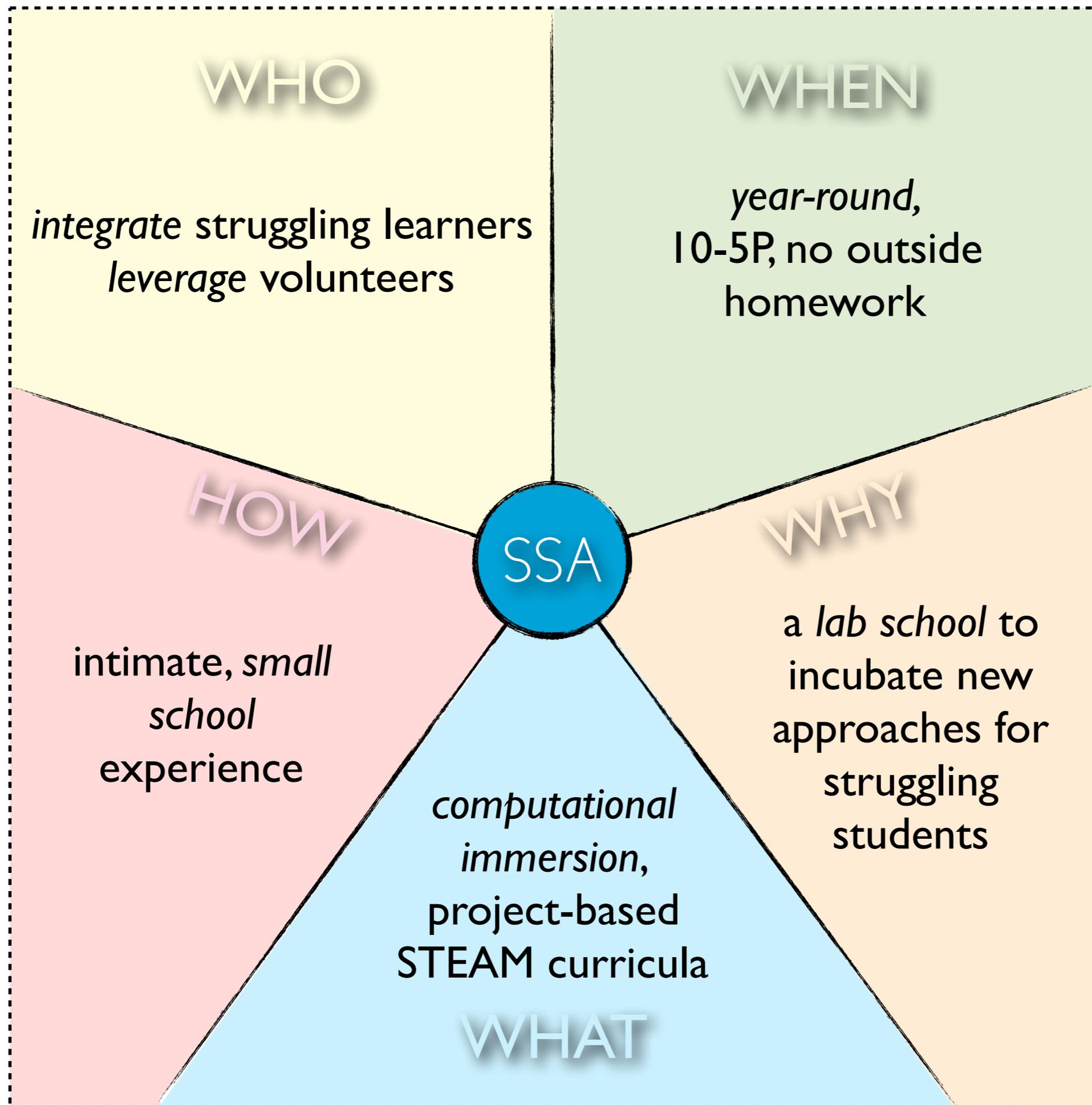


# SOMERVILLE STEAM ACADEMY

last revised 1 August 2015

The Somerville STEAM Academy will be a **vocational lab school** emphasizing **computational immersion** and targeting **struggling students** offering an intimate, **small school** setting where learners will explore **project-based** curricula integrating the **arts & sciences**. The SSA will feature **tight community integration** via **internships & mentorships** and will rely on tie-in volunteer effort throughout Somerville.

