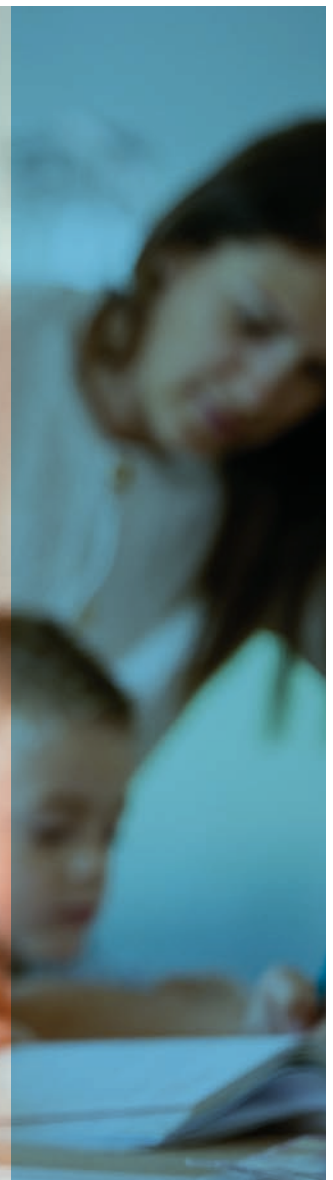


## Considerations for Effective Radon Risk Reduction Requirements for Schools



# Overview

Radon is a naturally occurring, radioactive gas that is invisible, odorless and tasteless. It is the second leading cause of lung cancer in the United States. The only way to identify elevated radon levels is through testing, and the only way to effectively reduce radon levels is through mitigation. Because children, youth and school staff spend significant amounts of time indoors, schools are a critical setting for preventing radon exposure.

The Environmental Protection Agency (EPA) recommends that all schools nationwide test for radon and mitigate if levels are elevated.<sup>1</sup> However, there are no federal requirements that require radon testing or mitigation in schools. This provides an opportunity to strengthen and expand radon risk reduction requirements at the state level.

To address this issue, the American Lung Association (Lung Association) gathered experience from states that have adopted and implemented radon requirements in schools. This document highlights lessons learned from these states and offers considerations for key stakeholders seeking to develop and implement school radon requirements that are effective, feasible and protective of public health.



## Key Takeaways

- Radon is found in schools, homes and other buildings nationwide. Developing and implementing school radon requirements is a key component to reducing radon exposure and preventing lung cancer in local communities.
- The Lung Association analyzed school radon requirements among states across the country by reviewing existing requirement language and conducting thought leader interviews. Experience from states implementing school radon requirements shows that an intentional, comprehensive approach can effectively advance radon risk reduction across communities.
- Effective radon requirements for schools are those that clearly:
  - 1 Outline comprehensive testing procedures, prompt schedules and timely mitigation.** Often, this includes aligning testing and mitigation requirements with ANSI/AARST standards.
  - 2 Define certification or training requirements for individuals conducting radon testing.** This is especially important for states that do not have professional credentialing requirements for performing radon testing and/or mitigation in schools. Radon mitigation should be completed by a credentialed professional.
  - 3 Identify and allocate resources to support implementation and compliance** including financial and technical assistance.
  - 4 Involve the appropriate state agency(ies)** that can provide technical guidance and support school operations. This usually includes the agency where radon technical experts are housed along with the Department of Education.
  - 5 Establish specific reporting requirements and timelines** for the appropriate state agency(ies), school administration and community members.
- Reducing radon is public health protection. Public health best practices include conducting periodic evaluation of programs and requirements to identify and correct issues to effectively protect communities from public health risks, such as radon-related lung cancer.

