

DESIGNING FOR DISCOVERY

*Planning for hands-on STEAM learning in
pre-K to higher ed learning environments*

$$61 + 39 = ?$$

Tell me and I forget.

Teach me and I may remember.

Involve me and I learn.

Benjamin Franklin

DESIGNING FOR DISCOVERY

Planning for hands-on STEAM learning in pre-K to higher ed learning environments

Learning Objectives

- Understand the benefits of experiential learning
- Explore STEAM integration at all educational levels
- Evaluate the future of education
- Apply lessons to diverse learning environments



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Project Manager
Studio G Architects
Boston, MA



Jay Doherty ALEP, AIA, LEEP AP
Principal
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Understanding development



	INFANT	PRESCHOOL	ELEMENTARY	MIDDLE SCHOOL	HIGH SCHOOL	YOUNG ADULT	ADULT
COGNITIVE	Growing rapidly; limited movement	Energetic; refining coordination	Active; motor skills solidify	Growth spurts; body changes	Fully grown; focus on comfort	Physically capable; may push limits	Varies widely; may be active or sedentary
PHYSICAL	Exploring through senses	Imaginative; learning through play	Concrete thinking; loves facts & structure	More abstract thought begins	Advanced thinking; questioning norms	Critical, reflective, purposeful thinking	Goal-oriented; practical problem-solving
SOCIAL & EMOTIONAL	Bonding with caregivers; needs security	Learns empathy & friendship	Builds self-esteem; peer groups matter	Peer influence strong; identity exploration	Seeks belonging; navigating stress	Focus on identity, autonomy, relationships	Balancing work, life, & emotional priorities
LANGUAGE	Babbling; responding to voice	Storytelling & asking questions	Expanding vocabulary; loves jokes & wordplay	Uses slang, sarcasm, abstract language	Persuasive, expressive, & nuanced	Professional & personal voice emerge	Adapts tone & style to different settings

Infant/Toddler/Preschool



Infants & Toddlers



STATA Child Care Center - M.I.T.

SPARK Child Care Center Playground - Boston Medical



Crispus Attucks Center - Boston



2:00

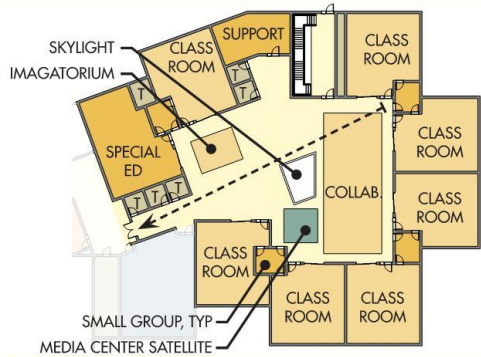


You are a four year old child. Create something!



Elementary (Ages 5-10)

