

3 Space Descriptions

Science Curriculum - High School

Science

Philosophy

The Science Department provides students the opportunity to study the four core domains of science: Earth Science, Biology, Chemistry, and Physics. Each course is divided into instructional segments centered on questions about observations of specific phenomena. Through this inquiry-based approach, students engage with the content while applying literacy and math skills to explore scientific readings and investigations. Courses are offered in a sequence that supports college and career readiness. Upperclassmen are encouraged to continue exploring science through elective courses. Advanced courses are available for students seeking deeper understanding in core subject areas.

Objectives

The Science Department will collaborate as a Professional Learning Community to deliver curriculum that builds on critical thinking and processing skills developed in earlier grades. All students begin with a freshman biology course that integrates relevant Earth and space science concepts. Subsequent years offer opportunities to study Chemistry and Physics, also integrating Earth and space science concepts. Upperclassmen may enroll in advanced courses in Chemistry, Physics, and Biology, as well as electives.

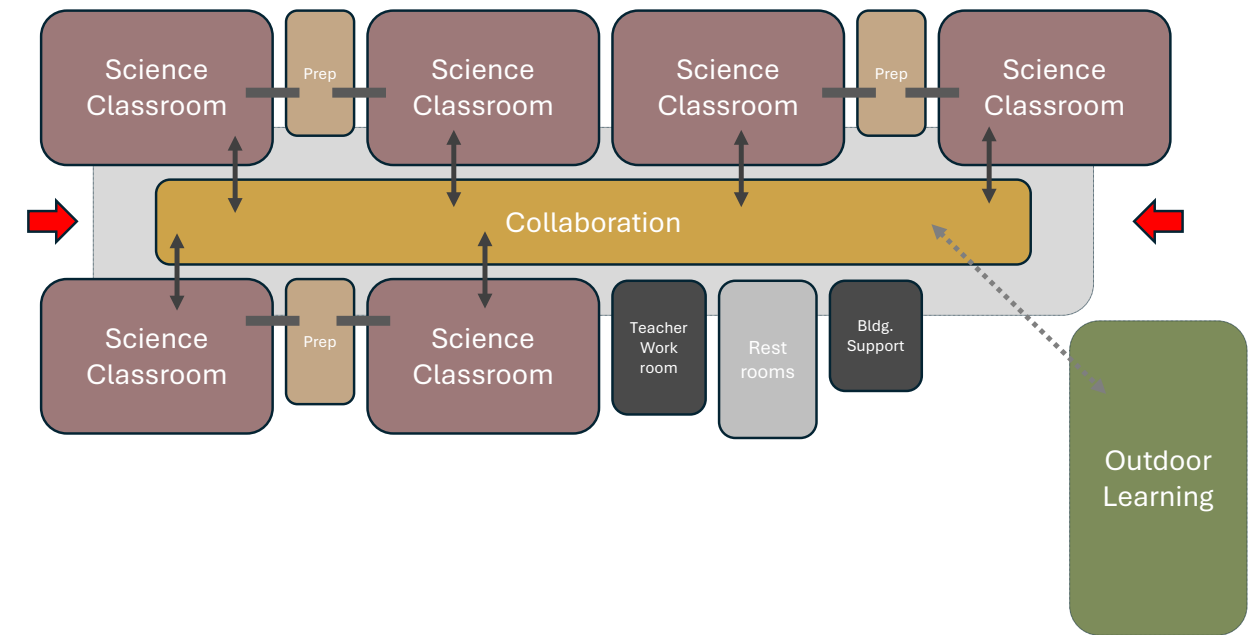
Function

Science laboratories should promote hands-on, inquiry-based activities while maintaining a safe environment appropriate to grade level and subject matter. Classrooms must have adequate utilities and space for activities. Lab stations should support multiple electronic devices, including computers and probe ware. Room layouts should allow flexible seating arrangements to accommodate transitions between classroom discussions and lab activities. Classrooms should have outdoor space access for activities.

Relationships

The Science Department should be self-contained to facilitate material sharing and storage, while integrated with the broader school community and other departments. The department's design considerations include:

- Department Grouping: Science classrooms will be together to facilitate resource and supply sharing.
- Chemistry Labs: Six classrooms will be outfitted for chemistry with fume hoods, and water to support Chemistry, AP Chemistry, Forensics, and Environmental Science. If more than four chemistry labs are needed, there can be a portable fume hood in a Physics space.
- Physics Labs: Two classrooms will be configured for Physics with high ceilings, hooks.
- Biology & General Science Labs: Remaining classrooms will support Bioscience and General Science. All labs will include sinks and adequate exhaust.
- Utilities & Equipment: No distilled water is needed. Vacuum needs will be met via mobile desktop units. Power must support computers and 9–10 hotplates (1,100 watts each) used simultaneously. Laptops are 1:1, stored in carts, and used throughout the science curriculum. Ceiling drop power wheels may be beneficial for flexible use at the center of classrooms.
- Versatility: Flexibility in classroom layout and equipment for varied instructional methods and activities.



Space Program Diagram



Kearney High School - Kearney, NE

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Additional Lab Design Considerations:

- Furniture Stability: Chairs and tables should not have wheels to ensure stable surfaces for experiments and chemical use.
- Cabinet Preference: Marker board upper cabinets are preferred over glass-faced cabinets.
- Lab Stations: A minimum of nine lab stations is required, ten is ideal.
- Sink-to-Table Ratio: Each lab table must have a corresponding sink (1:1 ratio).
- Table Flexibility: Mobile lab tables are preferred over fixed peninsulas for flexibility, even if typically tethered to perimeter casework.
- Table Locking Mechanism: Tables should be able to latch/lock to perimeter counters for stability during experiments.
- Lab Shape & Storage: Rectangular labs are preferred over octagonal designs (e.g., VdLHS). A small number of drawers adjacent to tables is desired; these are no longer assigned to individual students.
- Instructor Table: No fixed instructor table is needed. A side location with water is sufficient. A mobile demonstration table will be used instead.

Lab Grouping

- Labs should be grouped to improve circulation and reduce prep space congestion.
- Physics and Chemistry (or physical sciences) should be grouped together.
- Biology and other science electives should form a separate group.

Special Education Considerations

- Lab environments must accommodate special education needs with appropriate features and activities.

Floor Placement

- First floor is preferred for exterior access.
- Second floor may be beneficial for ventilation.

Prep Space Requirements:

- Must include vented chemical storage: typically three vented cabinets plus one for acids and flammables.
- A locked room (like at FHS) was discussed but deemed unnecessary; cabinets are sufficient.
- Prep space is a no-student zone.

Circulation & Collaboration

- Student circulation and collaboration spaces should be considered in relation to classroom and prep room connections.
- In larger buildings with interior circulation, science spaces risk being buried and losing daylight access.
- Collaboration spaces may be integrated into circulation areas depending on campus-wide square footage allocation.

Outdoor Instructional Space

- An enclosed outdoor instructional yard is desired, ideally near a garden and/or hydroponics area.

CTE Integration

- There is a connection between Physics and Career & Technical Education (CTE). A link via the enclosed outdoor yard is suggested.



Belton High School - Belton, TX