In **Fall 2017** the SSA will open to **~36 6–8th grade students** and grow to include **8-12<sup>th</sup>** grades. Fully **50% will be identified as 'struggling'** (bottom half of MCAS, attendance rates), and the remaining **50% will match their cohort's demographic & socioeconomic** profile.



No single school can serve every student equally well. This means a diversity of options is a good thing, and every piece of the SSA has been designed to minimize duplication of effort and address new opportunities or old problems in new ways.

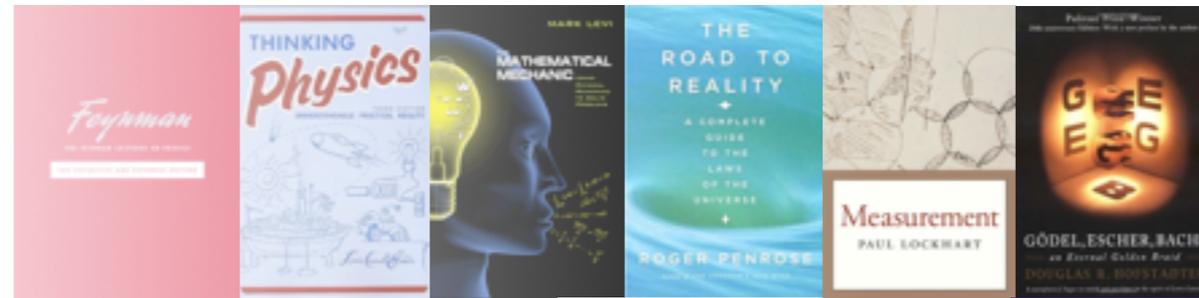
We already know that SHS is the right place for many students. The SSA will offer new chances that are neither currently nor are planned to be offered in the near future. Options like a small school experience; a lab school; a deeply project-based approach (much less a computational focus)--all of these are new to Somerville. And in some cases, the nation.

And all Somerville students stand to benefit for having access to them. The SSA will be an experiment combining several, hybrid models of successful schools & programs nationwide.

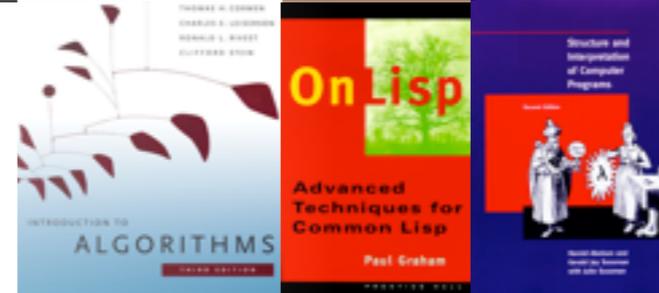
The SSA is like a new sports or theater offering. For students who otherwise might not find their place or their opportunity to excel, the SSA will offer a chance to do so.

There won't be a 'math class' per se; questions will drive projects & many, complementary texts will come together to form the base of students' work.