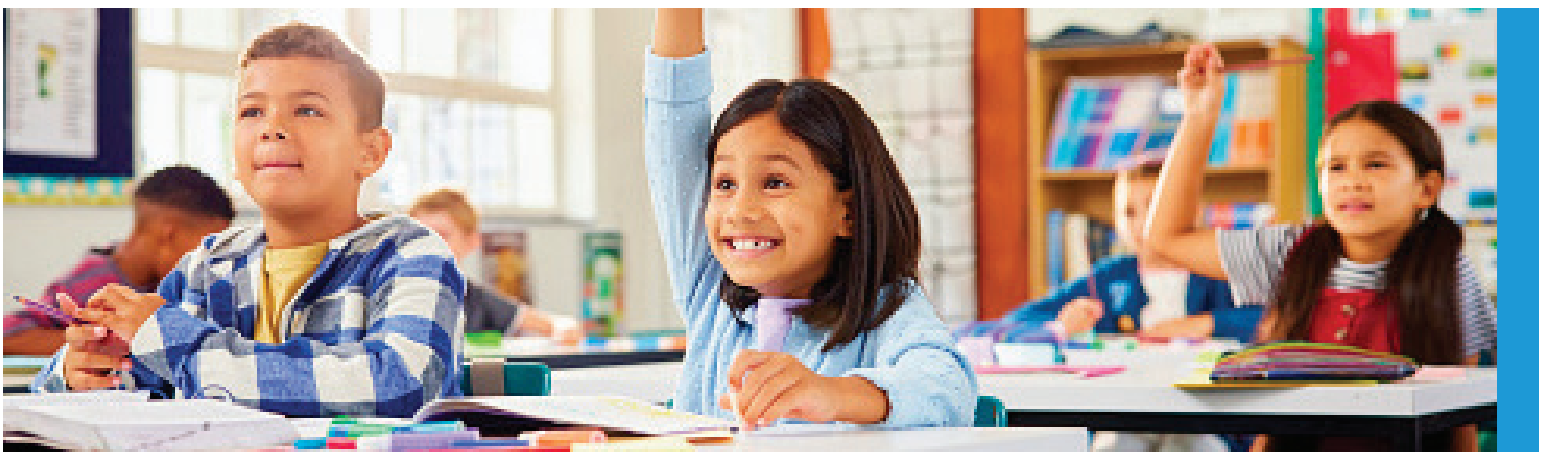
## Why Radon Testing in Schools Matters

Radon is an environmental health hazard that often remains unaddressed in school buildings. The EPA estimates more than 70,000 schoolrooms have radon levels above the action level of 4pCi/L.<sup>1</sup> Children are particularly vulnerable to the impacts of indoor air pollution in school buildings, including chronic radon exposure, due to prolonged time spent in school, faster breathing rates and developing respiratory systems.<sup>2,3</sup> School staff may experience cumulative exposure over the course of their employment. Accordingly, radon testing and mitigation in schools should be considered critical public health and occupational safety measures.

Radon enters buildings from the underlying soil through cracks and openings in the foundation and slab and can be present at elevated levels indoors. As is the case with homes, radon can enter both new and old schools and buildings with and without basements. Additionally, elevated radon levels can be present in one building even if a nearby building has low levels as well as in areas that have been designated as a low-risk zone.

Because radon is invisible and odorless, testing is the only reliable method to determine if students and staff are being exposed to elevated levels of radon gas. Radon gas is measured in picocuries per liter (pCi/L). If average radon levels within the school building are equal to or above the EPA's action level of 4 pCi/L, a radon mitigation system should be installed to reduce radon levels and protect students and staff from preventable, radon-related lung cancer. The Lung Association and EPA recognize that there is no known safe level of radon exposure, so schools should also consider reducing radon levels when measured average levels are between 2 and 4 pCi/L.<sup>4</sup>

Beyond the health and economic benefits, addressing environmental health risks in school buildings also advances transparency and accountability. School districts can demonstrate due diligence and reduce potential reputational risk by implementing radon requirements that are effective in preventing radon-related lung cancer. Clear reporting requirements also help ensure that parents, staff and communities are informed of environmental conditions in school buildings and of measures taken to reduce staff and student exposure. Public notification of school radon testing and mitigation also raises awareness that encourages community members to test their homes for radon.

