SPACE TYPES & REQUIREMENTS

Science Laboratory

School Type: E M H

Functional Area Descriptions
The Science Lab is a space designed to support flexible, dynamic scientific and technological exploration. This space should be designed to support a variety of learning strategies and educational applications. This space should be open and flexible, have access to utilities, good ventilation, and be equipped with durable floor and countertop work surfaces. Laboratories should provide work environments in which practical application of instruction and skills practice may be accomplished effectively and safely.

At the elementary school level, a Science/STEM Exploration area shall be included in the Learning Hub within each Neighborhood. See the Neighborhood Ed Spec for further information.

The number of science labs for middle and high school is calculated based on the National Science Teachers Association (NSTA) Guide to Planning School Science Facilities 2007 guidance and teacher/class rotations. Refer to the NSTA Guide for additional information on the design of science labs, prep rooms and chemical storage rooms.

Creative grouping of labs or pairing with Learning Studios, CTE or Art is an acceptable design option to encourage multidisciplinary collaboration.

Adjacency Diagram

Planning Requirements

<table>
<thead>
<tr>
<th>Area Description</th>
<th>SF</th>
<th>M²</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science Laboratory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Science Laboratory—MS</td>
<td>1,100</td>
<td>102.2</td>
<td></td>
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<tr>
<td>1 Science Laboratory—HS</td>
<td>1,200</td>
<td>111.5</td>
<td></td>
</tr>
<tr>
<td>2 Prep Room</td>
<td>200</td>
<td>18.6</td>
<td>Per Lab</td>
</tr>
<tr>
<td>3 Chemical Storage Room</td>
<td>100</td>
<td>9.3</td>
<td>One per school</td>
</tr>
<tr>
<td>4 Staff Collaboration **</td>
<td>175</td>
<td>16.3</td>
<td>Standard Allowance per Lab</td>
</tr>
<tr>
<td>5 Learning Hub Allowance</td>
<td>350</td>
<td>16.3</td>
<td>For each MS and HS Lab</td>
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**Staff Collaboration includes 75 SF personal workstation; 25 SF personal storage; 10 SF kitchenette allowance; 30 SF collaboration allowance and 35 SF shared storage allowance.
1 Science Laboratory
At the middle school level Multipurpose Science Labs shall be provided. It is often appropriate to distribute these labs on a grade level basis. Efficiency of utilities should be considered in the placement of the labs, even if they are distributed to each Neighborhood. Consider a solution that allows grouping of the labs, possibly between Neighborhoods so that they can share a prep room and utility connections.

At the high school level both Multipurpose Science Labs (Physics, Earth Science, etc.) and Chemistry/Biology Labs shall be provided. Labs may be located between Neighborhoods, allowing access from outside the Neighborhood as well as a connection to the Neighborhood learning hub. Labs may be grouped together to create a science Neighborhood, grouped with additional studios for a Math/Science or multidisciplinary Neighborhood, or grouped with CTE to create a STEM Neighborhood.

Equipment and casework should be positioned for ease of cleaning around their bases and cabinets should fit flush to walls. Storage should be located convenient to work areas so that a minimum of travel and congestion results. Wide aisles should be positioned between work stations, in front of storage cabinetry, and around fixed equipment. More expensive items, especially those that are used occasionally, will require a storage location that can be secured, either in the lab, prep room, or in the Staff Collaboration Shared Storage area.

All labs shall have a minimum of two (2) exits from room with doors opening outward. Handicapped accessibility is required in all labs.

All labs should provide space for the following:
- Built-in storage and countertops on at least 2 sides of the room
- Countertop material of resin or acid-resistant plastic laminate
- Built-in storage - variety of open, closed, and lockable
- Upper cabinets glazed for display of projects and glassware
- Work tables and lab seating
- Teaching station (mobile or fixed)
- Hanging display area [i.e. atom models, DNA models, cells, etc.]
- Flexible or multiple display surfaces
- Interactive white board
- Magnetic marker board
- Water and utilities

Multipurpose Science Lab
The Multipurpose Science Lab requires the use of a coordinated system of movable lab tables and built-in perimeter casework to allow the conversion of the space from one use to another. Include storage and countertop on at least two sides of the room. Provide six student sinks spaced far enough apart for independent lab group work. Provide goose-neck faucets at all science lab sinks. In the high schools, where the lab will be used for Physics, there shall be at least one long run of counter uninterrupted by sinks and the number of sinks may be reduced but may not
be less than 2 per lab. Electrical and data outlets shall be provided at the perimeter casework. Provide appropriate separation of power and water for the safety of the students. Computers and printers are an integral part of the curriculum and must be considered in the design of the lab. The use of gas is not required in the Multipurpose Lab. Middle school multipurpose science labs shall be equipped with an emergency eye-wash/shower as described in the Chemistry/Biology Lab section below.