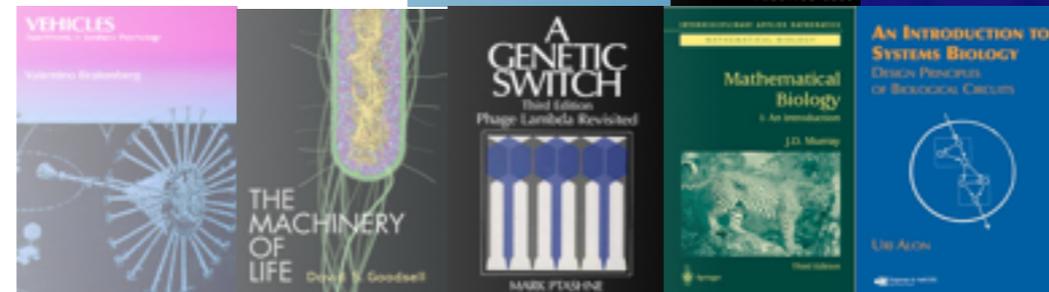
# PHYSICS



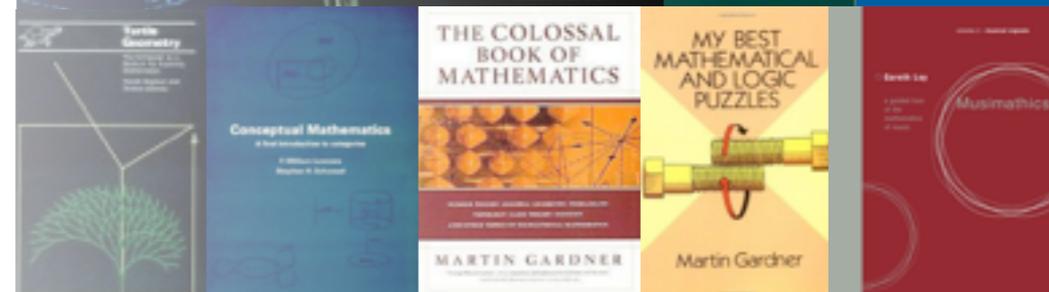
# COMPUTER SCIENCE



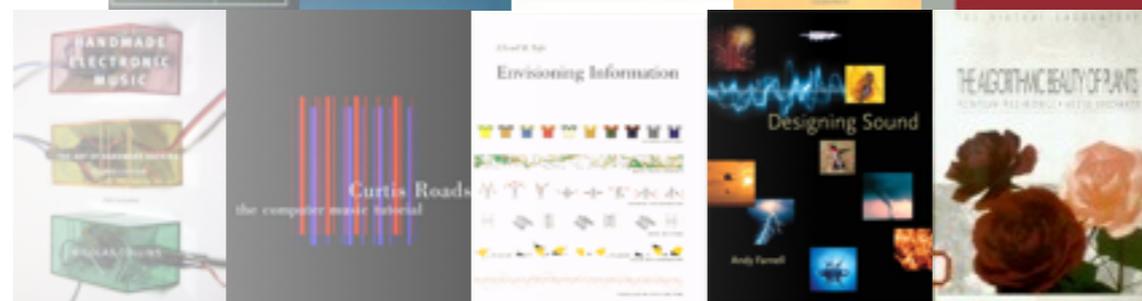
# BIOLOGY



# MATHEMATICS



# ART & MUSIC



Many of the topics we teach and approaches we adopt in school reflect the realities of pencil, paper, & blackboard. Project-based--not to mention computational--approaches to these topics open up new ways to engage.

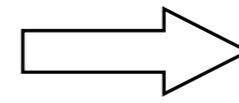
But this doesn't mean we'll be starting our curricula from scratch. Not only has sprout's four years of experience designing and running programs in greater Boston partially prepared us, there's a plethora of texts beginning to dig into these new approaches.

Many of these texts are regarded as classics already, but simply have never been brought to project-based contexts at the high school level. The texts here are a few of those we'd begin with.

Rather than focus on a curricular standard, projects will be driven by big, motivating questions (e.g. "What does it mean for something to be alive?") which, when explored in-depth, will connect to many other pieces of traditional curricula.

40 students, \$13,842/student

+ \$1,300/student via MA DOE ELT



\$605,680/y



Starting with the same allocation as any other Somerville Public School, we'll be bringing in another \$1,300 per student per year through Massachusetts' Extended Learning Time program. The SSA will be spending just as much or more, per student, on SPED & ELL as SHS.

The increased starting salary and amenities like laptops for every student and a yearly stipend come from bringing many of the District functions (like guidance) under a single roof. Traditionally centralized District functions (like art or psych. services) will be handled on a per-student basis, with the SSA paying back the District for those services.

Overall, the emphasis is on making it possible to spend the per capita allocation in a more individualized way while avoiding taking money out of the district. To ensure this, we went line-by-line through the District's end of year audit and selected centralized items whose cost should be shared by all, deducting them from the initial per capita allocation of \$16,108 per student per year.

