COVID-19 Testing in K-12 Settings: “Day in the life of” (DILO) case study examples

For questions about this resource or to inquire about support in implementation, please contact Chiefs for Change at cfcta@chiefsforchange.org.

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Testing can be considered in the context of broader measures to help mitigate COVID-19

Establish hygiene protocol
- Clean and disinfect surfaces and equipment routinely
- Promote frequent and thorough hand washing and avoid touching one's face
- Improve ventilation to increase delivery of clean air; avoid indoor gatherings where possible

Limit person-to-person contact
- Minimize contacts among students, teachers, and other staff through measures such as staggering schedules, and cohorting
- Install physical barriers, such as clear plastic sneeze guards

Institute masks and PPE usage
- Require mask usage as a simple barrier to reduce respiratory droplets
- Provide additional PPE (personal protective equipment), e.g. facemasks, eye protection, disposable gloves, and gowns, to be worn by individuals such as healthcare professionals

Test to identify/isolate cases
- Monitor for symptoms and develop procedures for individuals to report COVID-19 symptoms or exposure to COVID-19
- Encourage individuals to stay at home without fear of reprisal
- Develop programs to test individuals

Mitigation measures, individual or several combined together, should be considered within other local contextual factors, e.g., government laws and regulations, supply availability, cost considerations, COVID-19 prevalence and trends, population density

Testing can be a part of a broader reopening plan, see additional reopening resources below
- How Should Education Leaders Prepare for Reentry and Beyond
- School Reopening Workbook: Tool for School Districts
- State education agency resource guide
- Day in the life of (DILO) resources

Source: The Rockefeller Foundation's COVID-19 Testing in K-12 Settings: A Playbook for Educators and Leaders, CDC
Districts that have implemented COVID-19 testing programs have reported several benefits

<table>
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<tr>
<th>Benefits</th>
<th>Example</th>
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<tr>
<td>Reduce community spread</td>
<td>• Screening testing enables greater identification of asymptomatic individuals with COVID-19 infections (~25-40% of infections) and can reduce community spread and prevent possible school outbreaks</td>
</tr>
<tr>
<td>Ensure equitable access to testing</td>
<td>• Some families may not be able to seek regular testing if it is not offered on school grounds (especially in under-resourced and rural communities)</td>
</tr>
<tr>
<td>Increase confidence</td>
<td>• Assurance among staff and families of increased safety of in-person learning</td>
</tr>
<tr>
<td>Maximize in-person instruction</td>
<td>• Identifying positive and negative individuals quickly allows schools to avoid quarantines and maximize students’ in-person instructional time</td>
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There are several steps that need to be taken to implement a COVID-19 testing program.

**Purpose of this guide:** Provide a perspective on how school districts can set up COVID-19 testing programs as one of many approaches to open schools safely.

**Source:** The Rockefeller Foundation's COVID-19 Testing in K-12 Settings: A Playbook for Educators and Leaders
To lay the groundwork for a testing program, school systems have addressed several components

**Form a testing taskforce**

- Identify individuals to be part of the “Central Response Team” of the operation – which includes serving as the face of the testing program and managing the planning, implementation, and communications of the program

**Identify community and healthcare partners**

- Engage local public health authority and healthcare providers, state and local governments, and community organizations to inform the testing strategy

**Establish a governance structure**

- Establish taskforce governance mechanisms in first week, e.g.:
  - Roles of each member
  - Meeting cadence
  - Information flows
  - Decision-making mechanism

**Secure financial support**

- Determine how to pay for testing as a district, e.g.:
  - State or federal government
  - County funded (without district involvement)
  - CARES Act funding
  - Existing district budget
  - Philanthropic support

**In action**

- Key taskforce roles are often filled by staff that are redeployed; they include:
  - District Coordinator (e.g., Chief of Staff)
  - School Coordinator (e.g., Principal or Vice Principal)
  - Test Coordinator (e.g., Nurse)

- In Tulsa, Oklahoma, the health department and the district worked together to optimize the limited supply of tests they had by identifying the schools in areas with the highest risk of introducing an infection in school. They also partnered to offer testing to all elementary school teachers

- In Ector County, Texas, the taskforce is divided into smaller divisions with specific roles that meet weekly. The leads of each division then meet every two weeks with the Superintendent

- In Massachusetts, the state is paying for pooled testing resources and distributing them to districts.

**Source:** The Rockefeller Foundation's COVID-19 Testing in K-12 Settings: A Playbook for Educators and Leaders
There are several design dimensions involved in the testing strategy

<table>
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<td>Antigen (rapid test)</td>
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<td>Opt-in</td>
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<td>Screening</td>
<td>Molecular PCR</td>
<td>Pooled test (with individual samples)</td>
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<td>Nasal swab</td>
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<td></td>
<td></td>
<td>Pooled test (with pooled samples)</td>
<td>Families</td>
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<td>Twice a month</td>
<td>Nasopharyngeal</td>
<td>External site</td>
</tr>
</tbody>
</table>

Source: The Rockefeller Foundation’s COVID-19 Testing in K-12 Settings: A Playbook for Educators and Leaders, CDC
Four case study examples illustrate different testing programs

1. Diagnostic testing
   Use tests (either rapid or PCR) to confirm if symptomatic individuals or close contacts of those infected have COVID-19

2. Screening testing using rapid tests
   Screen¹ individuals and identify asymptomatic cases; results received within 15mins which means individuals with COVID-19 can be quickly identified

3. Screening testing using individual PCR tests
   Screen¹ individuals and identify asymptomatic cases; PCR test results are more accurate than rapid tests (especially for asymptomatic cases)² but results are typically received within 24-48h rather than 15min

4. Screening testing using pooled PCR tests
   Same as 3, with lower test costs than individual PCR tests;³ for some types of pool testing processes, may need to collect a second sample to confirm which individual(s) in a pool tested positive⁴

Each case study example includes a Day In the Life Of (DILO) journey for a student (Josh) and/or a teacher (Ms. Gomez)
Additional context and “what if” scenarios are provided

1. Routine testing of all individuals, including those without symptoms or suspicion of exposure, to identify infected people sooner and reduce transmission by isolating potentially infected individuals; may be universal (required) or optional
2. The sensitivity of rapid tests varies, and is lower than molecular PCR tests. One CDC study of one specific rapid test found it had a sensitivity of 80% among symptomatic persons and 41% among asymptomatic persons compared to PCR testing
3. In areas of high COVID-19 prevalence, more pools may be positive, requiring retesting to isolate positive individuals which can increase the time it takes to identify and isolate the positive individual(s)
4. Some pool testing processes require individuals in the pool to be retested (i.e. a new sample needs to be collected) when there is a positive pool. However, some pooled testing process use only a portion of the sample in the pooled processing, so they can use the remainder for re-running individual tests if necessary

