2. Composite Skill Lab

2.1. Skill Education Components

Effective implementation of skill education for all students from classes VI to X will require the following components to be in place.

- Curriculum – The curriculum will be provided by CBSE in alignment with the curriculum/textbook provided by NCERT.
- Teacher Training & Staffing - Teachers need to be identified and/or hired specifically for imparting skill education. These teachers will be trained on pedagogy of skill education, curriculum, practical and technical aspects.
- Time Table - Schools needs to incorporate 110 hrs of Skill Education annually in their time table for classes VI to X.
- Composite Skill Lab (CSL) - The guidelines for the setting up of the Composite Skill Lab is covered in subsequent chapters in this guide.
- Industry Partnership - Skill coordinators of respective schools will facilitate work-place exposure initiatives such as industry visits relevant to the skill subject, guest expert sessions in schools and internships, etc.

2.2. About Composite Skill Lab and Expenditure on setting up of CSL

Composite Skill Lab allows a school to efficiently use one lab to teach multiple sectors across classes.

The setting up of the CSL may cost about Rs. 3-6 lakhs depending on the skill subjects chosen, size of lab and type of furniture, etc. Schools may need more quantities of tools depending on the number of students in classes VI to X. This costing is only suggestive, and schools may want to invest more in branded equipment or more specialised equipment/furniture, etc.

2.3. Alignment with NEP 2020 & NCF 2023

The concept of Composite Skills Labs aligns with both the National Education Policy (NEP) 2020 and the National Curriculum Framework (NCF) 2023, fostering practical learning, creativity, and employability.

- **Hands-on exposure to multiple sectors**: Availability of one single lab to give exposure to students to multiple sectors, skills and careers and allow them to see cross-sector applications.
- **Theory in Action**: Labs bridge classroom knowledge with real life applications through hands-on activities and projects making students more employable and career ready.
- **Interdisciplinary Learning**: Facilitates cross-sector projects like Agri-tech, sustainable fashion, entrepreneurship through the combination of digital, financial and technical skills, to promote holistic learning and employability.
- **21st Century Skill Development**: Fosters critical thinking, communication, collaboration and problem-solving, equipping students with essential 21st century skills as emphasized in NEP 2020.

- **Inclusivity & Accessibility**: Designed to promote equitable participation, ensuring all students gain practical skills and thrive in supportive environments, as outlined in NEP 2020.
- **Technology Integration**: Emphasizes the inevitable inclusion of technology in all sectors and use of videos, apps to aid teaching and learning through a multimedia approach.