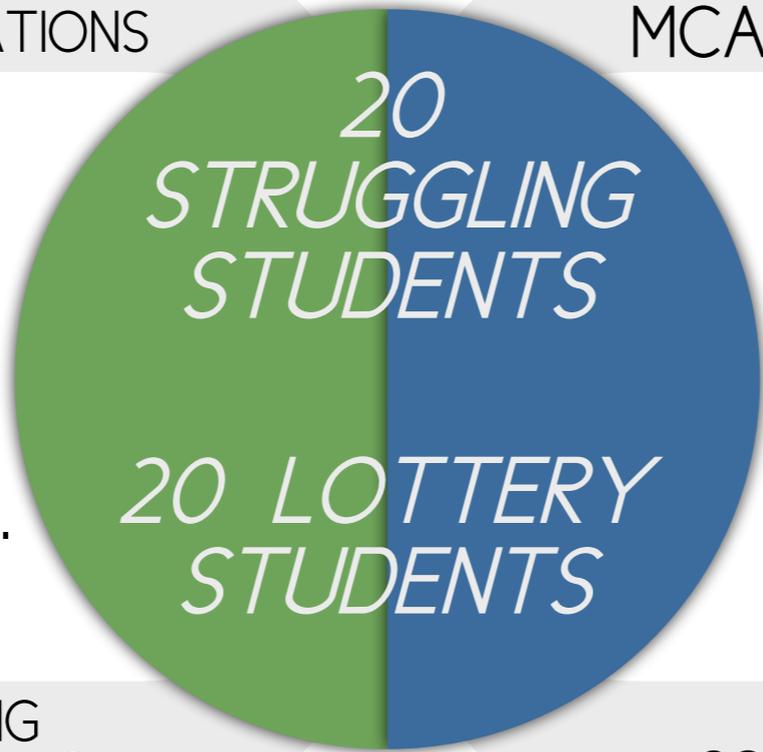


## Students struggling with traditional options

PARENT, TEACHER RECOMMENDATIONS

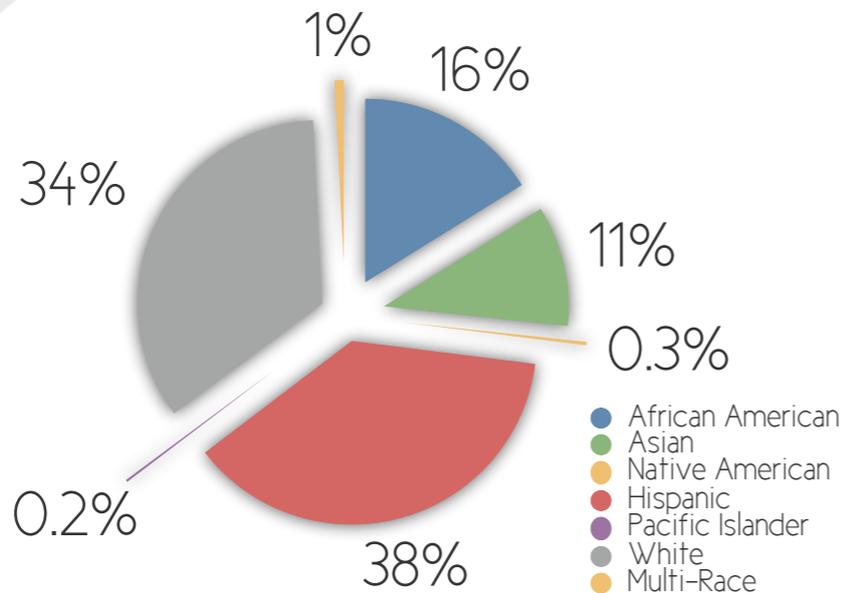
BOTTOM 50% OF MCAS, ATTENDANCE

No single school can serve every student equally well. This means a *diversity* of options is a good thing.

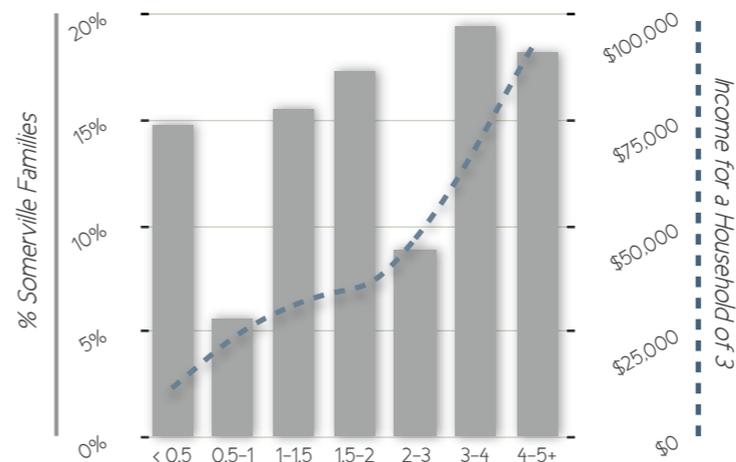


We will focus on struggling students **not** through remediation, but *new kinds* of chances to excel.