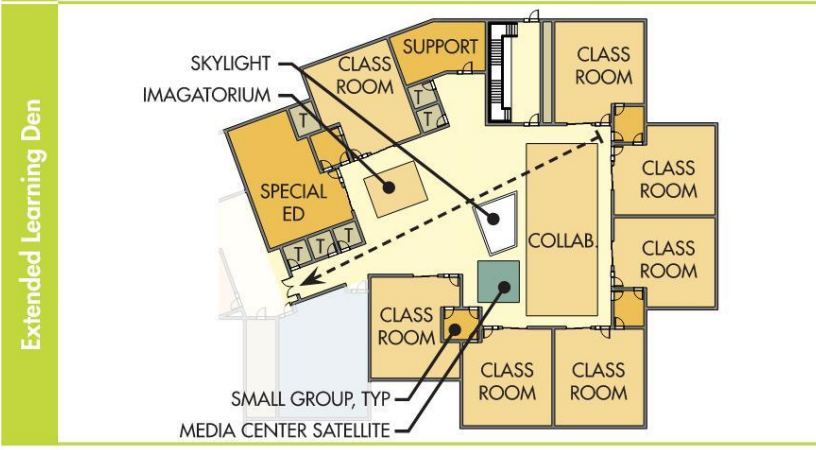
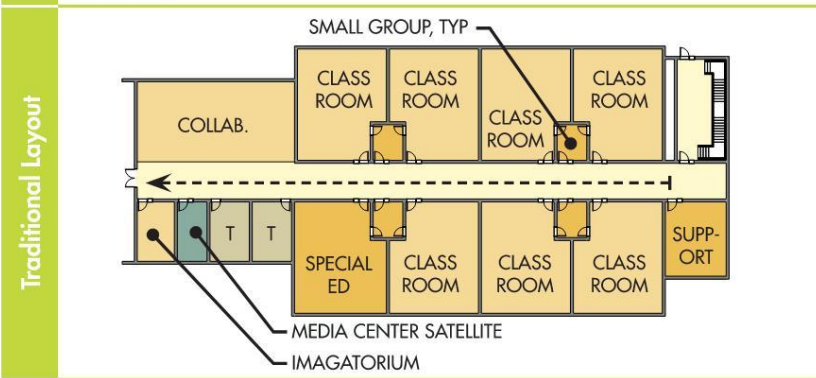
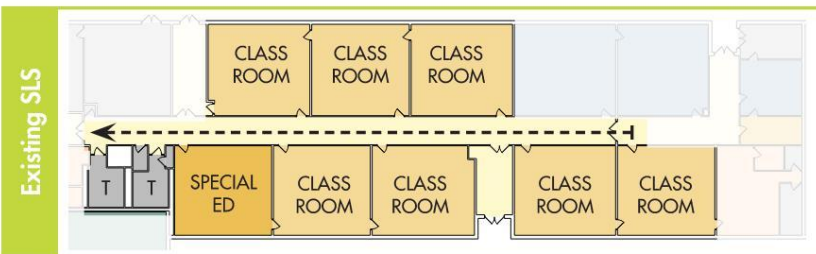




Shaker Lane School

Grades Pre-K-2 | Littleton, MA





	Existing SLS Classrooms	Traditional Layout	Extended Learning Den
Classroom Size	~900-950sf each	1,000sf each (MSBA max)	900sf each (MSBA min)
Existing classrooms are sized well but there are not enough. New classrooms can be smaller but more functional if resources are shared in the Dens.			
Total Grade Level Neighborhood Size	10,470sf	16,360sf	16,600sf
Existing does not have true grade level neighborhoods, with collaboration or support spaces. Unified Arts programs such as Art, Music, and Imagatorium are not centrally located there is a lot of traffic in the narrow corridors.			
Travel Distance	175'	182'	116'
Lengthy travel reduces educational time.			
Multi-Functional Circulation	No	No	Yes
Multi-functional spaces are flexible and cost-effective.			
Equal access to collaboration space	No	No	Yes
Students receive better, faster support with small group rooms and support spaces.			
Natural light in circulation areas	No	No	Yes
Natural light improves educational outcomes.			
Distributed toilet rooms	No	No	Yes
The existing school does not have enough toilet rooms or hand-washing stations. Fast access to toilet rooms improves supervision and reduces travel time.			
Compact footprint	No	No	Yes
Maximizes value of every square foot.			

Elementary (Ages 5-11)



Florence Roche Elementary School (K-5) - Groton, MA



Mountain View School (Pre-K - 8) - Easthampton, MA

Windham Raymond Middle School

New Middle School

Grades 5-8 | Windham, Maine





RSU14 MS



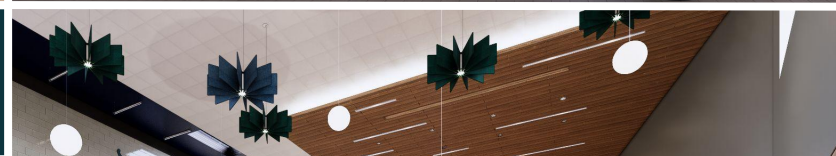
ALL
TEACHER
TEAMING

PLANNING
TIME
TOGETHER

“SPECIALS”
PART OF
THE TEAM

SCHEDULE
BY TEACHER
& PROJECTS

CONTINUITIES
FOR TEACHERS
+ STUDENTS



4:00



**You are in Middle School...awkward!
Work with a partner to combine your creations.**



The Palmer Center

CTE Education

Alvirne High School | Hudson, New Hampshire





Accounting
 Entrepreneurship
 Marketing



Building Construction
 Culinary Arts
 Natural Resources
 Heavy Duty Mechanics
 Welding & Fabrication



