HIGH SCHOOL SCIENCE LAB PLAN A (WITH CHEMICAL STORAGE IN SECURE CABINETS)

SCIENCE LAB GUIDELINES

NOTES:

1. These diagrams are examples of table arrangements that can accommodate a wide variety of activities, groupings, and instructional configurations that are typical of laboratory work and instruction in small, medium, and whole-class groups. The intent is to design spaces which maximize flexibility for varied uses without extensive reconstruction.

2. The guidelines are to be considered standards; other space and utility configurations may vary from these standards.

3. These diagrams should be used as requirements. The district's, other items are MSBA recommendations are considered best practices.

REQUIREMENTS:

1. The MSBA allotment of 1,440 NSF for each science lab is based on a 60 NSF per student (24 students). Smaller science classrooms may be considered if the class size is smaller, with a minimum of 60 NSF per student.

2. These plans are to be considered standard template configurations; specific school designs may vary from these standards.

3. Sinks should be wide and deep enough to accommodate buckets and other large containers.

4. Optional fume hoods and bio-safety cabinets should be accessible from both the prep room and the classroom.

5. No fixed casework is permitted in the central floor area.

6. Provide visual access between labs and prep rooms; prep rooms should not be walled in.

7. Sink clearances can be reduced to 36", with hard lines run located elsewhere as needed.

8. These diagrams should be used as requirements. The design team should provide for a science lab layout that allows for flexibility and universal access.

9. No lab raised utilities, that may restrict flexibility, are to be provided in the central floor area of the science lab. Suspended utilities from the ceiling may be needed for some disciplines, but only if the peripheral utilities cannot accommodate most needs.

10. For those projects in which the design team has determined that a single exit access door is from each science lab, comply with the requirements for egress as stated in the 10.1.11. Massachusetts State Building Code. The designer shall provide, in addition to the required exit access door, a communicating opening door from the lab to the laboratory area. Up to four adjacent classrooms or accessible spaces (library, media center, resource center, etc.) can be connected by means of egress and exit stair. This second door should be separated as far from the exit access door as practical, as determined by the design team. Doors used for access to storage rooms, prep rooms, or other spaces that are not typically accessible by students will not be considered to meet this requirement. The requirement for this second door is in addition to, does not supersede, and the design must not conflict with the minimum requirements of 780 CMR, which are the responsibility of the design team.

BEST PRACTICES:

1. Sturdy, standing-height two-student tables should match the height of peripheral counter tops so that students perform lab work standing (preferred) and sit work on stools. Two-student tables (not larger) are recommended so they can be moved into a variety of configurations. An option for 34" tall case work and tables for overall accessibility is also available. Adjustable-height tables are not recommended.

2. Lab and lecture systems must be accommodated in science labs and room. Individual work stations are not permitted.

3. Safety showers and eyewash stations are required in all science labs.

4. It is required that all design teams provide for a science lab layout that allows for flexibility and universal access.

5. The intent is to design spaces which maximize flexibility for varied uses without extensive reconstruction.

6. Safety equipment and information such as fire blankets, sterile eye protection, and material safety data sheets (MSDS) should be located in high-visible and easily accessible places, preferably near exits and other required safety equipment.
1. STURDY, STANDING-HEIGHT TWO-STUDENT TABLES SHOULD MATCH THE HEIGHT OF PERIPHERAL COUNTERTOPS SO THAT STUDENTS PERFORM LAB WORK STANDING (PREFERABLE) AND "SEAT WORK" ON STOOLS. TWO-STUDENT TABLES (NOT LARGER) ARE RECOMMENDED SO THEY CAN BE MOVED.

2. THE DISTRICT AND DESIGN TEAM SHOULD PROVIDE FOR A SCIENCE LAB LAYOUT THAT ALLOWS AS MUCH FLEXIBILITY AND UNIVERSALITY AS PRACTICAL, GIVEN THE DISTRICT'S SCIENCE DEPARTMENT EDUCATIONAL PLAN.