MATCHING DEMOGRAPHIC



MATCHING SOCIOECONOMIC

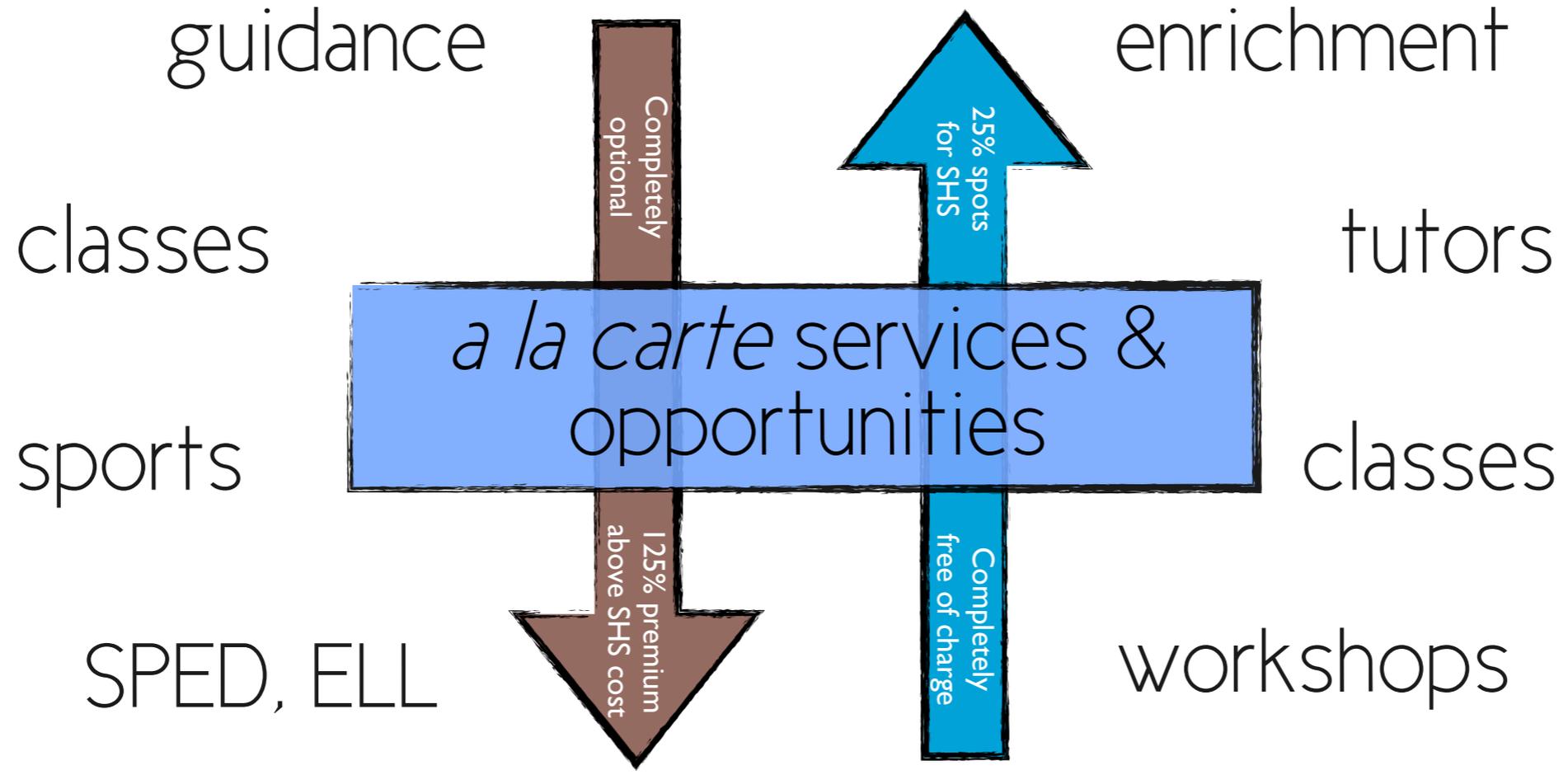


The SSA is committed to avoiding the 'creaming' of students from SHS. That means focusing on struggling students and guaranteeing that the socioeconomic and demographic profile of the SSA matches that of SHS.