Computer Science
 Digital Media
 Engineering + Design



Careers in Education
 Health & Human Services
 Veterinary Science



Air Force JROTC





Franklin Cummings Tech (FCT)

Vocational Certificate & Degree Programs

Roxbury, Massachusetts

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Higher Education

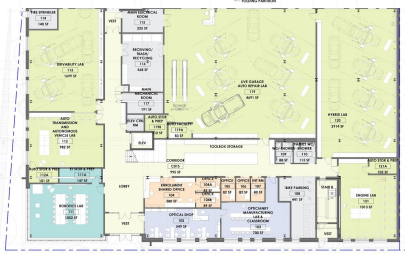
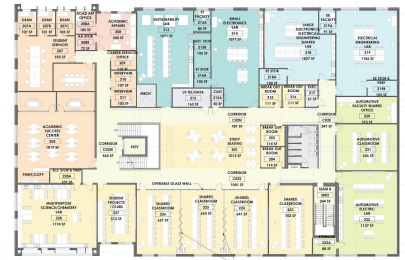
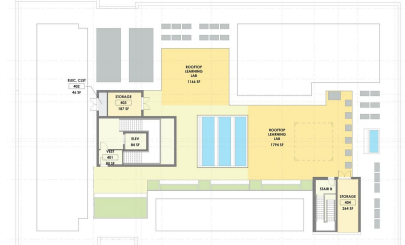
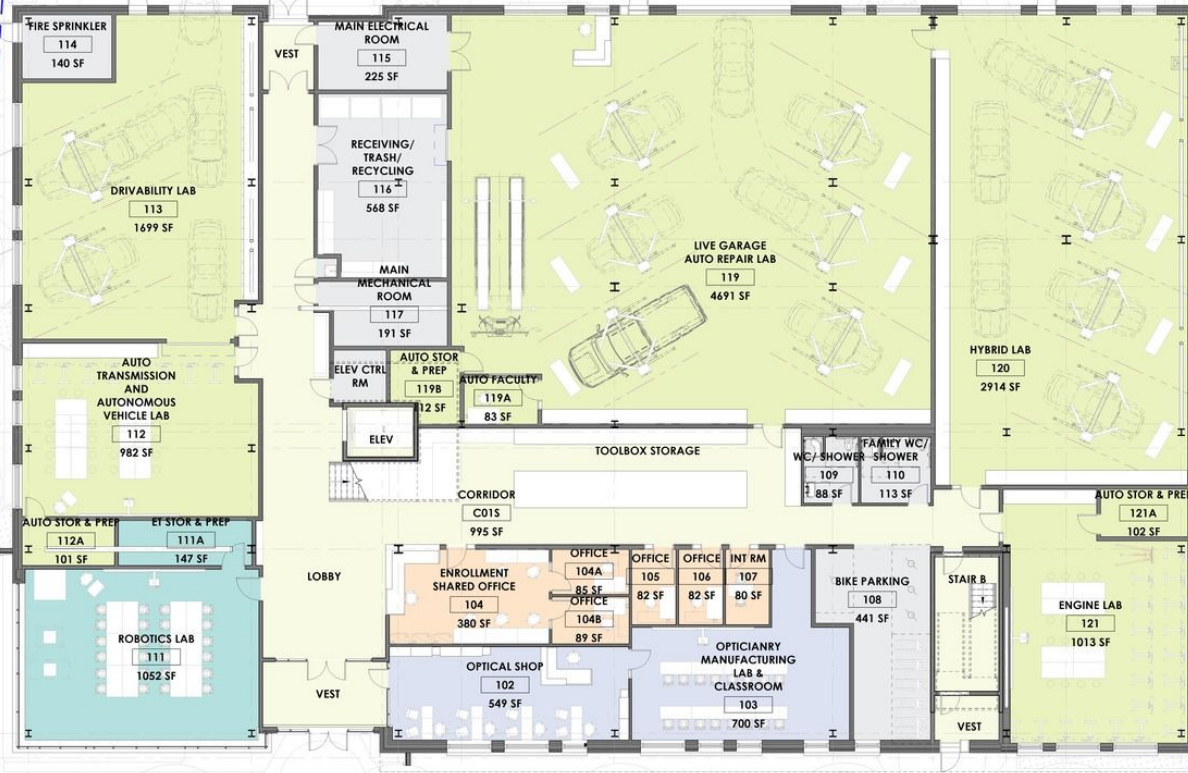