3. BOTH LAB AND LECTURE CONFIGURATIONS MUST BE ACCOMMODATED WITHIN DESIGNATED SCIENCE LAB ROOMS. BICOVERABLE LECTURE ROOMS ARE NOT PERMITTED.

4. OPTIONAL FUME HOODS AND BIO-SAFETY CABINETS SHOULD BE ACCESSIBLE FROM BOTH THE PREP ROOM AND THE CLASSROOM. THE REQUIREMENT FOR THIS SECOND DOOR IS IN ADDITION TO, DOES NOT SUPERSEDE, AND THE DESIGN MUST NOT CONFLICT WITH, THE MINIMUM REQUIREMENTS OF 780 CMR, WHICH ARE THE RESPONSIBILITY OF THE DESIGN TEAM.

5. NO FIXED CASEWORK IS PERMITTED IN THE CENTRAL FLOOR AREA.

6. FOR THOSE PROJECTS IN WHICH THE DESIGN TEAM HAS DETERMINED THAT A SINGLE EXIT ACCESS DOORWAY FROM EACH SCIENCE LAB COMPLIES WITH THE REQUIREMENTS FOR EDGES AS STATED IN THE ONE CHAPTER 10 MASSACHUSETTS STATE BUILDING CODE, THE DESIGNER SHALL PROVIDE, IN ADDITION TO THE REQUIRED EXIT ACCESS DOORWAY, A COMMUNICATION DEVICE FOR THE SCIENCE LAB AND A DETECTION DEVICE, UNTIL TWO THROUGH ADJACENT CLASSROOMS OR ACCESSIBLE SPACES THROUGH PROPER ACCESS MEANS TO ENTER AND EXIT EACH LAB. THIS SECOND DOOR SHALL BE SEPARATED AS FAR FROM THE EXIT ACCESS DOORWAY AS PRACTICAL, AS DETERMINED BY THE DESIGN TEAM. DOORS USED FOR ACCESS TO STORAGE ROOMS, PREP ROOMS OR OTHER SPACES LOCKED OR OTHERWISE NOT TYPICALLY ACCESSED BY STUDENTS WILL NOT BE CONSIDERED TO MEET THIS REQUIREMENT. THE REQUIREMENT FOR THIS SECOND DOOR IS IN ADDITION TO, DOES NOT SUPERSEDE, AND THE DESIGN MUST NOT CONFLICT WITH, THE MINIMUM REQUIREMENTS OF 780 CMR, WHICH ARE THE RESPONSIBILITY OF THE DESIGN TEAM.

7. EACH LAB PREP ROOM SHOULD INCLUDE ONE REFRIGERATOR AND ONE DISHWASHER.

8. PROVIDE VISUAL ACCESS BETWEEN LABS AND PREP ROOM / PREP ROOM DOORS.

9. SHARED SPACES CAN BE REDUCED IN AREA, WITH SAVED AREAS REALLOCATED ELSEWHERE AS NEEDED.

10. PREP ROOMS AND CHEMICAL STORAGE SHOULD BE KEYED IN SUCH A WAY TO PROVIDE LIMITED ACCESS, FOR REQUIRED PERSONNEL ONLY.

11. AT THE DISTRICT'S DISCRETION, CHEMICAL STORAGE CAN BE DIVIDED INTO SATELLITE STORAGE ROOMS, BUT CHEMICAL STORAGE IN PREP ROOM IS DISCOURAGED.

12. SAFETY EQUIPMENT AND INFORMATION SUCH AS FIRE BLANKETS, STERILE EYE-PROTECTION, AND MATERIAL SAFETY DATA SHEETS (MSDS) SHOULD BE LOCATED IN HIGHLY-VISIBLE AND EASILY ACCESSED PLACES, PREFERABLY NEAR EXITS AND OTHER REQUIRED SAFETY EQUIPMENT.