2.4. Setting up a Composite Skill Lab

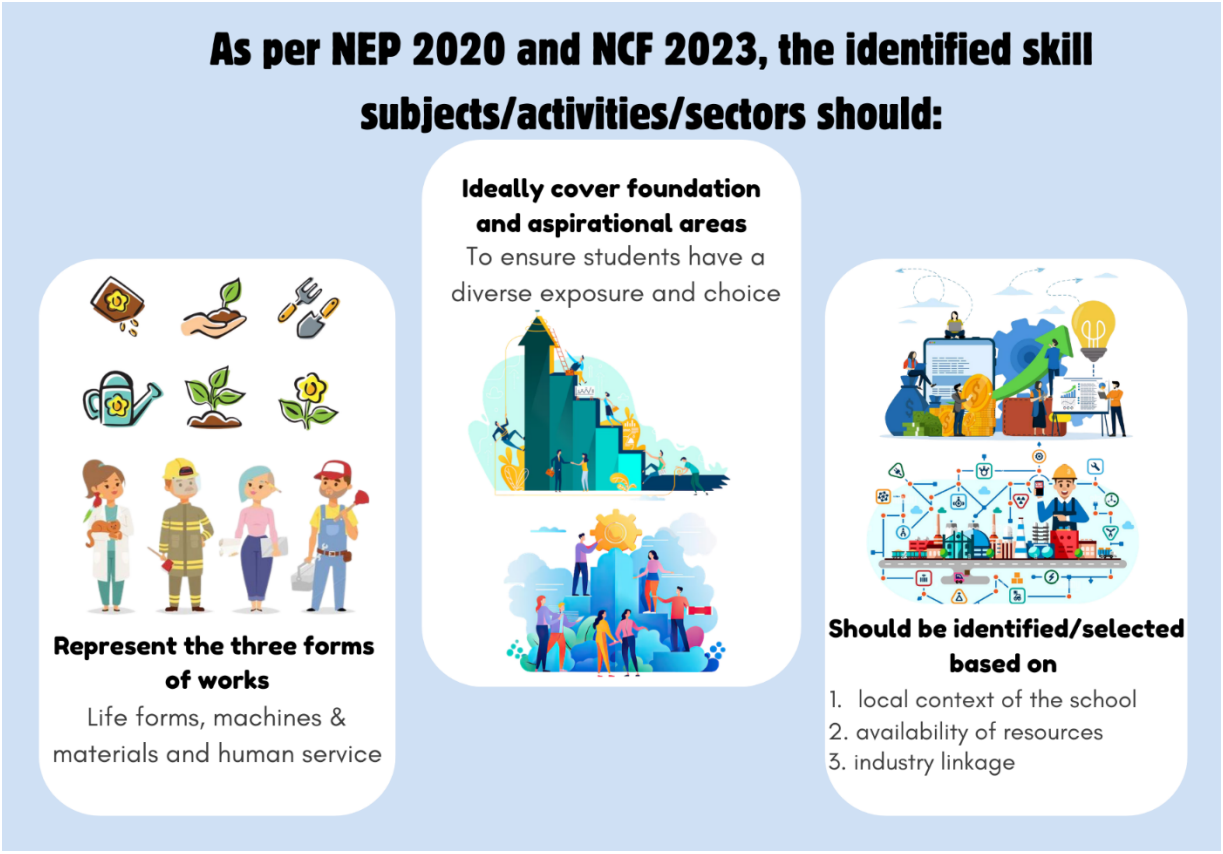
1. Identification	•Space & Sector Identification
2. Infrastructure Readiness	•Developing Infrastructure
3. Finalise the lab design	•Fixing the layout of the room based on its dimension
4. Tools and furniture	•Installation of the requisite tools-equipment & furniture for selected sectors
5. Ensuring Safety	•Enable all safety measures and put up directions and signs

1: Identifying the skill subjects and activities relevant to the local context, aspirations, industry and resources in and around the school

- It is recommended that the Composite Skill Lab should be able to provide skill education in six skill subjects over two years as recommended by NCF-SE 2023
- These skill subjects should cover all three forms of 'work' (Life forms, Machines & Material and Human Services)
- Principles for choosing skill subjects/activities:
  - Understanding the local context of the school and the relevant skill subjects/activities
  - Mapping the availability of resources for teaching the skill subjects - tools, equipment and raw material, teacher qualification, etc.
  - Access to local business for work-place exposure - field visits, guest experts from business/Industries to teach specific skills and also about availability of work or academic avenues for the specific skill subjects.

2: Identify a room that fits the following pre-requisites

- One room of minimum 600 sq. ft space for class VI-XII or two rooms of minimum 400 sq. ft space, one for classes VI-X & one for classes XI-XII (as per Circular No. Skill-75/2024).
- The room/s should have enough space for conducting requisite practical work with safety and ease for the batch of 25 – 40 students.
- Room/s should be properly ventilated with windows and exhaust fans.
- Room/s should have at least two clear walls for peg boards & poster displays.
- Room/s should have proper electrical wiring, lights and fans.
- Room/s should have access to water and proper drainage of water from sink (if required).
- Room/s should preferably be close to an open area where some activities such as gardening can be done.