- 
 Energy Star Appliances
- 
 Solar Shading
- 
 Continuous Insulation/Airtight Enclosure
- 
 Solar Electric Panels
- 
 Variable Refrigerant Flow (VRF) HVAC
- 
 Bike Storage
- 
 Natural Ventilation
- 
 Energy Recovery Ventilation
- 
 Watersense Plumbing
- 
 Sustainable Site
- 
 Energy Usage Display

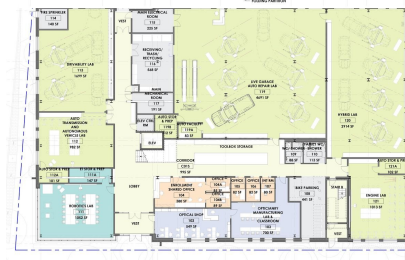
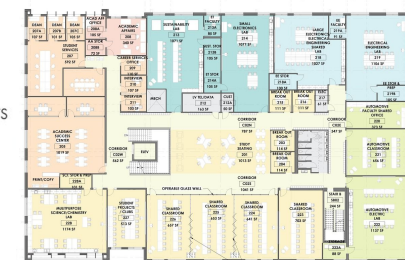
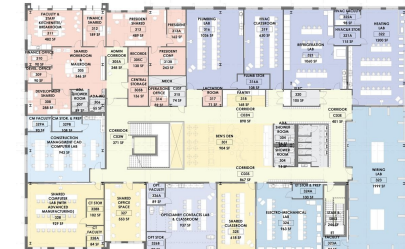
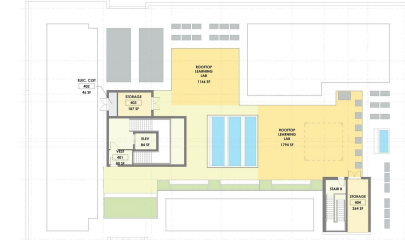
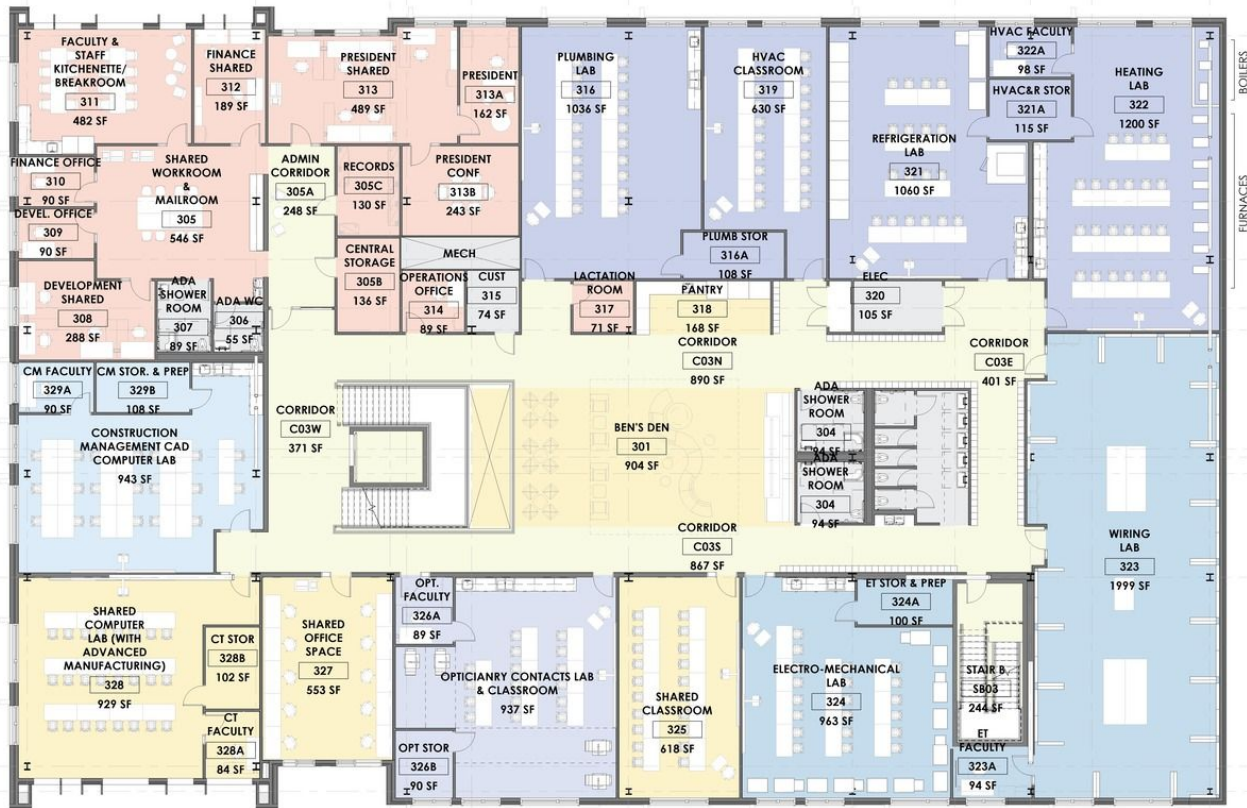
SUSTAINABILITY GOALS