Case study 1 – Diagnostic testing

Urban district of >30k students with 2/3 in-person or hybrid1 and 1/3 fully remote, began phasing in-person return as of Aug. 2020

In Dec. 2020, district launched diagnostic testing for symptomatic staff; in Jan. 2021, district expanded program to all students (first middle and high schools and then elementary)

Testing program design

- **Testing objective**
  - Diagnostic
  - Screening

- **Type of test**
  - Antigen (rapid test)
  - Molecular - PCR

- **Individual or pooled sample**
  - Individual
  - Pooled test (with individual samples)
  - Pooled test (with pooled samples)

- **Who is tested**
  - Staff
  - Students
  - Family

- **Opt-in or required**
  - Opt-in
  - Required
  - Random sample

- **Testing frequency**
  - Twice a week
  - Weekly
  - Twice a month
  - None - diagnostic

- **Sample type**
  - Saliva
  - Nasal swab
  - Nasopharyngeal

- **Where sample is collected**
  - At home
  - At school2
  - External site

Key enabling factors

- State purchased antigen tests and PPE and made them available for all districts in November 2020; district began phased implementation of diagnostic testing approach in December
- District supported communications campaign including texts, emails, calls, and virtual meetings; also shared FAQs for staff and families
- Nurses have been engaged throughout to ensure their input is incorporated in the program design

Impacts / benefits felt

- **Detection of positive cases to prevent spread**: Since testing started, ~480 staff and students have been tested and ~60 were positive; there have been 2 identified false negatives
- **Transparency and trust**: Before reopening, the district informed the community there would be positive cases and shared their safety protocols. Then, when 2 teachers tested positive on the first day, the community still trusted in schools to be candid and keep them safe

Lessons learned

- Requiring that a responsible adult sign the consent form in-person helps ensure that symptomatic students are picked up from school, regardless of their test result
- It was easier to get staff and community buy-in to conduct diagnostic testing of symptomatic individuals than to conduct screening testing

“**Our community appreciates the transparency and these testing opportunities. It gives them confidence that their school is keeping the community safe.**”

– Superintendent

1. Elementary and middle schools are all in-person; some high schools are hybrid and some are in-person
2. Most staff are campus-based and have samples collected at school; non-campus based staff (e.g. some administrative staff, bus drivers, etc.) are tested separately at a non-campus administrative building

Source: Interviews with district leaders
1: DILO simulation of Josh, a student, taking a diagnostic test in an in-person learning setting

1. A responsible adult is an authorized individual who is allowed to sign the consent form and escort the student from school grounds

Source: Interviews with district leaders

CASE STUDY EXAMPLE ONLY
NOT A RECOMMENDATION
1: DILO simulation of Josh, a student, taking a diagnostic test in an in-person learning setting and testing positive or negative

Josh – 1st grade in-person GenEd student

After the test

8. Josh's responsible adult drives Josh home from school. Thurs, 12:40-1:10 PM

9. Josh tests positive

9+. Josh's responsible adult gets an automated email or text saying Josh tested positive. Thurs, 2:00 PM

10. Josh sees a doctor who diagnoses Josh's symptoms as a cold, though to be sure gets Josh to take a PCR test that comes back negative Fri, 10 AM

11+. Josh has brief, limited symptoms and attends virtual classes for the 10 calendar days after he tests positive.

12+. Josh's responsible adult drives Josh to school and reminds him to go to the nurse's office. Mon (10 days after Josh's positive test), 7:15-7:45 AM

13+. Josh walks to the nurse's office, where the nurse takes his temperature and asks him questions about his symptoms. Mon, 7:55-8:00 AM

14+. The nurse sends Josh to his homeroom for class. Thurs, 8:00-8:15 AM

Source: Interviews with district leaders
1: Alternate simulation plans for Josh in case of example ‘what if’ scenarios

CASE STUDY EXAMPLE ONLY – NOT A RECOMMENDATION

Josh – 1st grade GenEd student is symptomatic at school and...

What if...

Josh is too sick to participate in virtual learning

Josh tested positive and returns to school early or with symptoms

Josh’s responsible adult opts for Josh to not take the diagnostic test

Key questions

What happens to Josh if he is too sick to participate in virtual learning?

What safety protocols are in place to protect students and staff from a positive individual returning to school?

What happens if Josh’s responsible adult opts out of the COVID diagnostic test?

“Divergent” steps

Josh notifies his teacher that he is too sick to learn remotely and rests at home for 10 days. If he still has symptoms after 10 days, he gets a doctor’s note and stays home. Josh receives paper packets of work he missed that he can work on when he’s feeling better.

If Josh tests positive, the nurse calculates the earliest date Josh can return to school and informs Josh’s responsible adult and Josh’s teacher. When Josh returns to school, he must stop by the nurse’s office for a screening. There, the nurse notices if Josh’s test was less than 10 days ago and sends Josh home. If Josh goes straight to class, his teacher sends him to the nurse’s office for the screening. Josh cannot return for 10 days after testing positive, regardless of whether he later tests negative.

Josh stays in the Care Room and waits until a responsible adult can pick him up. He is supervised during this time by a nurse or staff member in PPE. To return to school, Josh must either get a doctor’s note with an alternative diagnostic, get a negative PCR test, or wait 10 days. When Josh returns to school, he must stop by the nurse’s office for a screening.

Source: Interviews with district leaders
Case study 2 – Screening testing using rapid tests

Urban district with >20k students, high school in hybrid A/B schedule, elementary school fully in-person. 1/3 of all students have opted to be fully remote.

In January 2021, district launched screening testing 2x per month for all interested students and staff.

Testing program design

Key enabling factors

- State purchased antigen tests and made them available for all districts.
- After the program was up and running, the State provided an EMT service of 6 people to supplement the districts’ staff (not all schools use EMT service), with EMT personnel performing the sample collection.
- Communications campaign at district and school level including texts, social media, and calls.
- Diagnostic testing available through pop up sites around the city and state.

Impacts / benefits felt

- More students chose to return to in-person school: Total students opting for hybrid or in-person learning over virtual learning increased by ~10%, reflecting greater comfort with returning to schools.
- Reassurance that positive cases are identified and overall community transmission low: First round of baseline testing determined positivity rate of 0.75% among ~2k tests; ~1% students and staff quarantine each week for 10 days given exposures.