13. RATHER THAN GREEN HOUSES, CONSIDER DESIGNS THAT ALLOW PLANTS TO BE PLACED ON SHELVES OR MOVEABLE RACKS WITH ACCESS TO LIGHT FROM CLASSROOM WINDOWS.
SCIENCE LAB GUIDELINES

NOTES:
1. THESE DIAGRAMS ARE EXAMPLES OF TABLE ARRANGEMENTS THAT CAN ACCOMMODATE A WIDE VARIETY OF ACTIVITIES, GROUPINGS, AND INSTRUCTIONAL CONFIGURATIONS THAT ARE TYPICAL OF LABORATORY WORK AND INSTRUCTION IN SMALL, MEDIUM, AND WHOLE-CLASS GROUPS. THE INTENT IS TO DESIGN SPACES WITH MAXIMUM FLEXIBILITY FOR VARIOUS-AGE WITHOUT EXTENSIVE RECONSTRUCTION.
2. THESE PLANS ARE TO BE CONSIDERED STANDARDS, THEY MAY NOT APPLICABLE IN EACH SITUATION, AND THEIR APPLICATION MAY VARY FROM THESE STANDARDS.
3. THE ITEMS DESCRIBED BELOW AS REQUIREMENTS: FIRE SAFETY AND OTHER ITEMS ARE NOT REQUIREMENTS ARE CONSIDERED BEST PRACTICES.

REQUIREMENTS:
1. THE MINIMUM ALLOCATION OF 1,440 SF FOR EACH SCIENCE LAB IS BASED ON 60 NSF PER STUDENT (24 STUDENTS). SMALLER SCIENCE CLASSROOMS MAY BE CONSIDERED IF THE CLASS SIZE IS SMALLER, WITH A MINIMUM OF 60 NSF PER STUDENT.
2. THE DISTRICT AND DESIGN TEAM SHOULD PROVIDE FOR A SCIENCE LAB LAYOUT THAT ALLOWS AS MUCH FLEXIBILITY AND UNIVERSALITY AS PRACTICAL, GIVEN THE DISTRICT'S SCIENCE DEPARTMENT EDUCATIONAL PLAN.
3. BOTH LAB AND LECTURE CONFIGURATIONS MUST BE ACCOMMODATED IN EVERY DESIGNATED SCIENCE LAB ROOM. SEPARATE LABS AND LECTURE ROOMS ARE NOT PERMITTED.
4. NO LAB RAISED UTILITIES, THAT MAY RESTRICT FLEXIBILITY, ARE TO BE PROVIDED IN THE CENTRAL FLOOR AREA. SUSPENDED FROM THE CEILING MAY BE NEEDED FOR SOME DISCIPLINES, BUT ONLY IF THE PERIPHERAL UTILITIES CANNOT ACCOMMODATE THE MOST NEEDS.
5. NO FIXED CASEWORK IS PERMITTED IN THE CENTRAL FLOOR AREA.
6. FOR THOSE PROJECTS IN WHICH THE DESIGN TEAM HAS DETERMINED THAT A SINGLE EXIT ACCESS DOORWAY FROM EACH SCIENCE LAB COMPLIES WITH THE REQUIREMENTS FOR EGRESS AS STATED IN THE ONE CHAPTER 10 MASSACHUSETTS STATE BUILDING CODE, THE DESIGNER SHALL PROVIDE, IN ADDITION TO THE REQUIRED EXIT ACCESS DOORWAY, A COMMERCIAL ROLLING DOORWAY OR OTHER EGRESS ACCESS FROM EACH LAB AS DETERMINED, OR TO OTHER ADJACENT CLASSROOMS OR ACCESSIBLE SPACES. WHETHER PROVIDING ACCESS MEANS TO EGRESS AND EXIT EACH LAB. THIS SECOND DOOR SHOULD BE SEPARATED AS FAR FROM THE EXIT ACCESS DOORWAY AS PRACTICAL, AS DETERMINED BY THE DESIGN TEAM. DOORS USED FOR ACCESS TO STORAGE ROOMS, PREP ROOMS OR OTHER SPACES LOCKED OR OTHERWISE NOT TYPICALLY ACCESSED BY STUDENTS WILL NOT BE CONSIDERED TO MEET THIS REQUIREMENT. THE REQUIREMENT FOR THIS SECOND DOOR IS IN ADDITION TO, DOES NOT SUPERSEDE, AND THE DESIGN MUST NOT CONFLICT WITH, THE MINIMUM REQUIREMENTS OF TM CMR, WHICH ARE THE RESPONSIBILITY OF THE DESIGN TEAM.
7. PROVIDE FULL BLACK-OUT WINDOW TREATMENTS IN LABS.
8. NO FIXED CASEWORK IS PERMITTED IN THE CENTRAL FLOOR AREA.
9. PROVIDE MOVABLE TEACHER DEMONSTRATION TABLES (NOT FIXED).
10. PROVIDE FULL BLACK-OUT WINDOW TREATMENTS IN LABS.
11. PROVIDE FULL BLACK-OUT WINDOW TREATMENTS IN LABS.
12. PROVIDE MOVABLE TEACHER DEMONSTRATION TABLES (NOT FIXED).
13. PROVIDE MOVABLE TEACHER DEMONSTRATION TABLES (NOT FIXED).
14. PROVIDE MOVABLE TEACHER DEMONSTRATION TABLES (NOT FIXED).