- Low Energy Design / LEED Certifiable / Passive House
- De-carbonize
- Healthy & Responsibly Resourced Materials
- Water Conservation
- Sustainable Site - Native Planting
- Building As A Teacher
- Renewable Energy



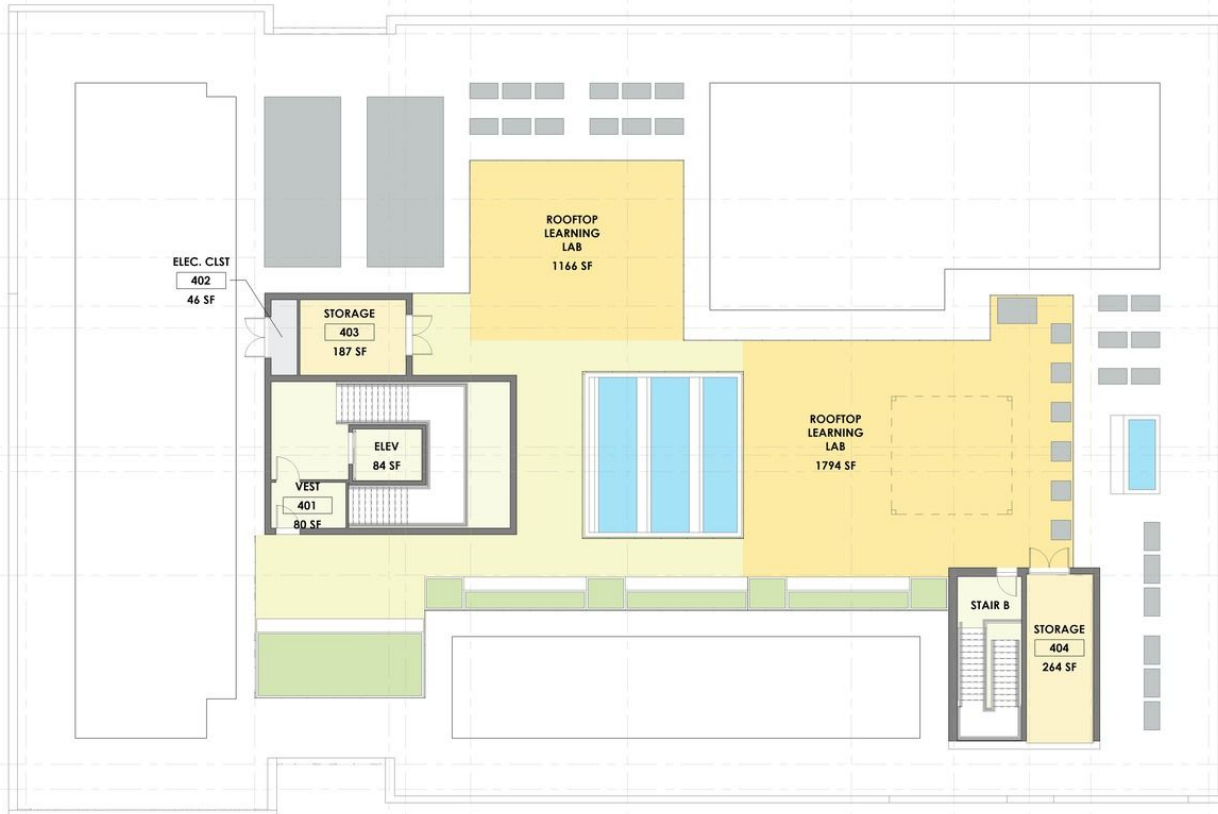


- ACADEMIC DEPARTMENTS**
- Automotive Technology
 - Construction Management
 - Electrical Technology
 - HVAC & R
 - Electrical Engineering
 - Engineering Technology
 - Opticianry
- ADMINISTRATIVE**
- STUDENT COMMONS
 - SHARED SPACES