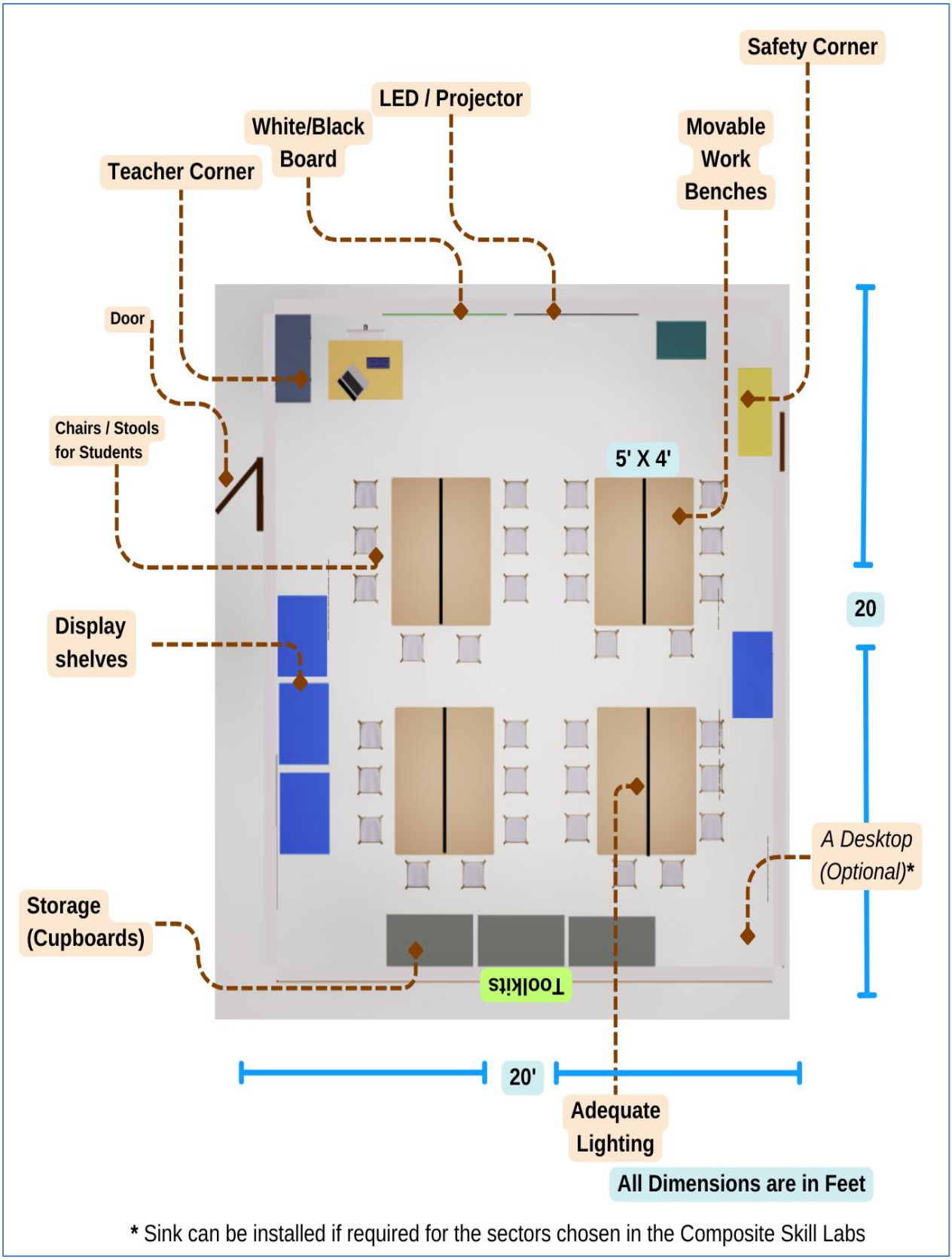


Identification of Skill subjects/sectors/activities, for setting up Composite Skill Lab