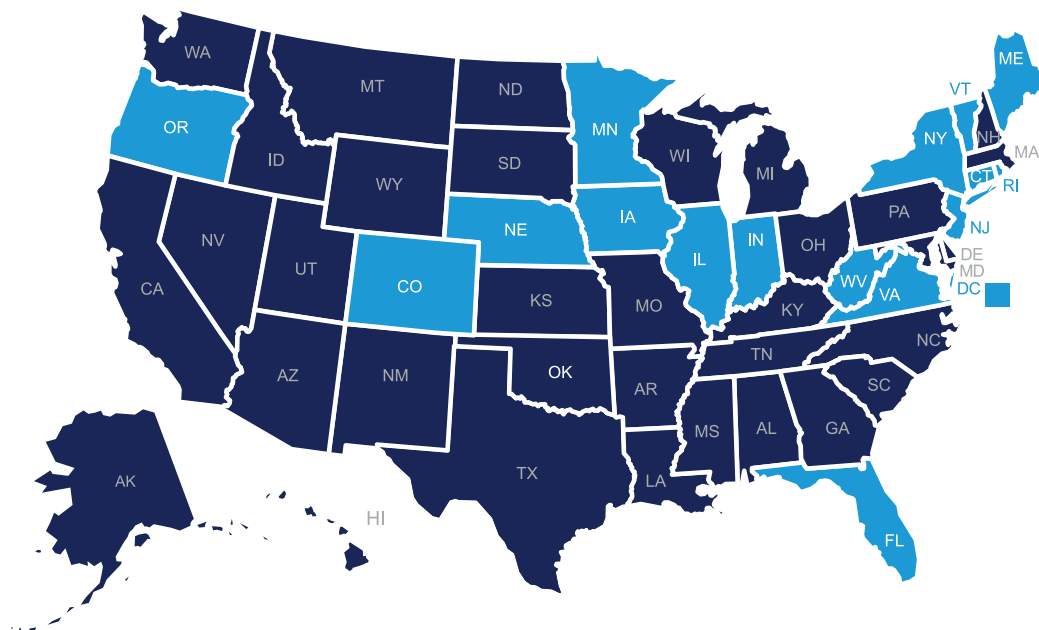


## Lessons Learned from States Implementing Radon Requirements

The Lung Association reviewed radon requirements in 17 states that have some radon-related requirements for school buildings. Requirements were reviewed to identify where they were consistent with the American National Standards Institute/American Association of Radon Scientists and Technologists (ANSI/AARST) standards for [radon testing and mitigation for effective radon risk reduction](#). Ten of the states require radon testing in school buildings with four of the ten requiring mitigation if radon levels are elevated. Model language and a summary of the 17 state school radon requirements can be found through the Indoor Environments Association’s [School Radon Testing Toolkit](#). The Lung Association focused further review on these ten states’ radon requirements. All ten requirements that include radon testing were compared among one another to gain an understanding of the landscape of radon testing and mitigation requirements across the country. This revealed that existing state-level radon requirements for schools vary widely, including:

- Radon credentialing requirements for radon professionals
- Available radon resources and technical support
- Radon mitigation requirements for schools with elevated levels
- State agency authority and involvement
- Compliance investigations and enforcement
- Requirements and methods for data collection and reporting
- Training requirements for school administration and personnel

The Lung Association invited relevant agencies and organizations involved with developing, implementing or supporting school radon requirements in the ten states that require radon testing or mitigation to participate in a thought leader interview with Lung Association staff to learn more about successes and challenges in implementing radon requirements as written. The states of Colorado, Iowa, Oregon and Vermont accepted the invitation and participated in a thought leader interview. The next page shows a summary of radon requirements in these four states.