Lessons learned

- Takes time and effort to collect consent forms; utilizing online survey and paper forms eventually secured permission for ~25% of students.
- Elementary school parents often want to be with kids during testing, but space constraints limit that.
- High school students may be less likely to get tested (e.g., hard to reach, fear of not being able to work) so nurses are finding time to explain to them why it’s important.

Parents have emailed thanking us for keeping the kids safe. A lot of our staff are also taking advantage of the testing. It’s given everyone reassurance.

– Head nurse

1. Elementary schools are in-person and middle and high schools are hybrid; 2. Testing program is in addition to existing state K-12 option and pop up 15 minute screening.

Source: Interviews with district leaders.
2: District and school testing plan context

District testing plan

The district has set up twice monthly testing for students and staff at their ~40 schools.

Initially, school nurses ran the testing program at each, but after a few weeks the State provided an EMT service of 6 people, which travels directly to most schools to help conduct testing. Some schools have elected to keep doing testing on their own.

Testing takes ~2.5 hours for each school including, sample collection, processing, and reporting. Teachers often get tested outside class time, such as before start of day, and students get tested during classes. Testing takes ~5 minutes per person.

~15 middle and high schools

Hybrid on "A/B" schedule. Students are in-person on alternating days. Thus, each school schedules testing on 2 days per testing cycle (4 times per month).

~25 elementary schools

Fully in-person, 5 days a week. Each school schedules testing once every two weeks.

Example DILO simulations next

Ms. Gomez’s high school has an assigned testing block of 2.5 hours in the morning every other Wednesday and Thursday, when it tests its staff (for the first 30mins of testing) and students (for the remaining 2 hours). During that 2.5 hour window, any individual with a positive test result is notified. Note the school schedule (e.g., classes) continues in parallel during testing.

Josh’s elementary school has an assigned testing block of 2.5 hours every other Thursday morning, during which students and staff may participate in testing. Note the school schedule continues in parallel during testing.

Source: Interviews with district leaders

1. All 6 EMTs were assigned to different schools in the district in teams of 1-2 individuals; individual EMTs schedule specific days and times every two weeks when they will travel to their assigned schools to test; while the State provided tests to every district, the EMT service was a special grant provided to the district after testing began to lessen the burden on nurses.
2: DILO simulation of Ms. Gomez, a teacher, taking a screening test in an in-person learning setting and testing negative

Ms. Gomez – high school teacher, in-person

1. After already reading about it in the weekly school newsletter on Friday, Ms. Gomez checks her phone and sees an automated text reminder about COVID testing on Wednesday and Thursday morning, which are the assigned times for her school. Wed, 7:45-7:50 AM

2. Ms. Gomez walks to the cafeteria where the testing occurs. Wed, 7:45-7:50 AM

3. When she arrives, Ms. Gomez sanitizes her hands and waits in a single file line. Wed, 7:50-8:00 AM

4. When she reaches the front of the line, the school nurse asks Ms. Gomez for her name and birthday and writes them on the test kit. Wed, 8:00-8:05 AM

5. Following the nurse’s directions, Ms. Gomez swabs each of her nostrils and puts the swab in the test card. She drops the test card off on a table, where the nurse seals it. Wed, 8:05-8:10 AM

6. Ms. Gomez walks back to her classroom, knowing that she will be informed of her result if it is positive. Wed, 8:10-8:15 AM

7. Ms. Gomez begins teaching her first class. Wed, 8:30 AM

8. While Ms. Gomez teaches, a staff member enters the classroom and announces that anyone with consent in that class can leave for testing. Students with consent all leave and return one by one after ~15 minutes. Wed, 8:30-9:30 AM

9. Ms. Gomez teaches the rest of her classes without interruption. Wed, 9:30 AM-2:30 PM

10. Ms. Gomez teaches in-person classes with an alternating group of students each day. In her first class on Wednesday, the other group of students with consent leave during class to get tested. Wed-Fri

11. Ms. Gomez receives the weekly school newsletter informing her of upcoming test dates in 2 weeks. Fri, 2:00 PM

Source: Interviews with district leaders
As they walk, the nurse informs Ms. Gomez that the principal has assigned a substitute teacher to take over her classes today. The substitute arrives 30 mins later; before she arrives, a staff member watches Ms. Gomez’s class.

Wed, 8:30 AM

9

As they walk, the nurse informs Ms. Gomez that the principal has assigned a substitute teacher to take over her classes today. The substitute arrives 30 mins later; before she arrives, a staff member watches Ms. Gomez’s class.

Wed, 8:30 AM

10

Ms. Gomez sits in the care room as the nurse asks her who she has been in close contact with over the past 2 days. Wed, 8:30-8:45 AM

The school nurse notes the names of the three students Ms. Gomez was in close contact with on Monday and picks them up from class and brings them to the care room. The students she was in close contact with on Tuesday (who are at home due to the hybrid A/B schedule) will also need to be contacted.

Wed, 8:45-9:00 AM

Ms. Gomez leaves the school and drives home. Wed, 8:45-9:15 AM

Ms. Gomez follows a nurse to the Care Room. Wed, 8:25-8:30 AM

The school nurse calls the students’ responsible adults if the students sit in the Care Room. The school nurse also calls the responsible adults of the two students Ms. Gomez was in contact with on Tuesday. The school nurse waits with the students until their responsible adults can pick them up. They sit at least 6 ft apart. Later that day, all the students in Ms. Gomez’s classes receive a letter to take home informing their household that someone in class tested positive.

Wed, 9:00-9:45 AM

Ms. Gomez walks back to her classroom. Wed, 8:10-8:15 AM

Before Ms. Gomez begins teaching her class, a nurse enters the room and informs her that she tested positive. Wed, 8:25 AM

Ms. Gomez follows a nurse to the Care Room. Wed, 8:25-8:30 AM

The school nurse notes the names of the three students Ms. Gomez was in close contact with on Monday and picks them up from class and brings them to the care room. The students she was in close contact with on Tuesday (who are at home due to the hybrid A/B schedule) will also need to be contacted.

