

# Designing a modern science teaching laboratory – an interdisciplinary approach

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## What is Integrated Science (iSci)?

- A 4-year, interdisciplinary, research-based program.
- Students develop self-directed learning skills in a supportive and collaborative setting.
- Wide variety of topics discovered through project-based exploration.

## Current Challenges of an Interdisciplinary Lab Setting

- Multiple labs from life science, physics, earth science, and chemistry.
- Labs need to be innovative but still complement lecture material.
- Need for equipment storage is much greater.

## Pedagogical Considerations

- Classrooms are not the only form of learning space - majority of student learning activity takes place outside the classroom.<sup>1</sup>
- Students increasingly are motivated by social interaction with their peers.<sup>1</sup>
- The laboratory is especially important in the current era in which inquiry has re-emerged as a central style advocated for science teaching and learning.<sup>2</sup>
- Research consistently supports hands-on lab experience as one of the best ways to positively influence students' attitudes toward science.<sup>3</sup>



## Design Features

### An exciting and innovative design

- Open-concept layout, vibrant colour scheme, and natural lighting create an inviting atmosphere.
- Includes multi-function equipment, furniture, and utilities suited to meet evolving needs of the program.
- Provides a positive environment to stimulate student creativity through inquiry-based experimentation.
- Studies have shown "excitement" has a great impact on students' attitudes toward labs.<sup>3</sup>

### Equipment for effective learning

- Studies have shown students perceive learning as a benefit for the cost of their time spent in the lab.<sup>3</sup>
- Better equipment, including fume hoods, allows for effective learning of core concepts.
- Efficient lab time reduces student stress to complete tasks while permitting time for exploration and creativity.

### Media Presentation System

- Rapidly evolving technologies have created students who demand instantaneous feedback and involvement.<sup>4</sup>
- Interactive display and whiteboard capture system supports group interaction.
- Real-time interactions (e.g. videoconferencing) made possible through streaming technologies.
- Permits lecture-style material to be presented in a lab setting.

### Student-friendly lab benches

- Designed to permit activities which engage students individually or in small groups.
- Allows project-based inquiry activities across disciplines.
- Increases social interaction – students assisting students creates a collaborative learning environment.