3: Fix the layout of the room based on its exact dimensions and available spaces

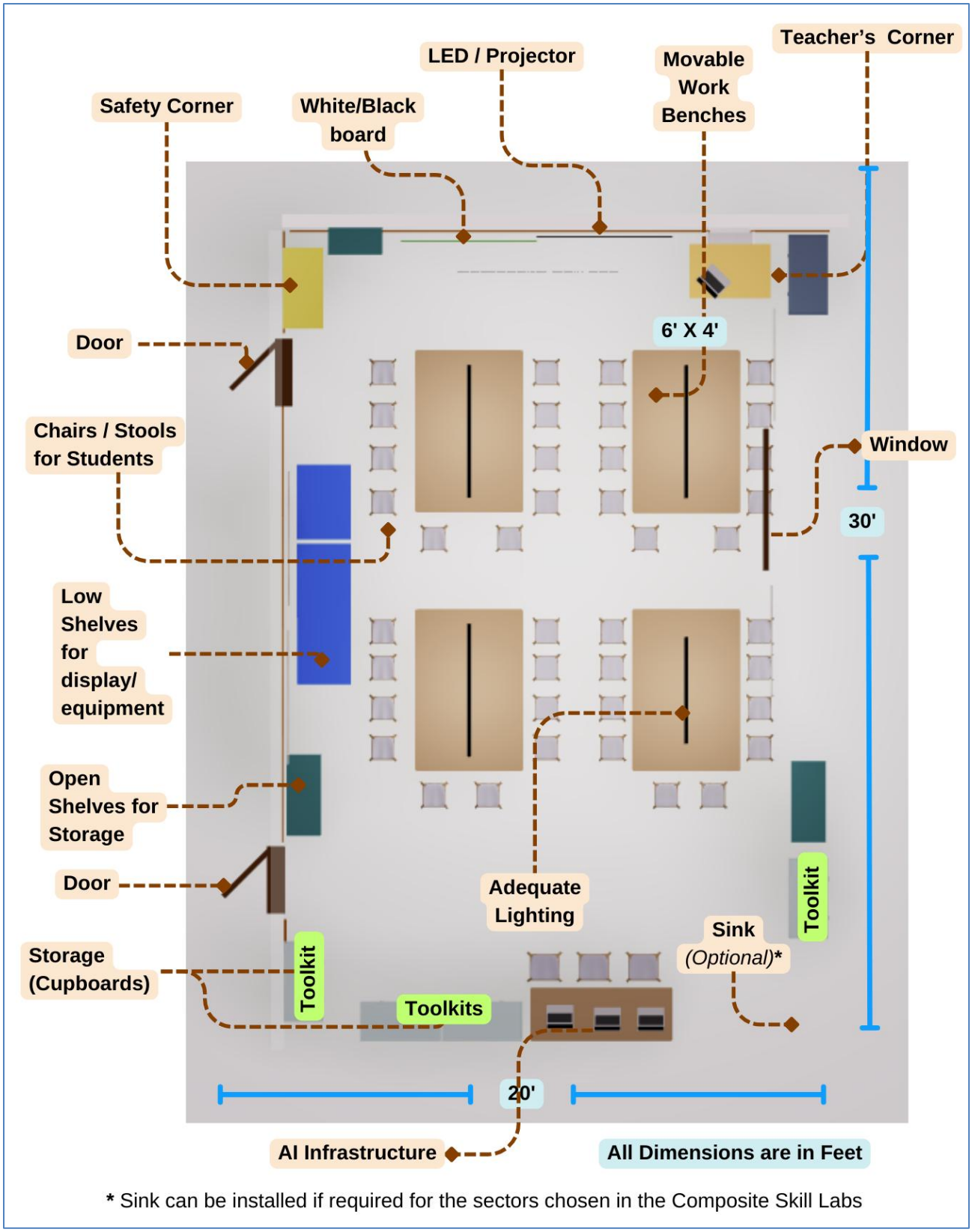
- It is recommended that the Composite Skill Lab be made modular to create flexibility in both the use of workstations and in the choice of skill subjects that the school chooses to offer.
- Schools will pick skill subjects that are relevant to its local context and aspirations of the students and management. These choices may change over time and the modular structure with toolkit-approach will help the lab remain relevant & dynamic.
- Lab spaces can be reconfigured to adapt to emerging demands of skills or emerging technologies.

Some illustrative/ model/ sample layout plans for Composite Skill Lab are also being shared for reference.



Model layout plan- 1 for a Composite Skill Lab (400 sq. ft)