● States that have some radon-related requirement in schools    ● States with no radon-related requirements in schools

| Component                                                          | Colorado <sup>5</sup>                                | Iowa <sup>6</sup>                                                                                                           | Oregon <sup>7</sup>                                                                                       | Vermont <sup>8</sup>                                                                                                                                          |
|--------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General State Radon Program/Requirement Components                 |                                                      |                                                                                                                             |                                                                                                           |                                                                                                                                                               |
| Agency where radon program operates                                | Colorado Department of Public Health and Environment | Iowa Department of Health and Human Services                                                                                | Oregon Health Authority                                                                                   | Vermont Department of Health                                                                                                                                  |
| Credentialing requirements for radon professionals<br>School Radon | ✓                                                    | ✓                                                                                                                           |                                                                                                           |                                                                                                                                                               |
| School Radon Requirement Implementation Components                 |                                                      |                                                                                                                             |                                                                                                           |                                                                                                                                                               |
| When school radon requirement was enacted                          | 1991                                                 | 2022                                                                                                                        | 2016                                                                                                      | 2021                                                                                                                                                          |
| Requires certified radon professionals conduct testing in schools  | ✓                                                    | ✓ – or district employees that complete an Iowa Department of Health and Human Services approved training                   |                                                                                                           |                                                                                                                                                               |
| Specifies adhering to ANSI/AARST radon testing protocols           | ✓                                                    | ✓                                                                                                                           |                                                                                                           | ✓                                                                                                                                                             |
| Investigations for compliance                                      | ✓                                                    |                                                                                                                             |                                                                                                           |                                                                                                                                                               |
| Includes requirements for providing resources and/or support       |                                                      |                                                                                                                             | ✓ – in partnership with Oregon School Board Association                                                   |                                                                                                                                                               |
| Requires Mitigation if elevated radon levels are found             |                                                      | ✓                                                                                                                           |                                                                                                           |                                                                                                                                                               |
| Identifies agency that governs school radon requirement            | Colorado Department of Public Health and Environment | Iowa Department of Education with support from Iowa Department of Health and Human Services for district employee training. | Oregon Health Authority                                                                                   | No state agency is specified for authority of technical assistance, direction, or enforcement (the Vermont Department of Health offers support independently) |
| Mandates how results are reported                                  | On file at each school and available for review.     | Published on district's website in a timely manner.                                                                         | Provided to the district school board, Oregon Health Authority, and results listed on district's website. | Made available to employees and students.                                                                                                                     |

### Thought leader interviews included:

- ✓ How the current radon requirements were passed
- ✓ Who was involved in developing specific language of the requirement
- ✓ What agency enforces the requirements and guidelines for compliance
- ✓ Capacity of the governing agency to provide technical assistance to school officials
- ✓ Availability of resources and funding to support implementation of the requirements
- ✓ Feasibility of testing for school administration in accordance with how the requirement was written
- ✓ Reporting and notification to community members
- ✓ Other successes and challenges

## Considerations for Written Requirements

To be proactive in designing effective and practical requirements, advocates and key decision-makers are invited to take the following five considerations into account when developing radon risk reduction requirement language for schools to ensure that implementation of requirements is feasible, enforceable and ultimately successful in preventing radon-related lung cancer.

### 1. Clear & Definitive Language for Testing and Mitigation Procedures

When drafting school radon risk reduction requirements, experience from states with effective requirements underscores the importance of specificity and practicality. Effective requirements are those that clearly define a comprehensive testing scope, optimized testing timelines, thorough reporting obligations and timely mitigation requirements resulting in high compliance with radon requirements and prevented radon exposure. Ambiguous or incomplete statutory language can lead to inconsistent implementation and missed public health protection. This can also place a burden on the governing agency working to track results and enforce compliance.

#### Considerations

Regardless of radon credentialing requirements in the state, effective radon requirements for schools include clear timelines for when all radon testing and mitigation should be completed and tend to align testing and mitigation requirements with those outlined in the ANSI/AARST standards. This includes clearly stating:

- **Testing scope** – 100% of occupied ground contact and 10% of occupied upper floor rooms should be tested.
- **Testing timelines** – If elevated radon levels are found, secondary testing should be conducted to confirm levels before determining if mitigation is needed. Another test should be conducted within 24 hours to 30-days after mitigation system installation. It is recommended to test every 2 years for buildings with a mitigation system and every 5 years for buildings without a mitigation system.
- **Reporting requirements** – Radon results and mitigation plans should be reported within 30 days of the school receiving the results.
- **Mitigation timelines** – Mitigation efforts should commence promptly after receiving confirmation of elevated radon levels.