Wed, 8:45-9:00 AM

Ms. Gomez leaves the school and drives home. Wed, 8:45-9:15 AM

Ms. Gomez – high school teacher, in-person

Ms. Gomez teaches classes in-person after completing the 10 day quarantine. Mon-Fri

Ms. Gomez quarantines at home for 10 calendar days. Since she has limited symptoms, she chooses to teach virtual classes for some or all those days. At school her students learn with her virtually on their laptops and are supervised by a substitute teacher. Thurs-Fri and Mon-Fri

1. A responsible adult is an authorized individual caring for the child and may include a parent, guardian, caretaker, family member, or friend. Source: Interviews with district leaders.
# 2: Alternate simulation steps for Ms. Gomez in case of example ‘what if’ scenarios

**Ms. Gomez – high school teacher, in-person tests positive at school and…**

### What if…

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<th>Scenario</th>
<th>Key questions</th>
<th>“Divergent” steps</th>
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<tr>
<td>Ms. Gomez is too sick to teach virtual classes</td>
<td>What happens to Ms. Gomez if she is too sick to teach virtual classes? Who takes over her classes?</td>
<td>Ms. Gomez notifies the school that she is too sick to teach remotely and rests at home for 10 days. If she still has symptoms after 10 days, she gets a doctor’s note and stays home. While she rests, the principal finds a substitute teacher to take over her class and teach her students in-person. Her days resting are logged as “quarantine days” and do not impact her paid sick time.</td>
</tr>
<tr>
<td>Ms. Gomez tests negative within 10 days of her positive test result</td>
<td>What happens to Ms. Gomez if she tests negative while in quarantine?</td>
<td>Ms. Gomez is required to quarantine for the full 10 days following her positive test – regardless of whether she tests negative afterwards. If she is well, she can teach virtual classes. At school her students learn with her virtually on their laptops and are supervised by a substitute teacher.</td>
</tr>
<tr>
<td>Students and staff in close contact with Ms. Gomez test negative</td>
<td>What happens to students or staff Ms. Gomez was in close contact with if they test negative?</td>
<td>Close contacts are told to quarantine for 10 calendar days, but 5-7 days later they can get tested, and if they are negative, they can return to school on day 8. To return, the negative test must be taken 5-7 days after Ms. Gomez’s positive result.</td>
</tr>
<tr>
<td>Ms. Gomez goes to get tested at school 2 weeks later</td>
<td>What happens if Ms. Gomez goes to get screening tested again within 90 days of her positive test?</td>
<td>Before she gets tested, one of the screening questions the nurse asks Ms. Gomez is if she’s ever tested positive for COVID. When Ms. Gomez says “yes,” the nurse informs her that it is unnecessary for her to get tested for 90 days after her positive result.</td>
</tr>
</tbody>
</table>

Source: Interviews with district leaders

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CASE STUDY EXAMPLE ONLY ~NOT A RECOMMENDATION
2: DILO simulation of Josh, a student, taking a screening test in an in-person learning setting and testing negative

Josh – 1st grade in-person GenEd student

A. Before the test
1. After reading about it in the school newsletter, Josh’s responsible adult gets a text message about testing and fills out the online consent survey for Josh.1
   - Sat, 2:00 PM

2. Josh takes the bus to school and sits by himself in his assigned seat. All the students wear masks and sit 6 ft. apart.
   - Thurs, 7:15-7:45 AM

3. Josh goes to his homeroom and attends in-person classes.
   - Thurs, 8:15-11:25 AM

4. Given that he is in grades K-2, a school staff member picks all the students with consent up from Josh’s class and walks them to the cafeteria, where testing occurs.
   - Thurs, 11:25-11:30 AM

B. During the test
5. When they arrive, they are asked to sanitize their hands and wait in a single file line.
   - Thurs, 11:35-11:40 AM

6. When he reaches the front of the line, the school nurse asks Josh for his name and birthday and writes them on a test kit.
   - Thurs, 11:35-11:40 AM

7. Josh stands still as the nurse swabs each of his nostrils. The nurse puts the swab in the test kit and hands it to the nurse assistant.
   - Thurs, 11:40-11:45 AM

8. Josh waits with the school staff member for students in his class to finish testing. Then, the staff member walks Josh’s classmates back to their homeroom.
   - Thurs, 11:45 AM-12:00 PM

9. After the test
   - Thurs, 12:00 PM-2:15 PM

C. After the test
10. Josh goes to his homeroom and attends in-person classes.
    - Thurs, 8:15-11:25 AM

11. Josh takes the bus home.
    - Thurs, 2:15-2:45 PM

12. Josh’s responsible adult receives the weekly newsletter informing them of upcoming testing and informs Josh.
    - Fri, 2:00 PM

CASE STUDY EXAMPLE ONLY
- NOT A RECOMMENDATION

1. Weekly communications about testing include text messages, social media posts, weekly newsletter messages, and phone calls; parent/guardian consent for testing only needs to be obtained once.

Source: Interviews with district leaders
2: DILO simulation of Josh, a student, taking a screening test in an in-person learning setting and testing positive

**Josh – 1st grade in-person GenEd student**

**Josh sits in the Care Room and the nurse asks him who he has been in close contact with over the past 2 days (within 6ft for 15 minutes or more). After speaking to Josh, the nurse calls his responsible adult to share that Josh tested positive and needs to be picked up. The nurse also asks who Josh has been in close contact with and what symptoms, if any, Josh had recently.**

Tues, 12:15-12:25 PM

**Josh’s responsible adult picks Josh up from school and drives him home.**

Tues, 1:30-2:00 PM

**Josh waits in the Care Room for his responsible adult to pick him up. A nurse or another staff member in PPE watches him.**

Tues, 12:25-1:30 PM

**After 10 days, Josh returns to school and attends in-person classes.**

Thurs, 12:00 AM-2:15 PM

**As Josh follows a nurse to the Care Room, the nurse explains to Josh that he tested positive and takes time to reassure Josh.**

Tues, 12:10-12:15 PM

**Josh waits in the Care Room for his responsible adult to pick him up. A nurse or another staff member in PPE watches him.**

Tues, 12:25-1:30 PM

**After speaking to Josh and his responsible adult, the nurse calls Josh’s teacher and other staff members to continue contact tracing and learn more information. The nurse looks at seating charts (for Josh’s classroom and Josh’s school bus) and attendance records for the past two days to identify who else Josh may have been in close contact with and inform them. Once the nurse identifies Josh’s close contacts, they send an Excel sheet to the Dept. of Health informing the DoH who will be quarantined and for how long.**

**Source: Interviews with district leaders**
Josh – 1st grade GenEd student tests positive at school and…

What if…
- Josh’s responsible adult cannot pick him up
- Many students in Josh’s class are also quarantined
- Josh is on free or reduced lunch
- Josh then tests negative within 10 days of his positive test result

Key questions
- Where would Josh go if his responsible adult cannot pick him up? Who would supervise him?
- What happens to Josh’s class if several students test positive or are close contacts of someone positive?
- How does Josh continue to receive meal service during the day?
- What happens to Josh’s learning environment if he tests negative while in quarantine?