50% of students will be "struggling"--meaning 1) a middle school teacher recommends them as such, 2) their MCAS scores are in the bottom 50%, or 3) their attendance rate is in the bottom 50%.

The remaining 50% of students will be drawn from a lottery, weighted to match the socio-economic & demographics of SHS.

Enrollment will occur in three phases. 1) Outreach and programming will generate community interest. If 3m into this, interest is not broad & diverse enough to match our equity commitments, we'll begin 2) targeted outreach, i.e. we will continue initial outreach, but begin contacting families whose children meet our equity goals. And finally, in the last 3m of the enrollment process, 3) an opt-out lottery will be the contingency plan for any remaining gaps.



# Somerville STEAM

Many of SHS's offerings cannot be matched. We are trying to avoid duplication of effort. To that end, we've worked to make the interface between SHS & the SSA as permeable as possible. Students from both institutions will be able to cross-register for classes & services at the other.

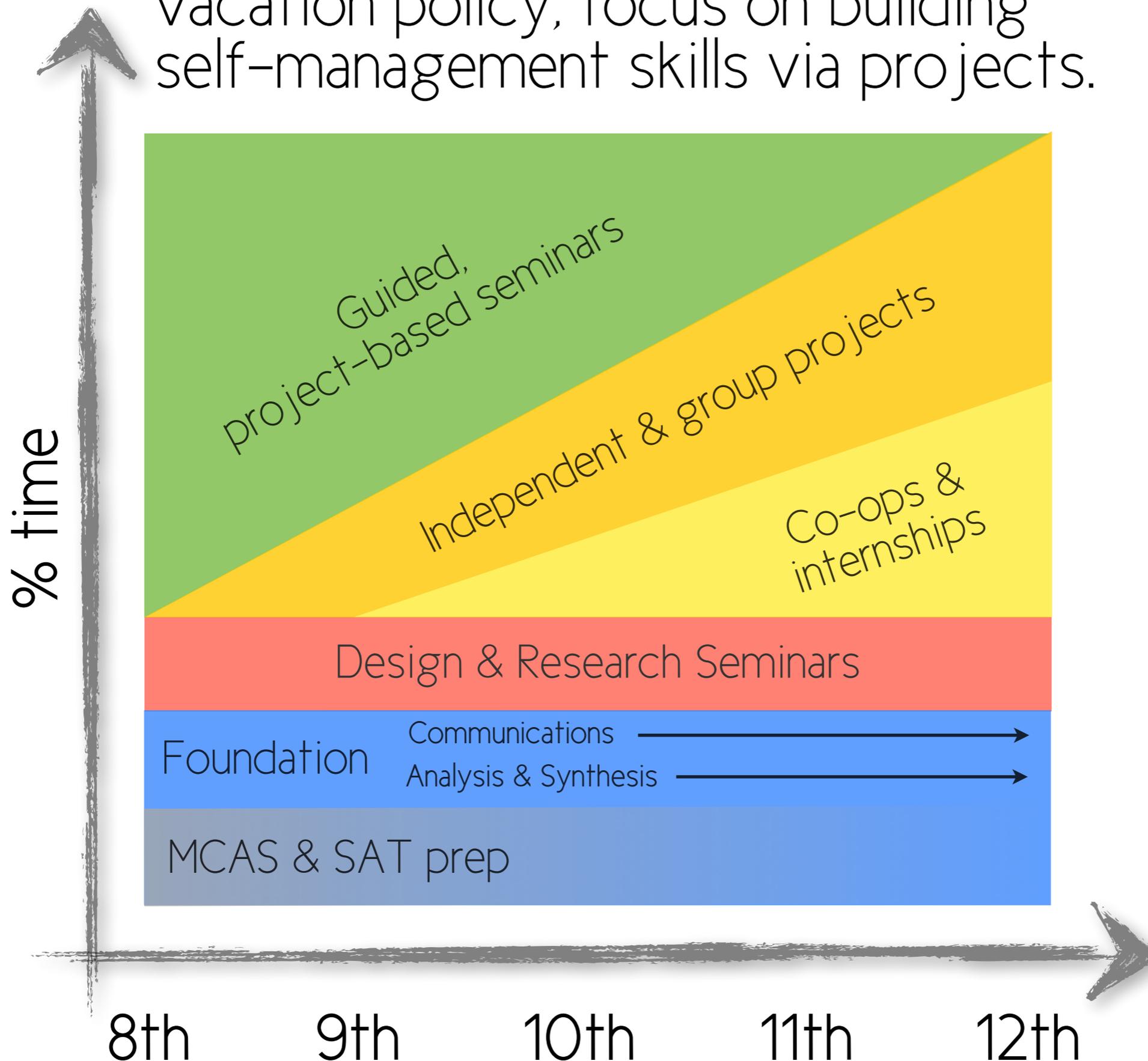
For SHS, this is free, and up to 25% of any SSA program can comprise SHS students. The SSA will pay 125% of a prorated, student-hour cost for participation in classes, sports, and so on.