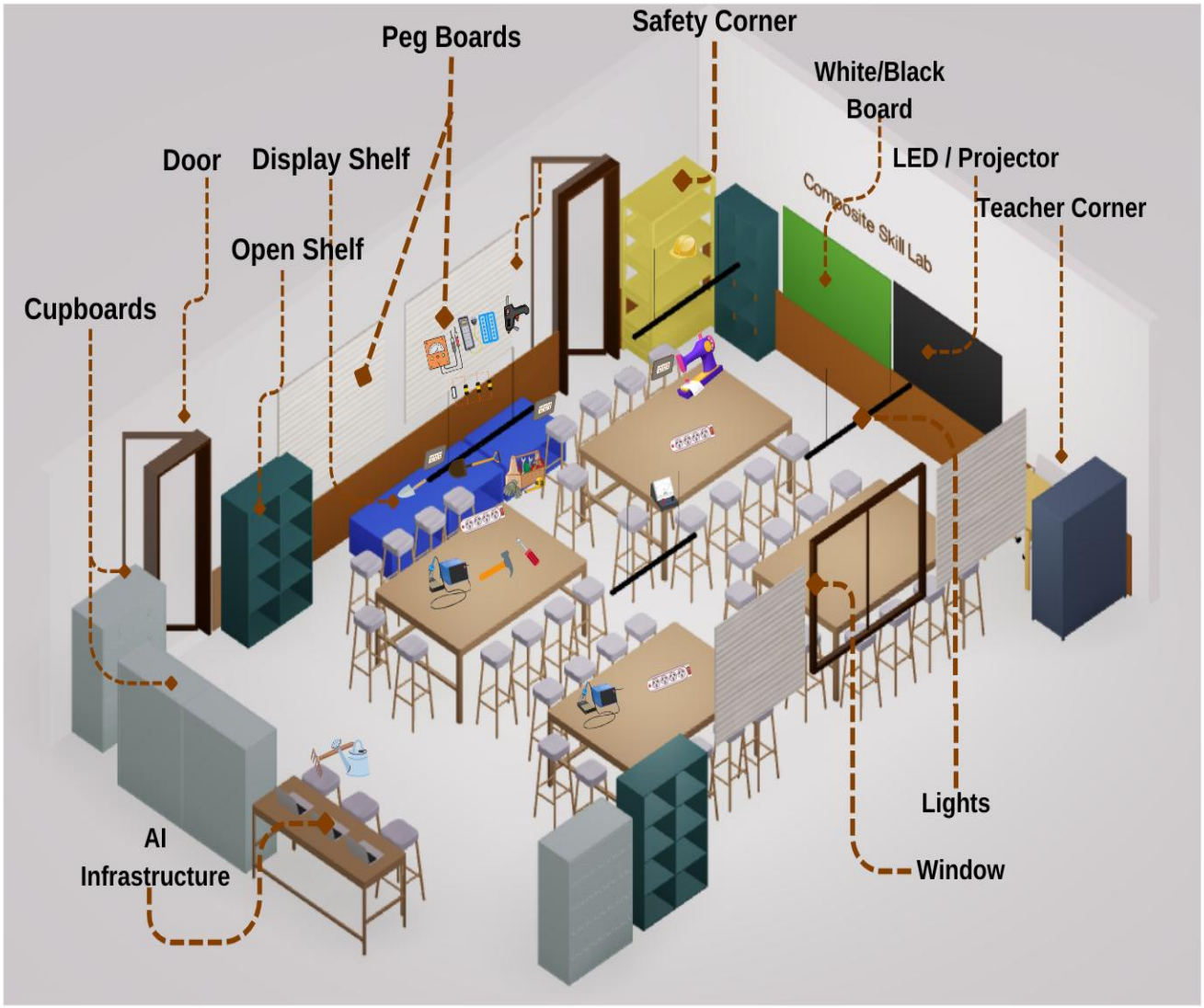
Model layout plan- 2 for a Composite Skill Lab (400 sq. ft)



Model layout plan- 1 for a Composite Skill Lab (600 sq. ft)

Model layout plan- 2 for a Composite Skill Lab (600 sq. ft)

Illustrative Model for Composite Skill Lab
View 1 - From the back of the Classroom



Illustrative Model for Composite Skill Lab
View 2 - From the door of the Classroom

Sample Lab Designs

4: Installation of tools-equipment and furniture to complete the lab design

Based on the skill subjects chosen, room-size and layout, the infrastructure is to be provided/procured:

A. Flooring of Composite Skill Lab:

a. **Material**: Preferably use concrete flooring or rubber mats to withstand vibrations and heavy loads.
b. **Durability**: Avoid vitrified tiles or stone flooring as they may not endure prolonged use with heavy tools.
c. **Versatility**: Flooring should be adaptable to the needs of different skill subjects.