“Divergent” steps
- Josh stays in the Care Room and waits until a responsible adult can pick him up. He is supervised during this time by a nurse in PPE. At the end of the school day, if no one can pick Josh up, the staff work to reorganize the bus seating chart to significantly separate Josh to the back of the bus, ensuring he is several rows away from the other students.
- If a significant number of students in a class are quarantined, Josh’s principal or superintendent, after consulting with Josh’s teacher, may decide to move the class online for two weeks, and everyone in Josh’s class is temporarily shifted to remote learning.
- One day a week, the school has a day when they distribute 5 meals. While Josh is quarantining, Josh’s responsible adult can pick up the meals on that day.
- Josh is required to quarantine for the full 10 days following his positive test. The district will provide Josh with the technology resources he needs to attend class virtually unless he is temporarily too sick to participate.

Source: Interviews with district leaders
Case study 3 – Screening testing using molecular PCR

Urban district of ~90 schools with >45k students with 1/3 in-person and 2/3 fully remote (limiting and phasing in in-person reopening due to high community transmission rates)

In November 2020, district launched screening testing for all students and staff in a few schools

In addition to the opt-in molecular screening (focus of case study, described below), the district also has two other testing initiatives (diagnostic testing using mobile units through a collaboration with the county and required rapid screening testing for extracurricular activities)

Testing program design for molecular screening test program

<table>
<thead>
<tr>
<th>Testing objective</th>
<th>Type of test</th>
<th>Individual or pooled sample</th>
<th>Who is tested</th>
<th>Opt-in or required</th>
<th>Testing frequency</th>
<th>Sample type</th>
<th>Where sample is collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic</td>
<td>Antigen</td>
<td>Individual</td>
<td>Staff</td>
<td>Opt-in</td>
<td>Weekly</td>
<td>Saliva</td>
<td>At home</td>
</tr>
<tr>
<td>Screening</td>
<td>Molecular PCR</td>
<td>Pooled test (with individual samples)</td>
<td>Students</td>
<td>Required</td>
<td>Twice a week</td>
<td>Nasal swab</td>
<td>At school</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pooled test (with pooled samples)</td>
<td>Family</td>
<td>Random sample</td>
<td>Twice a month</td>
<td>Other</td>
<td>External site</td>
</tr>
</tbody>
</table>

Key enabling factors

- Program initially started with philanthropic funding and then received city and county funding
- School leaders invest in extensive community outreach (e.g., principals call parents to encourage testing; superintendent hosts townhalls)
- Nonprofit provides tests and supplies at cost, conducts testing, and takes responsibility for logistics of testing and collecting supplies

Impacts / benefits felt

- Increase in opt-in rates and interest for testing: Since Nov 2020, testing expanded from a few schools in high risk zip codes to ~90 schools; additionally, ~70% of in-person students and staff get tested; every week the number of people who opt-in increases
- Reassurance that positive cases are identified and students are safe in schools: School positivity rate is 0.3%; no evidence of transmission in schools (99% of identified spread came from the community; 1% is unknown)

Lessons learned

- The district initially managed contact tracing for student cases centrally but needed to shift to a local model led by campus nurses as the program expanded
- Stakeholder engagement of community leaders requires constant communication
- Scaling caused brief supply chain challenges; ensuing frustration by parents and staff was eased by messaging that things will improve

Parents and staff feel a lot safer and the feedback we’re getting is very positive. But you really have to have a tough skin and a soft heart to navigate this.

- Associate Superintendent

1. In-person students attend class 5 days per week but have flexibility on being in-person or remote; 2. Principals call parents to invite their students to attend school and get tested; while on the phone, they also ask about whether there are any high-risk individuals living with the student to ensure students feel comfortable remaining remote if necessary and proactive measures are taken to protect families

Source: Interviews; press search
3: The district provides weekly opt-in molecular screening testing for students and staff

Molecular PCR test provided to students and staff at school

Before returning

When a school is ready to invite more in-person students, the principal works with teachers to select students to invite to be in-person to limit the number of children per classroom.

The principal then calls a responsible adult caring for a student to invite the student back and to encourage the student to get tested on Thursday or Friday before returning.

During the call, the principal asks if anyone in the household is high-risk; if someone is, the principal advises the student remain remote until the high-risk household member can be vaccinated.

Testing at school

Students and staff self-administer tests weekly on Thursdays or Fridays.

~150 students are tested per hour by a non-profit that conducts testing through the day and then runs the analysis of samples in the lab.

Results take up to 24 hours and may be received while individuals are at home or are at school.

Alongside testing, the district is strict about wearing masks and keeping symptomatic students and staff out of school (e.g., if a teacher has a headache, the teacher is encouraged to stay home).

Positive results

If someone tests positive...

- Outside of school hours: An employee calls home to instruct the person to quarantine.
- During school hours: The person is sent home and instructed to quarantine. Students are brought to the Care Room while they wait to be picked up.

Contact tracing is conducted by campus nurses for students on school days and by a separate hired team of nurses on the weekend when deemed necessary.

While the non-profit supporting the district is currently utilizing an individual molecular PCR testing process, they plan to shift to a pooled approach to reduce test processing costs by 3-5x per test as their volumes increase.\(^1\)

1. The non-profit currently conducts 10,000 tests per day and needs to get to 50,000 tests per day to shift to pooled testing; the non-profit supports other districts and community groups beyond the district described.

2. If an early childhood or special needs student tests positive, contact tracing is completed over the weekend.

Source: Interviews with district leaders.
3: The district has two other testing initiatives in addition to the opt-in molecular screening testing

Diagnostic test provided through a mobile unit for staff, students, and community members

Through a county-community partnership, the district has a mobile testing unit on campus that is located at an easily accessible site every Wednesday from 8:30 AM to 3:30 PM. The testing unit is a drive-up site run by a non-profit. It moves across 6 different sites in the county through the week, one of which is the school district campus site.

The mobile unit conducts diagnostic testing to encourage community members to get tested regularly and to provide access to testing for symptomatic students and staff.