 - CIRCULATION
 - BUILDING SYSTEMS
- N

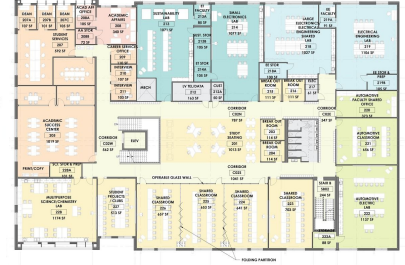
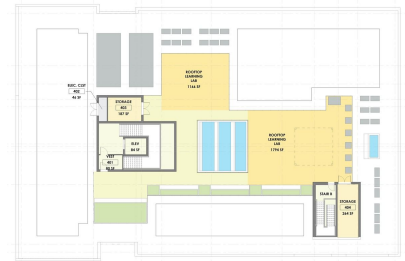


BOILERS
FURNACES

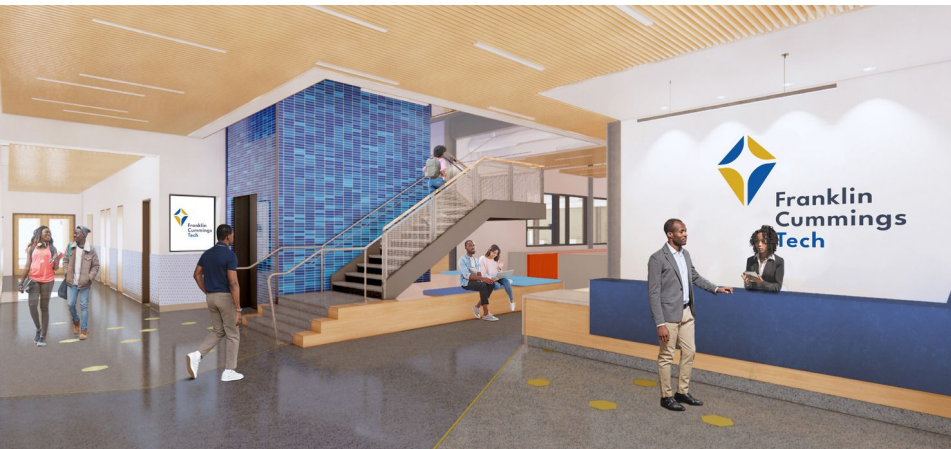




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- N



Higher Education



08:00



**It's your first day at your first job. Team project time!
Create a story using all the combined creations at your table.**





**WE ARE ALL
STUDENTS**



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