strategies vary, but all have the common goal of minimizing exposure while maximizing the benefits for the community it serves.

One proven strategy is to comply with federal, state, and local laws including Americans with Disability Act (ADA), Occupational Safety and Health Administration (OSHA), Department of Pesticide Regulation (DPR), and more recently with Department of Public Health (DPH) regulations and requirements.



Another strategy is to implement:

- Social/physical distancing between occupants,
- Practice healthy hygiene,
- Consistent use of face coverings for staff and students,
- Post reminders in the form of signs and alerts, and
- Minimize transmission of pathogens including COVID-19.

Workplace controls can serve as a strategy, especially when balanced with building system management, staff education, and policy/procedure updates. Remain vigilant on the evolution of guidance for schools and day care centers in the state and your local jurisdiction and stay connected with colleagues for consistency in your area.

Risk assessment looks different today. Staff and students spend more time communicating online, thus increasing security risk around privacy and data security, placing cybersecurity vulnerabilities as the new risk. Closed schools save money as utility bills are lower, but cost money as we plan to reopen schools with multiple instruction methods, new additional cleaning requirements, and many variables education agencies had not faced in the past.

Academic instruction, tests, and grades have evolved, even graduations are now virtual, paving the way to questions about academic integrity and enrollment verification. Student life has temporarily moved away from campus settings and it's time to build trust and encourage a return to campus. Student life has evolved and so have the priorities of maintenance and operations professionals. It is important to find new ways to connect with our leaders, to advocate for staff and funding for increased cleaning and disinfecting, de-densifying classrooms, moving of furniture, fixtures and materials, evaluating building systems like HVAC and even upgrading features to prevent transmission.

We must continue to manage the physical environment and building systems that support student success while supporting everyone's health and safety.

## HEALTHY SCHOOLS: CLEANING, DISINFECTING, HEALTHY AIR QUALITY, SCHEDULING AND SOCIAL DISTANCING

### RESOURCES

New to the LCAP Process?

[https://www.cde.ca.gov/re/lc/#:~:text=Local%20Control%20and%20Accountability%20Plan%20\(LCAP\),and%20evaluation%20of%20an%20LCAP.](https://www.cde.ca.gov/re/lc/#:~:text=Local%20Control%20and%20Accountability%20Plan%20(LCAP),and%20evaluation%20of%20an%20LCAP.)

<https://www.cde.ca.gov/ls/fa/re/>

CASH Facility Inspection Tool (FIT) Guidebook:

<http://www.cashnet.org/wp-content/uploads/2020/05/CASH-FIT-Guidebook-Oct-2017-final.pdf>

LCAP FAQ:

See <https://www.cde.ca.gov/re/lc/lcapfaq.asp>

CARES Act:

<https://www.cde.ca.gov/fq/aa/ca/caresact.asp>

Elementary and Secondary School Emergency Relief Fund:

<https://oese.ed.gov/files/2020/05/ESSER-Fund-Frequently-Asked-Questions.pdf>

International Facility Management Association:

<https://www.ifma.org/>

### ADDITIONAL RESOURCES

California Department of Public Health Guidance for Schools:

<https://covid19.ca.gov/pdf/guidance-schools.pdf>

CDE Guidelines:

<https://www.cde.ca.gov/ls/he/hn/coronavirus.asp>

San Diego County Office of Education COVID-19 Planning Assumptions:

[https://covid-19.sdcoe.net/Portals/covid-19/Documents/Pandemic%20Plan%20Resources/20-04-14\\_Recovery\\_Plan\\_Assumptions\\_and\\_Recommendations.pdf](https://covid-19.sdcoe.net/Portals/covid-19/Documents/Pandemic%20Plan%20Resources/20-04-14_Recovery_Plan_Assumptions_and_Recommendations.pdf)

CDC School Re-Opening Guidelines:

<https://www.cdc.gov/coronavirus/2019-ncov/downloads/php/CDC-Activities-Initiatives-for-COVID-19-Response.pdf>

Santa Clara School Pandemic Toolkit

[https://files.nwesi.org/website/School\\_Nurse/Resource%20Guide/Section\\_8/Santa\\_Clara\\_School\\_Pandemic\\_Toolkit.pdf](https://files.nwesi.org/website/School_Nurse/Resource%20Guide/Section_8/Santa_Clara_School_Pandemic_Toolkit.pdf)

EdWeek Re-Opening Schools Series:

<https://www.edweek.org/ew/issues/reopening-schools/the-socially-distanced-school-day.html>