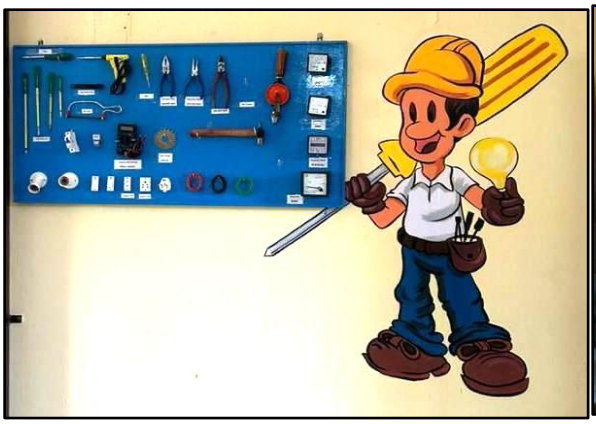
B. Civil Work:

a. **Ventilation**: Ensure the lab has windows or vents for proper airflow.
b. **Electrical Wiring**: Install a combination of 15-ampere and 5-ampere switches and sockets preferably on all walls for operating machines and tools.
c. **Proper Lighting and Fans**: Ensure that the room has adequate lights and fans to work comfortably and with precision.
d. **Sink Area**: Provide a sink with a water tap and drainage outlet, if you have selected skill subjects that require flowing water on regular basis for conducting activities/ practical. This is optional for other schools.

C. Walls and Colouring

a. **Base Paint**: Walls may be painted white or in light shades for a clean and bright look.
b. **Accent Colours**: Use tiles or contrasting paint up to 3 feet above the floor for durability and visual appeal.
c. **Murals**: Encourage schools to paint murals or skilling visuals on walls to enhance the learning environment. Bright & warm colours will make the room inviting to students.
d. The lab should provide a positive & fun filled learning environment for the students.

Examples of Speaking Walls:



D. Furniture for Composite Skill Lab

a) Working Tables

Working tables form the backbone of the Composite Skill Lab. The following considerations are important:

- Working area should enable working in small groups.
- It should have strong, safe and reliable working platforms so as to have durability and
- easy maintenance and ensure long-term usability in practical environments.
- If needed, heavy tools should be mounted for ease of use and to avoid accidents.
- The tables should have a sturdy wooden top to withstand wear and tear from tools and materials.
- Some tools may also be needed to be fitted on the top of the tables for effective use.
- The tables should be appropriately sized to accommodate small groups of students working collaboratively. Depending on the size of the room, tables can be 5ft x 4ft or 6ft x 4ft.
- Ensure that the edges of the tables are smooth and rounded to avoid injuries.

Work Tables

b) Teacher Table: Provide a table and chair for the use of the teacher/trainer

Teacher's Table

c) Storage

- Since the lab would have tools and equipment for a variety of skill subjects, it is important that they are stored safely, as well as accessible easily. Use large-sized cupboards with adjustable shelves ensuring adaptability to various tools and materials and optimizing space usage
- Types of Storage: Use a mix of cupboards, shelves, and racks to cater to different storage needs. Consider mobile storage units for flexibility.
- Labelling: Clearly label all storage units and their contents to facilitate easy access and inventory management, can consider using pictures of contents as labels.
- It is also important that tools are not only accessible but readily visible during the practical work. Hence lower display shelves, peg boards can be used

i. Tools Storage – Cupboards and Open Cupboards

a. **Size**: Use large-sized cupboards with adjustable shelves to adapt to different storage needs. Shelves should be capable of holding heavy tools and equipment securely. A typical cupboard could be 6.5ft x 3ft x 2ft
b. **Design**: Include transparent or labelled doors for easy identification of contents
c. **Positioning:** Cupboards should be positioned along the walls to optimize floor space. Ensure they are accessible but not obstructive. Proper placement avoids workspace congestion and maintains a neat environment

ii. Containers

a. **Label containers** - Store materials in labelled containers within the cupboards to enhance organization
b. **Stackable containers** - Maximize space utilization by using stackable containers. Organized containers prevent mix-ups and ensure efficient use of cupboard space

Illustrative storage box

Tools/toolkits placed inside the box

iii. Storage unit for teachers - Provide a small cupboard to store stationery, students' handbooks, and other teaching materials for the teachers.

Illustration storage rack for teachers

d) Display

Proper display of tools foster pride in students' work and encourage peer learning and inspire innovation and healthy competition.

e) Shelves

Use tall, adjustable racks or low shelves depending on the space available to store large equipment or display students work. The lab will be used by students from classes VI to X and therefore, a mix of heights can serve all students.