## 2. Who Conducts Radon Testing and Mitigation

Clear language regarding who conducts radon testing and mitigation is essential to ensure accuracy, consistency and public confidence. In states that require radon professionals to obtain a license or certification, requirements typically specify that radon measurement and mitigation must be conducted by professionals credentialed through nationally recognized programs such as the [National Radon Proficiency Program \(NRPP\)](#), the [National Radon Safety Board \(NRSB\)](#), or sometimes state-licensed or certified professionals. Credentialing helps ensure adherence to recognized protocols, quality assurance procedures and ethical standards. View the Lung Association's resource for [State Credentialing of Radon Service Providers Saves Lives](#).

Regardless of credentialing requirements, states sometimes allow schools or districts to conduct testing directly and sometimes require specific training for school administrators or personnel.

### Considerations

Effective school radon risk reduction requirements outline that school radon testing should be conducted by a person certified through national or state training programs. Radon mitigation should be completed by a credentialed professional. Some benefits to aligning testing practices with national ANSI/AARST standards especially among states without formal credentialing requirements, includes:

- Strongly encouraging the use of NRPP or NRSB certified radon measurement and mitigation professionals.
- Clearly stating specific testing protocol requirements that incorporate or reflect those outlined in the ANSI/AARST consensus standards such as testing 100% of occupied ground-contact rooms and 10% of occupied upper floor rooms. The Lung Association's [Radon Measurement Guidance for Schools](#) provides a summary of these requirements.
- Emphasizing documentation, quality control and repeatability of results.



### 3. Resources Needed for Implementation

Even in cases where testing or mitigation is required, implementation challenges remain. One of the most challenging issues reported is insufficient funding for schools to adhere to radon requirements. Some states may offer funding for schools to test for or mitigate radon while other states may require or allow school districts to use general facility maintenance or environmental dollars. Since concern about further dividing scarce resources for schools can cause public education stakeholders to oppose radon requirements, either existing funds might be expanded to include radon work or new funding streams can be developed. Insufficient funding can also mean a lack of technical support from radon experts, creating another barrier for school districts seeking to adhere to requirements. The state's radon program is often seen as a critical stakeholder in the development and implementation of radon requirements for schools, but without sufficient funding or clear role assignment, that program may lack the capacity to support and enforce requirements. After elevated levels are identified, unclear responsibility for follow-up testing and delays in (or absence of) mitigation can pose challenges to achieving the goal of reducing radon.

Certain communities face higher barriers to radon education, resources and services due to geographic isolation, investment challenges, technology gaps and more. Requirements that fail to address funding or technical assistance risk inconsistent public health protection across communities.

#### Considerations

Engaging radon technical experts from the state's radon program or public health department when drafting radon requirements for schools can help to identify what is needed to build capacity for providing technical support. Funding sources for radon risk reduction in schools can strongly impact the timeline for radon mitigation, yet there are currently no best practices identified for funding these requirements. Funding remains an implementation issue that should be discussed during the developmental stages of drafting radon risk reduction requirements for schools. Engaging all appropriate agencies and technical experts in a conversation around funding and capacity can help to enhance school confidence and compliance in implementing requirements.



## 4. Governance and Agency Authority - Selecting the Lead Agency & Role of Education Agencies

Clear assignment of authority to provide technical assistance to schools and enforce radon requirements is essential. In states with effective requirements, key stakeholders often viewed state radon program directors as experts and included the agency in which the state radon program is housed in initial conversations around development of radon risk reduction requirement language. Many states also include the Department of Education in development and oversight of radon requirements in schools to foster trust with schools, integrate radon requirements with other management guidelines for schools, secure funding and prioritize a healthy learning environment. Both the state radon program and the state Department of Education are trusted leaders in local communities and offer different perspectives on implementation of radon requirements for schools.