Unlike the screening testing the district provides in schools, the mobile unit:
- Is accessible to anyone (incl. remote students and staff, parents, and the community)
- Enables symptomatic and close contacts of positive individuals to get tested
- Is located outside of school buildings (to keep symptomatic individuals separated)

Another district also set up mobile testing units on school campuses to provide a more convenient testing option for students and staff. The district's schools are spread out over a broad and mountainous area, and existing community testing centers are not easily accessible to all. The mobile units started out as a diagnostic testing option for symptomatic students and staff and later expanded to also offer screening testing every ~10 days as they travel around the district. The mobile units conduct ~1,000 tests per week

Rapid test required for extracurricular activities

“Test to play” – Josh, a 1st grade student, testing before playing soccer

1 Josh arrives at school for a soccer game and lines up for a test.
   Sat, 2:00 PM

2 An athletic trainer in PPE hands Josh a swab. Josh swabs his nostrils, hands the swab back, and waits in a private area.
   Fri, 2:10 PM

3 The athletic trainer tells Josh he is negative and free to play.
   Josh plays soccer in his mask.
   Fri, 2:30 PM

Students are required to complete a rapid test once or twice a week when they participate in extracurricular activities (e.g., band, athletics, JROTC). The district trained athletic trainers to administer the rapid tests and nurses are available by phone to contact and support with contact tracing if anyone tests positive. Tests are taken before practice and games and are required for all students (in-person or remote)

---

1. Alongside the mobile testing unit on campus on Wednesdays, there is also a lab off-campus nearby where community members, students, and staff can get diagnostic tested Monday through Friday

Source: Interviews with district leaders
Case study 4 – Screening testing using pooled PCR tests

Small urban district of ~4k students with 2/3 in-person or hybrid and 1/3 fully remote
In Nov. 2020, district launched screening pooled testing for staff; in Feb. 2021, district expanded program for students;
Two different pooled testing methods are used: Staff undergo pooled saliva testing that provides individual results, while students undergo pooled nasal swab testing that requires more samples to identify individual results; the former method is more expensive but used for staff because it gets faster final positive results, preventing staff shortages (detailed on next slide)

Testing program design

<table>
<thead>
<tr>
<th>Type of test</th>
<th>Sample type</th>
<th>Where sample is collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antigen (rapid test)</td>
<td>Saliva</td>
<td>At home</td>
</tr>
<tr>
<td>Molecular - PCR</td>
<td>Nasal swab</td>
<td>At school</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>External site</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Testing objective</th>
<th>Individual or pooled sample</th>
<th>Who is tested</th>
<th>Opt-in or required</th>
<th>Testing frequency</th>
<th>Sample type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic</td>
<td>Individual</td>
<td>Staff</td>
<td>Opt-in</td>
<td>Twice a week</td>
<td>Saliva</td>
</tr>
<tr>
<td>Screening</td>
<td>Pooled test (with individual samples)</td>
<td>Students</td>
<td>Required</td>
<td>Weekly</td>
<td>Nasopharyngeal</td>
</tr>
<tr>
<td></td>
<td>Pooled test (with pooled samples)</td>
<td>Family</td>
<td>Random sample</td>
<td>Twice a month</td>
<td>Other</td>
</tr>
</tbody>
</table>

Key enabling factors
- State sponsored 6-week pooled testing program for all districts; the district decided to:
  - Use the program to begin testing students
  - Continue using another method to test staff for faster individual results (funded through city’s CARES Act)
- Community leaders (Superintendent and Mayor) championed the testing program
- The state requires testing to return to school for anyone who travels out of state

Impacts / benefits felt
- Consistent participation with a spike after the holidays: Since staff testing pilot started in fall 2020, ~350 staff members (~60% of in-person staff) are tested through their school every week, with some additional staff testing at public community sites instead. After holiday break in 2021, ~500 were tested through their schools
- Reassurance that positive cases are identified and transmission is minimized: At a drive-through event in January before schools reopened, of ~1.8k tests completed for staff and students, 1 staff member and 19 students were positive (~1%) – compared to the 5-9% community positivity rates

Lessons learned
- Pooled testing that requires more samples is a suitable method to test students but due to the time delays for individual positive results may be less viable for staff
- Testing results are timed after school hours or on weekends to ensure sufficient time for students to receive a follow-up test if needed
- Testing requires significant coordination and buy-in and planning for staffing

“...The most important thing to be thinking about is equity. We want to ensure that all students can be in school and have access to follow up testing or transportation."

– Chief of Opportunity and Response

1. K-2nd grade students and high-need students are in-person (high-need students make up ~15% of the district and include students who are in substantially separate settings, experiencing homelessness or foster care, new English learners, or without access to internet at home); 3rd-12th grade students are hybrid and attend classes just at the beginning of the week on Monday and Tuesday or at the end of the week on Thursday and Friday
2. Free individual PCR testing is also available near the district and some students and staff opt to get tested there instead

Source: Interviews with district leaders
4: In this case study, the pooled testing method used for staff does not require collection of additional samples to confirm a positive case.

Case study: staff pooled testing method

<table>
<thead>
<tr>
<th>Person 1</th>
<th>Person 2</th>
<th>Person 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample 1</td>
<td>Sample 2</td>
<td>Sample 3</td>
</tr>
<tr>
<td>Saliva test</td>
<td>Saliva test</td>
<td>Saliva test</td>
</tr>
</tbody>
</table>

Split individual samples into multiple parts (at lab)

Combine one part of each individual sample in one tube

Store remaining individual sample parts in individual tubes

Carry out PCR on the pooled sample

COVID-19 negative OR COVID-19 positive

If someone in her pool tests positive, Ms. Gomez’s journey looks the same as someone taking an individual molecular test.

Individual retest with remaining sample parts to identify positive individual(s)

Summary

In pooled testing for staff, if a joint sample comes back positive, it is possible to rerun each sample individually to identify positive individuals — and no new samples need to be collected. This collection method is ~3-5x more expensive per test than pooled testing that requires collection of additional samples to confirm a positive.

It is used for staff, like Ms. Gomez, to identify positive individuals quickly and prevent staff shortages.

Source: Interviews with district leaders

1. These individual sample parts are only used if the PCR on the pooled sample is COVID positive and a retest is required; if the pooled sample is negative, the individual samples are not used.

2. Pooled testing that does not require collection of additional samples is very cost competitive compared to pooled testing that requires a reflex test if there is a low positivity rate (because the cost of doing individual retests with remaining sample parts when a pool is positive is relatively expensive).
4: In this case study, the pooled testing method used for students does require collection of additional samples to confirm a positive case.