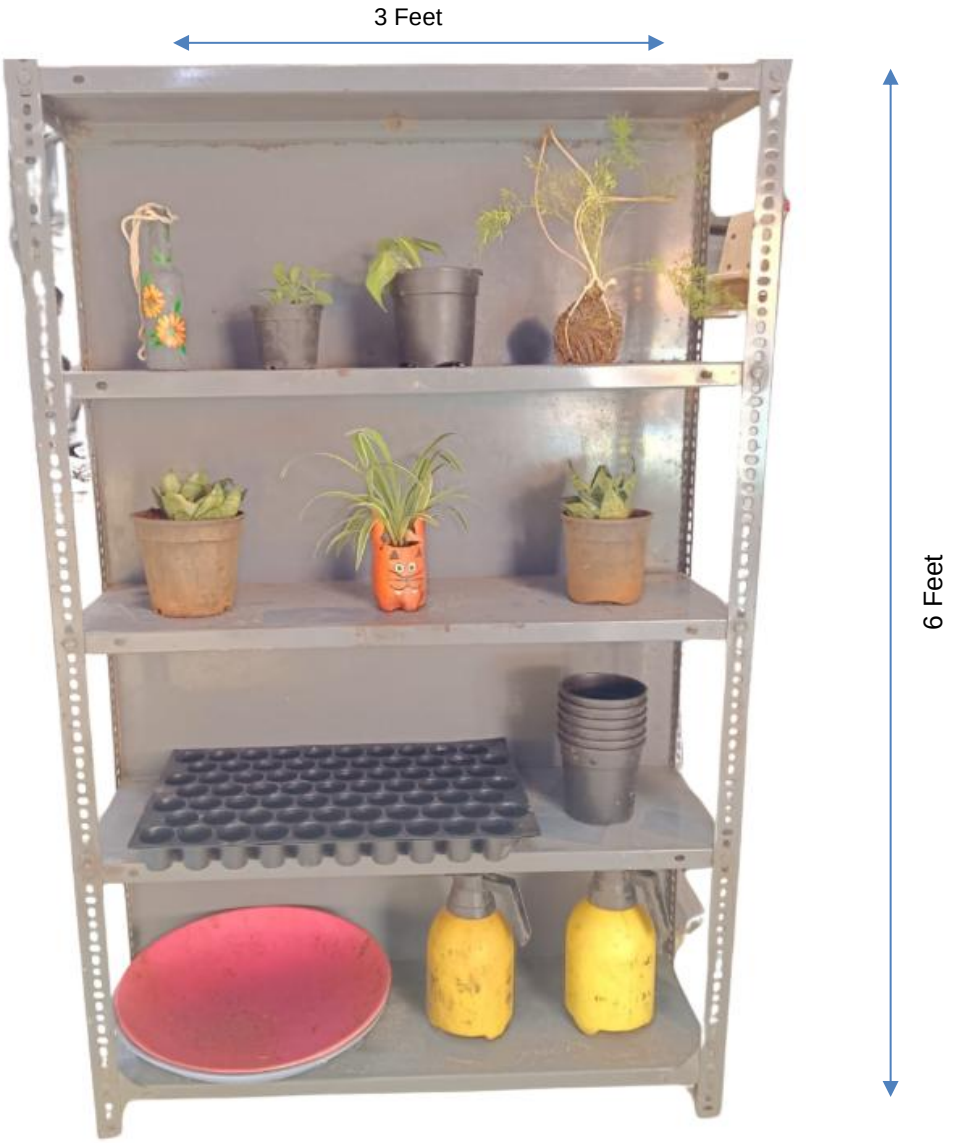
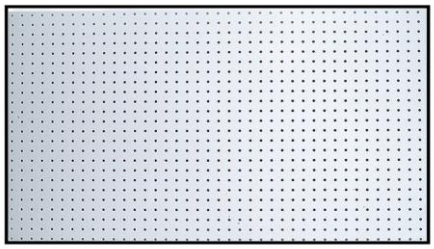


Illustration Tall Storage Rack

f) Pegboard

- Pegboards may be provided for displaying tools so that students learn visually and remember over time.
- **Tool Display**: Install peg boards on walls to hang tools in an organized and visually appealing manner.
- **Learning Aid**: Displaying tools on pegboards helps students familiarize themselves with tool names and functions.
- **Customization**: Arrange tools by category or usage to streamline learning and retrieval.