The governing agency's role requires significant capacity. Experience shared by governing agencies has shown a clear need for financial assistance to support the implementation of radon requirements. When requirements do not proactively authorize funding to support the agency's new responsibilities, oversight of radon requirements can place a large burden on governing agencies, ultimately reducing the quality and effectiveness of required activities and leading to missed opportunities for public health protection. Examples of these activities include:

- Developing technical guidance, templates and model plans specific to state requirements
- Enforcing compliance and tracking results
- Conducting outreach and education to school districts
- Evaluating requirement implementation to identify barriers and adjustments needed
- Sometimes hiring a full-time temporary staff person to manage implementation demands

### Considerations

Agencies with credibility as trusted health educators, experience in implementing requirements around other environmental health hazards (such as lead or mold), and the ability to collaborate across agencies should be involved in the draft and implementation stages of radon requirements for schools. Experience from states suggests that while health agencies are well-suited to lead on technical guidance, a formal partnership with education agencies can strengthen integration into school operations and improve long-term outcomes.

Identifying the best agency to govern radon requirements involves determining which agency(ies):

- House radon technical experts
- Currently enforce indoor air quality requirements in schools
- Serve as trusted messengers for school districts statewide
- Have the capacity to develop guidance, enforce compliance, track results and conduct education

Financial support for governing agencies is not often included in current radon requirements but should be considered moving forward given lessons learned.

## 5. Reporting & Communicating Radon Test Results and Mitigation Plans

Radon requirements for schools that establish specific, timely notification procedures to the appropriate state agency(ies) and community members have resulted in more successful compliance while increasing public trust and confidence among parents, educators and staff. Consistent data collection also helps ensure long-term efficacy (regular re-testing as outlined in the ANSI/AARST standard for radon testing), inform resource allocation and guide evidence-based decisions for future school health or environmental requirements.

### Considerations

It is important to clearly define the parties to whom radon results and mitigation plans must be reported (parents, staff, state radon program, department of health, etc.) and what metrics are required in reporting to each stakeholder. Metrics can include the dates that radon tests were conducted, type(s) of tests used, protocols followed, testing locations, building conditions, who deployed and retrieved test devices, dates and performer(s) of testing device analysis, radon results, secondary testing dates and results, evidence of mitigation when necessary and post-mitigation radon results.

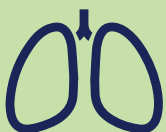
### Additional Resources



Historical and existing state radon requirements for schools can provide useful background on addressing radon in school buildings. The Environmental Law Institute provides a [summary of these requirements](#) and the Indoor Environments Association provides [radon risk reduction resources](#) for those addressing radon in school buildings.



Existing requirements that clearly follow ANSI/AARST [standards for radon testing and mitigation](#) ensure that accurate radon testing and effective mitigation take place to protect building occupants against radon related lung cancer. These standards are summarized in the Lung Association's the [Radon Measurement Guidance for Schools](#) factsheet and in the EPA's [Radon Standards of Practice](#) webpage.



A comprehensive approach to addressing radon in school buildings requires coordination with other [state indoor air quality \(IAQ\) policies in schools](#) such as mold, pesticide, green cleaning, tobacco, ventilation or written IAQ management plan standards.

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The American Lung Association received financial support from the EPA under assistance agreement 84099501-1. This document does not necessarily reflect the views and policies of the EPA.

### About the American Lung Association

The American Lung Association is the leading organization working to save lives by improving lung health and preventing lung disease through education, advocacy and research. The work of the American Lung Association is focused on four strategic imperatives: to defeat lung cancer; to champion clean air for all; to improve the quality of life for those with lung disease and their families; and to create a tobacco-free future. For more information about the American Lung Association, which has a 4-star rating from Charity Navigator and is a Platinum-Level GuideStar Member, call 1-800-LUNGUSA (1-800-586-4872) or visit: [Lung.org](https://lung.org). To support the work of the American Lung Association, find a local event at [Lung.org/events](https://lung.org/events).



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