**Case study: student pooled testing method**

- **Person 1**  
  - Sample 1  
    - AN Swab
- **Person 2**  
  - Sample 2  
    - AN Swab
- **Person 3**  
  - Sample 3  
    - AN Swab

Combine all samples in one tube (at school)

Carry out PCR on the pooled sample

- **COVID-19 negative**
  - OR
  - **COVID-19 positive**

- **Person 1**  
  - Additional individual sample collection necessary to identify positive individual(s)
- **Person 2**  
  -
- **Person 3**  
  -

**Summary**

In pooled testing for students, if a joint sample comes back positive, it is not possible to rerun each sample individually to identify positive individuals – and new samples need to be collected. This collection method is used for students, like Josh, as it is typically more affordable.

When a student tests positive, the district provides all individuals in the pool with a rapid antigen test.

If no one in the pool tests positive on the antigen test, then the district runs individual PCR tests and anyone who tests positive must quarantine.

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1. Pooled testing that requires collection of additional samples to confirm a positive case is less effective in areas with a high positivity rate.
2. Students also have the option to go to a community testing site for a molecular PCR test.

Source: Interviews with district leaders
4: DILO simulation of Josh, a student, taking additional samples after testing positive in a pooled test

The district aims to test students a day before they would be home so that they do not receive their test results while on campus. Students grades K-2 – like Josh – are in-person all week and are tested on Thursday. Students on the hybrid schedule (either attending Monday and Tuesday or Thursday and Friday) are tested Tuesday or Thursday.

1. A responsible adult is an authorized individual who is allowed to sign the consent form and escort the student from school grounds. Source: Interviews with district leaders.
### Steps system leaders have taken to implement a testing strategy

<table>
<thead>
<tr>
<th>Collect consent to test and promote participation</th>
<th>Engage testing vendors and design testing operations</th>
<th>Estimate staff and supply needs and tracking processes</th>
<th>Stand up data management and reporting processes</th>
<th>Define a communications plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>What legal consent requirements exist?</td>
<td>What vendor options exist and how do they vary by cost, services provided, quality, and turnaround time?</td>
<td>How many people do you need to operate?</td>
<td>What data management services does your testing vendor provide?</td>
<td></td>
</tr>
<tr>
<td>How will you collect parent/guardian consent?</td>
<td>What testing model, facility layout, and operation flow works best for your test type, staffing resources, and available space?</td>
<td>How many supplies (e.g., PPE, test kit, cleaning kit) do you need per test, per day, and per month?</td>
<td>How will you collect and store information securely and legally?</td>
<td></td>
</tr>
<tr>
<td>What are the key barriers to participation?</td>
<td>How will you track, store, order, transport, and dispose of inventory?</td>
<td>How will you track, store, order, transport, and dispose of inventory?</td>
<td>How will you report results to individuals and the broader community?</td>
<td></td>
</tr>
<tr>
<td>How will you mitigate against them?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### In action

- **In Providence, Rhode Island, guardians fill out a survey online to provide consent.** The school district also provides physical forms.
- **In Washington, DC, a public charter school designed a drive-through set up for screening testing because it was outdoors and served as a single, centralized location.**
- **In Texas, the Texas Education Agency (TEA) coordinates inventory allocation across schools and requires that each maintain a weekly inventory tracker.**
- **In Tulsa, Oklahoma the superintendent strengthened existing data infrastructure by partnering with a non-profit to design a reporting system.**
- **In New York City, New York, the district distributed a video indicating testing procedures to build comfort and familiarity with the process.**

Source: The Rockefeller Foundation's Covid-19 Testing in K-12 Settings: A Playbook for Educators and Leaders
Actions system leaders have taken to roll out a testing program

A few weeks before launch districts have...
- Conducted **onboarding sessions** to prepare staff for operations roll out (e.g., on use of PPE; workflow of test site; waste management policies)

A few days before launch...
- Confirmed **inventory** and inventory management plans
- Ensured scheduling, registration, data management, and results notification **systems are ready to go-live** (where applicable)
- Conducted **dry runs** and final checks of all processes and systems

When activating test sites, districts and schools have...
- Documented a **day-of testing timeline** to help guide staff (example included in appendix)
- Established **day-of routines** to stand up the test site, including:
  - **Test Site Operations Checklists** of procedures to set up testing sites
  - **Test Site Teardown Checklists** of procedures to close down testing sites
  - **Staff walkthroughs of roles**, including traffic flows; locations of critical supplies; and meetings before shifts to discuss updates
  - **Clear signage and communication**

In Ector County, Texas the district implemented the testing program using a phased approach, testing staff and then students and staff, to slowly scale operations. Additionally, some non-campus staff volunteered to be tested before the launch so nurses could practice and troubleshoot their testing operations.

A Test Site Operations Checklist asks questions about logistics, communication, site storage, and reporting (e.g., standardized labeling convention for samples?)

A Test Site Teardown Checklist asks questions about specimen handling, inventory management, and cleaning and waste disposal (e.g., Have all biohazard bags been double bagged and secured?)

Source: The Rockefeller Foundation's Covid-19 Testing in K-12 Settings: A Playbook for Educators and Leaders
After rolling out testing programs, schools and districts have monitored and evaluated them

**Districts and schools have tracked progress toward milestones and objectives**

The testing task force might have a timeline to review the metrics and regularly report out progress and findings to the school community at large.

Using the defined objectives and metrics, they might set thresholds based on updated data to guide decision making.

Thresholds may include increasing testing when community prevalence crosses a certain level; deploying certain protocols to extra-curricular activities when test positivity rate meets a threshold; or shifting to a hybrid model when certain risk factors have been observed.

**IN ACTION:**
The National Governors Association has compiled a summary of COVID-19 metrics and thresholds that states and school districts can use to support their decision making.

**TAKE THE FIRST STEP:**
Review the decision making framework created by Chiefs for Change around school reopening decisions and testing models to use based on thresholds (here starting on slide 14 and here on page 11).

While collaborating with other stakeholders and creating transparency

Public health officials on the task force can help define thresholds that will be tracked and reported.

Districts might consider joining Communities of Practice or school networks to share best practices and ask questions other leaders.

Publishing results of the testing program can create transparency and community trust.