Pegboard without tools

Pegboard with tools

Illustrative Pegboard

g) Projection

- **Equipment**: Install an LED screen or projector for presentations, tutorials, and demonstrations. Choose a device with high resolution and compatibility with multiple input formats.
- **Placement**: Position the equipment to ensure visibility for all students. Use a retractable screen or wall-mounted display for efficient use of space.

- **Connectivity**: Provide HDMI, USB, and wireless connectivity for seamless integration with laptops and other devices.
- **Maintenance**: Ensure regular cleaning and servicing of the projector or screen to ensure optimal performance. Keep spare bulbs or parts readily available.
- **Internet Connectivity**: Internet connectivity may be provided to enable online interaction with mentors.

5: Ensure safety protocols are well laid-out and practised

- Safety of the students and teachers is of paramount importance. Therefore, the Composite Skill Lab should be designed considering all safety protocols.
- The Lab should have a dedicated safety corner as well as have safety provisions embedded in installation.
- See Chapter 4 for safety guidelines, roles and expectations, equipment and some sample posters/illustrations.

Specification of Key elements of setting up of CSL

***** *These are suggested specifications based on the lab size of 30 Feet X 20 Feet and the model layout. These sizes can be adjusted based on the actual space available.*

S. No.	Element	Description	Specifications*
1	Digital Displays or Smartboards	Used for presentations, videos, multi-media teaching-learning material	LED TV/Screen & Projector
2	Inspirational Quotes/Goals Wall	Features motivational quotes or learning goals (e.g., "Learn by Doing").	-
3	Labelling Zones with Wall Decals/Paint	Labels with fun fonts or icons (e.g., “First Aid Station”) to visually organize areas.	-
4	Safety Rack	Easy access to all safety equipment including helmets, gloves, PPE kits, shoes/slippers.	Iron rack with 3 adjustable shelves. Dimension: 48” x 48” x 18”. Fire extinguisher & 2 sand buckets to be hooked on wall
5	Sink with platform	Sink with drainage area to reduce spillage, proper drainage system & installation of sink	Sink with drainage area 37” x 18” x 8” fitted into a platform 4ft x 3ft
6	Stools for sitting	Flexible seating that does not take up too much space and can be stacked up when standing is required.	12” x 12” x 20” (square top) or 12” diameter (round top). Top: Perforated sheet with gauge, Steel Frame: 20 mm x 20 mm x 18 Gauge square tube with powder coating in grey paint, bottom should be rubber leveller (Nylon)
7	Teacher’s cupboard	Small filing cabinet/cupboard for books, stationery and other items for teacher’s use.	Steel/Metal cupboard with 3 adjustable shelves with lock and key facility, 20 Gauge with dimension 48"x 36"x18"
8	Teacher’s desk and chair	For the teacher to sit	Wooden table 3ft x 2ft

9	Tool Pegboards	Wall-mounted perforated boards with hooks and labelled sections for organizing smaller tools like scissors, cutters, and hammers.	4ft*3ft plywood of 18mm thickness with boundary and cloth in contrasting colour in the background. Waterproof ISI Mark plywood
10	Wall Storage Cupboards	Cupboards (with glass/steel door) to store toolkits by skill subjects	Steel/Metal cupboard with 4 adjustable shelves with lock and key facility, 20 Gauge with dimension 78"x 36"x24"
11	Wall Storage Shelves	Low open shelves to place large equipment and display students' work	Wooden shelves along the wall edge. Length as per available wall. 2ft (H) x 2ft (D)
12	Whiteboards/ Chalkboards	Used for writing daily instructions, schedules, or tasks.	As per available size of wall
13	Working tables	To perform practical in groups. Allows for collaboration and group work. Large table allows for different kinds of activities from designing in fashion to making mechatronics projects	Steel Frame with gauge 2'x2" sq. pipe Length: 6/8ft, Breadth: 4ft and Height: 30 Inch (2.5 ft) Top: 18 mm commercial ply with lamination/powder coating, bottom should have rubber leveller