BEST PRACTICES:
1. PROVIDE INSTALLATION HEIGHT TWO-STUDENT TABLES SHOULD MATCH THE HEIGHT OF PERIPHERAL COUNTERTOPS SO THAT STUDENTS PERFORM LAB WORK STANDING (PREFERABLY) AND "SEAT WORK" ON STOOLS. TWO-STUDENT TABLES (NOT LARGER) ARE RECOMMENDED SO THEY CAN BE MOVED INTO A VARIETY OF CONFIGURATIONS. AN OPTION FOR 34" TALL CASEWORK AND TABLES FOR OVERALL ACCESSIBILITY IS ALSO AVAILABLE. ADJUSTABLE-HEIGHT TABLES ARE NOT RECOMMENDED.
2. PROVIDE INSTALLATION HEIGHT TWO-STUDENT TABLES SHOULD MATCH THE HEIGHT OF PERIPHERAL COUNTERTOPS SO THAT STUDENTS PERFORM LAB WORK STANDING (PREFERABLY) AND "SEAT WORK" ON STOOLS. TWO-STUDENT TABLES (NOT LARGER) ARE RECOMMENDED SO THEY CAN BE MOVED INTO A VARIETY OF CONFIGURATIONS. AN OPTION FOR 34" TALL CASEWORK AND TABLES FOR OVERALL ACCESSIBILITY IS ALSO AVAILABLE. ADJUSTABLE-HEIGHT TABLES ARE NOT RECOMMENDED.
3. PROVIDE INSTALLATION HEIGHT TWO-STUDENT TABLES SHOULD MATCH THE HEIGHT OF PERIPHERAL COUNTERTOPS SO THAT STUDENTS PERFORM LAB WORK STANDING (PREFERABLY) AND "SEAT WORK" ON STOOLS. TWO-STUDENT TABLES (NOT LARGER) ARE RECOMMENDED SO THEY CAN BE MOVED INTO A VARIETY OF CONFIGURATIONS. AN OPTION FOR 34" TALL CASEWORK AND TABLES FOR OVERALL ACCESSIBILITY IS ALSO AVAILABLE. ADJUSTABLE-HEIGHT TABLES ARE NOT RECOMMENDED.

HIGH SCHOOL SCIENCE LAB PLAN C (WITH SEPARATE CHEMICAL STORAGE ROOM)

MID-SIZED GROUP / ROBOTICS CONFIGURATION

MID-SIZED GROUP / ROBOTICS CONFIGURATION 2

SCIENCE SINKS INCLUDE H&C WATER, DRAINAGE, ELECTRICITY, AND GAS (OPTIONAL AIR OR VACUUM)

SAFETY GOGGLE

STERILIZER UNIT

INSTRUCTOR'S TEACHING WALL

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