Example: publicly available dashboard from Jeffco, CO

Source: The Rockefeller Foundation’s Covid-19 Testing in K-12 Settings: A Playbook for Educators and Leaders
Districts reported four key considerations for COVID-19 testing programs and potential enabling factors for each:

<table>
<thead>
<tr>
<th>Testing strategy considerations</th>
<th>Potential enabling factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Costs of tests and supplies</strong></td>
<td>• <strong>Government support:</strong> Some states, counties, or cities purchased tests for districts, sometimes using local CARES Act funding</td>
</tr>
<tr>
<td>Costs can be material in districts with limited resources and vary widely based on test type and volume (e.g., antigen tests may cost $5-20, while PCR tests range from $15-150 based on vendor, volumes, and testing method – pooled or not)</td>
<td>• <strong>Philanthropic/non-profit support:</strong> Some districts received philanthropic funding to purchase tests or identified non-profit testing organizations to conduct testing at-cost</td>
</tr>
<tr>
<td><strong>Staff needed</strong></td>
<td>• <strong>Repurposed staff:</strong> Many districts trained their staff to play new roles (e.g., one district trained athletic trainers to administer rapid tests)</td>
</tr>
<tr>
<td>Additional staff may be required to administer tests, manage data, contact trace, and run programs (some districts estimated labor costs were one-half to two-thirds of their total testing costs)</td>
<td>• <strong>External staff:</strong> A few districts hired external staff to support in new roles, sometimes using government support (e.g., one district hired a team of nurses to contact trace on weekends when school nurses were off)</td>
</tr>
<tr>
<td><strong>Significant logistical feat</strong></td>
<td>• <strong>Partnerships:</strong> Districts cited partnership (e.g., with local public health agencies, academic institutions, non-profits) as being a critical support in planning and executing operations and in building trust</td>
</tr>
<tr>
<td>Significant planning, coordination, and careful implementation is required to set up programs and build trust in the community</td>
<td>• <strong>Phased approach:</strong> Many districts cited that pilot testing for a few iterations built confidence and allowed team to iron out details</td>
</tr>
<tr>
<td><strong>Consent needed for students</strong></td>
<td>• <strong>Community engagement:</strong> Districts shared that a strong communications campaign that listens to the community and provides consistent, transparent messaging is important to build trust and confidence in school-based testing amongst students and staff</td>
</tr>
<tr>
<td>All underage students require consent from a responsible adult before tests are administered; this requires time and effort by the district to collect forms</td>
<td></td>
</tr>
</tbody>
</table>

Implementing testing is actually easier done than said. It is easier to do it than it is to explain!

—District leader

Design choices and sample options for each choice.

<table>
<thead>
<tr>
<th>Testing objective</th>
<th>Type of test</th>
<th>Individual or pooled sample</th>
<th>Who is tested</th>
<th>Opt-in or required for in-person</th>
<th>Testing frequency</th>
<th>Sample type</th>
<th>Where sample is collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic</td>
<td>Targeted testing of symptomatic individuals and close contacts of those infected (5-7 days after close contact exposure) to check suspected cases for individual clinical decision-making. Foundation of testing program should always be ensuring that symptomatic individuals and the close contacts of positive cases can access testing (whether onsite at school or through referrals to a community testing resource)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screening</td>
<td>Routine testing of individuals without symptoms or any reason to suspect exposure. Given pre-symptomatic and asymptomatic infection spread, screening testing aims to reduce infection spread by isolating potentially infected individuals faster. Recommended frequency to be at least 1x weekly testing with rapid turn-around of results for the entire population (lower frequency or some percentage of the population not opting-in to testing will reduce the effectiveness of this method to break chains of transmission)</td>
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</tr>
<tr>
<td>Surveillance</td>
<td>Testing to understand prevalence in a community to inform workplace, local, or regional policies. Individual results are not returned so isolation and contact tracing is not possible.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: The Rockefeller Foundation's COVID-19 Testing in K-12 Settings: A Playbook for Educators and Leaders, CDC
### Design choices and sample options for each choice.

<table>
<thead>
<tr>
<th>Type of test</th>
<th>Sample type</th>
<th>Where sample is collected</th>
<th>Testing frequency</th>
<th>Who is tested</th>
<th>Opt-in or required for in-person</th>
<th>Testing objective</th>
<th>Where sample is collected</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antigen</strong></td>
<td>Rapid diagnostic test, processed on site, results given in ~15mins, at a cost of ~$5-20/test (cost of test and test processing)</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Sensitivity (i.e. probability of detecting an infected individual) ranges from 30-80% compared to PCR test. Sensitivity is higher for symptomatic individuals and lower for asymptomatic (one FDA-approved rapid test had a sensitivity of 80% among symptomatic persons and 41% among asymptomatic persons)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Antigen testing might be preferred when frequency of retesting and time to results is more important than highly accurate tests. Confirmatory tests may be needed for individual clinical decision-making</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Molecular – PCR</strong></td>
<td>Typically take 24-48 hours to receive results (actual times may be considerably longer based on operational considerations and backlogs), at a cost of ~$30-100/test (cost of test and test processing) for an individual PCR test (pooled tests can be ~3-5x cheaper). They are more sensitive (i.e. more likely to detect an infected individual)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>PCR (Polymerase Chain Reaction) are the most common molecular tests, though other types, such as LAMP (Loop-Mediated Isothermal Amplification Process) and NGS (Next Generation Sequencing), also detect viral genetic material to diagnose active infection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Serology</strong></td>
<td>Serology tests analyze blood to look for the antibodies a person has produced to fight a past SARS-CoV-2 infection. However, as these tests are not designed to find active infections, antibody tests are not recommended in the surveillance, screening, or diagnostic testing in K-12 schools</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
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Source: The Rockefeller Foundation's COVID-19 Testing in K-12 Settings: A Playbook for Educators and Leaders, CDC
Design choices and sample options for each choice. Click on any for more detail

<table>
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</thead>
<tbody>
<tr>
<td><strong>Testing objective</strong></td>
</tr>
<tr>
<td>Individual</td>
</tr>
<tr>
<td>Pooled</td>
</tr>
</tbody>
</table>

Pooling is potentially an especially good fit where there are natural cohorts – homeroom classes in grades K-5, or athletic teams, for example – because those groups are frequently considered close contacts.

One form of pooled testing may require a second **reflex** test. To identify positive individuals it is necessary to collect new samples for each individual. In this form of testing, samples are combined so it is not possible to rerun each sample individually.

Other pooled testing processes use only a portion of the sample in the pooled processing, so they can use the remainder for rerunning individual tests if necessary. Here the combined sample is joined at the lab using a part of each individual sample, it is then possible to rerun each sample individually to identify positive individuals without requiring a second sample.

Source: The Rockefeller Foundation's COVID-19 Testing in K-12 Settings: A Playbook for Educators and Leaders, CDC.