Chemistry/Biology Lab (HS only)
Chemistry and Biology Labs require additional equipment, such as access to gas, a fume hood, and an emergency eye-wash/shower. Utilities (gas, water, power, and data) should be provided at the lab stations, rather than at the perimeter of the room. Balance the need for surface area at the lab stations with the need for clear circulation paths to help insure the safety of the students. Gas shall be piped to the lab stations from a central source. Use natural gas line when readily available. A single easily accessible shut-off valve shall be provided in each lab to turn the gas off to all lab stations in that lab. An emergency shut-off switch shall also be provided for the electrical outlets in each lab. Provide goose neck faucets at all science lab sinks.

Safety equipment shall include eye goggle sanitation cabinets and a combination emergency deluge shower and eye wash (meeting ANSI standards). Modesty curtains are not required by ANSI but are highly recommended for school environments. A floor drain shall be provided. Slope the floor to a floor drain located below the shower head. The floor drain shall include trap primer and shall be connected to a wastewater neutralization system. Locate the eye-wash/shower near the instructional area and prep room, rather than in the back corner of the room, for better accessibility.

Chemistry and Biology laboratories shall also be equipped with teacher-controlled built-in fume hoods (venting separate from building HVAC system) that exhaust directly to outdoors. Do not provide storage below the fume hood for safety reasons. Consider the use of a pass-through fume hood between the prep room and the lab. The fume hood should not interfere with placement of interactive whiteboards or marker boards in the lab.

2 Prep Room
The Prep Room shall be directly accessible from the lab. This is the teacher’s preparation area and should include built-in casework with access to sinks, data and electrical outlets and a full-size refrigerator. Maximize the use of wall space with tall cabinets and wall cabinets for secure storage of equipment and materials and counter space for printers and other peripheral devices. All prep rooms should be equipped with a countertop four gallon locking chemical storage cabinet. Laboratories not directly connected to a prep room should have a countertop four gallon locking chemical storage cabinet in the lab. Where the prep room serves the Chemistry/Biology Labs access to gas shall also be provided.

3 Chemical Storage Room
Provide one Chemical Storage room per school. A separate locking Chemical Storeroom is imperative for safety and should be designed to exhaust complete air exchanges as required by code. This system must be a separate negative pressure system, automatically controlled that exhausts to the outside. The storage room must have 2 doors. Where feasible locate this room where at least one of the doors allows access without disturbing a class. All light switches should be located outside of the Chemical Storeroom door to prevent possible sparking inside the room. Likewise, a smoke detector should be installed in the Chemical Storage Room.

Chemical Storage Rooms should be equipped with flammable, acid/corrosive AND chemical storage cabinets. The size of these cabinets should be determined with input from the science staff regarding the number of Biology and Chemistry laboratories in the school and the number of students taking courses requiring hazardous chemicals. The use of vertical cabinets will help to maximize storage capacity. This room is for the storage of chemicals and is not intended to be used as a prep area so counters should not be provided in this space.

Chemical Storage Room shelving shall either be a pre-manufactured cased unit specifically designed for chemical storage or wall mounted standards and bracket system with wood shelves. All shelving shall be strongly fastened to the wall, a maximum of 12 inches deep, spaced a minimum of 10 inches apart, with a raised lip at each shelf edge, and be at or below eye level (60 inches) for easy access.
4 Staff Collaboration Allowance
The Staff Collaboration space provides a personal workstation/personal storage, kitchenette, collaboration space, and shared storage. A Staff Collaboration allowance is included in the Science Lab section of the Program for Design (PFD). If the number of Science teachers exceeds the number of labs, the Staff Collaboration Allowance for these additional teachers is captured in the Neighborhood calculation and can be redistributed as needed. Grouping of Staff Collaboration spaces is intended and highly desired. Access to staff Collaboration should be through shared spaces such as the Learning Hub or main building circulation. The shared space may be within a Science suite or any other Staff Collaboration grouping.

5 Learning Hub Allowance
A Learning Hub Allowance is included in the Science Lab section of the Program for Design (PFD). This allows the Science Labs to be arranged in their own Neighborhood, or incorporated into the academic Neighborhoods with the same functionality for collaboration and project based learning that is provided in the academic Neighborhoods.

Science Lab Concept Perspective

NOTE: 3D illustrations are shown for informational purposes and are not intended to limit design options.