SHS teachers will have the final, completely optional say in whether SSA students cross-register. The SSA will have no option but to enroll (up to 25% of a program) SHS students.

The SSA will be entirely responsible for the transportation, funding, and logistics to make this possible.

Overall, we're keen for the SSA to *augment*, not supplant, current options in Somerville. And we're ready to bend over backwards to make that work for all involved.

Year-round, 10A-5P; open, staggered vacation policy; focus on building self-management skills via projects.



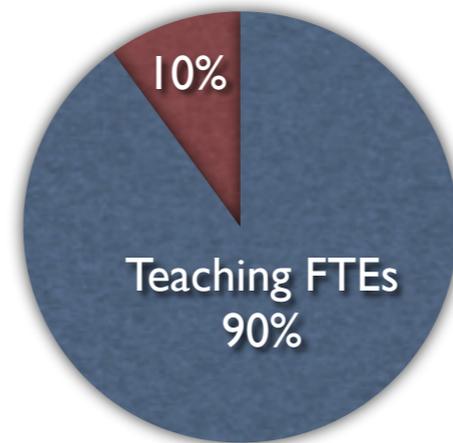
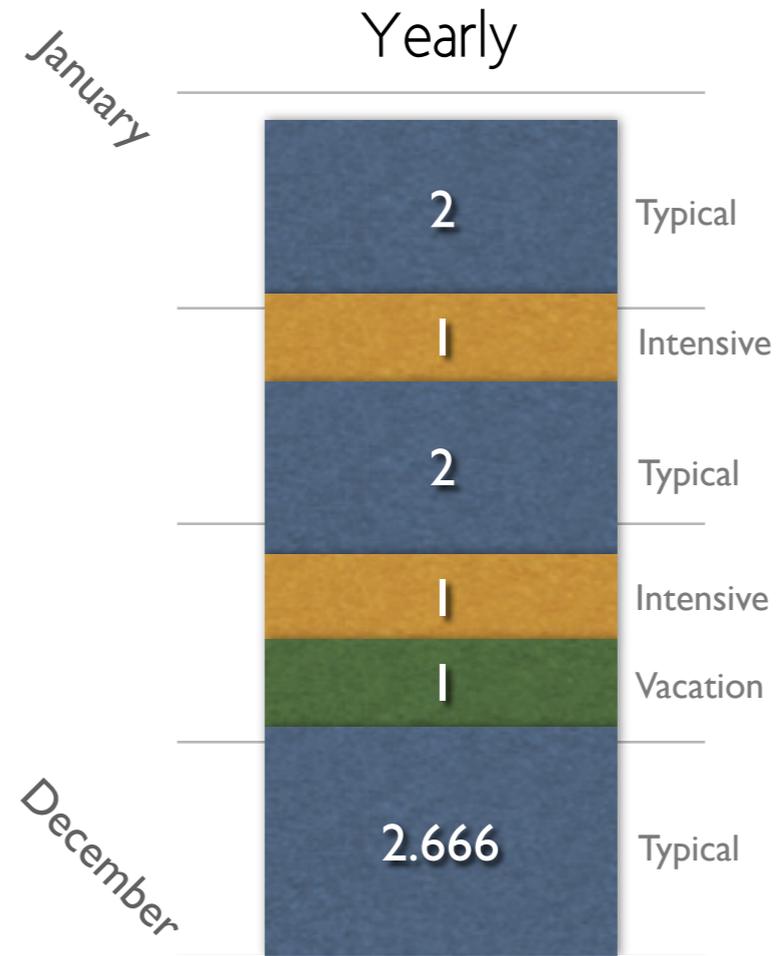
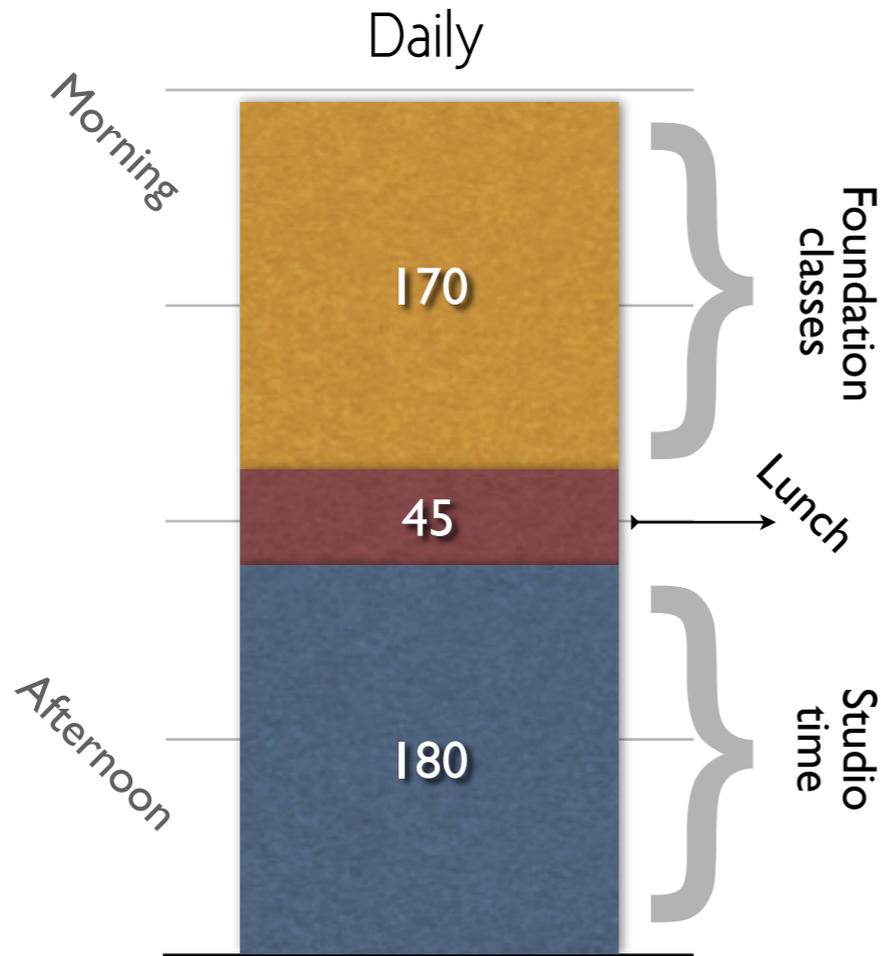
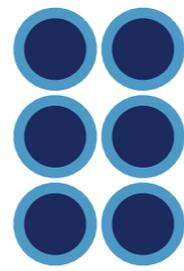
The SSA is focused on supporting students' transition from *student*--i.e. a receiver of information--to an *independent investigator*. That involves articulating questions you care about, rustling up the resources to do the necessary project or experiment, and documenting or sharing those results.

This fits with the SSA's focus on project-based approaches. But you can't simply dump a student into an open-ended, unstructured context. Scaffolding that transition is the job of the student's Advocates.

There are basically three species of time at the SSA: 1) structured seminars, 2) project/studio time, and 3) intensive workshops. Over time, the portion dedicated to open-ended projects and group work will increase. This is all on top of ongoing training in test-taking and the basics of communications, analysis, and synthesis.

Our goal is to provide support as students are challenged to develop their executive function and teamwork skills in increasingly open-ended contexts.

# Generation Schools



The year-round, staggered vacation setup and time breakdown of the SSA is inspired by the successful Generation Schools model:

*To reduce class size - We have "all hands on deck" at key times.*

*To expand the school year - We stagger teacher vacations.*

*To expand the day - We trade "time for time."*

*We offset longer school days with somewhat shorter training days: trading time for time. The total work hours balance out to be the same as in any school. As a result, it does not cost more.*

*FOUNDATION courses every morning, STUDIOS every afternoon, and INTENSIVE COURSES twice yearly.*

The SSA will be year-round, but will use the staggered schedule and foundation/studio/intensive breakdown as a starting point. But to address issues of equity in home support, students won't be expected to do homework outside of the daily 10A-5P schedule.



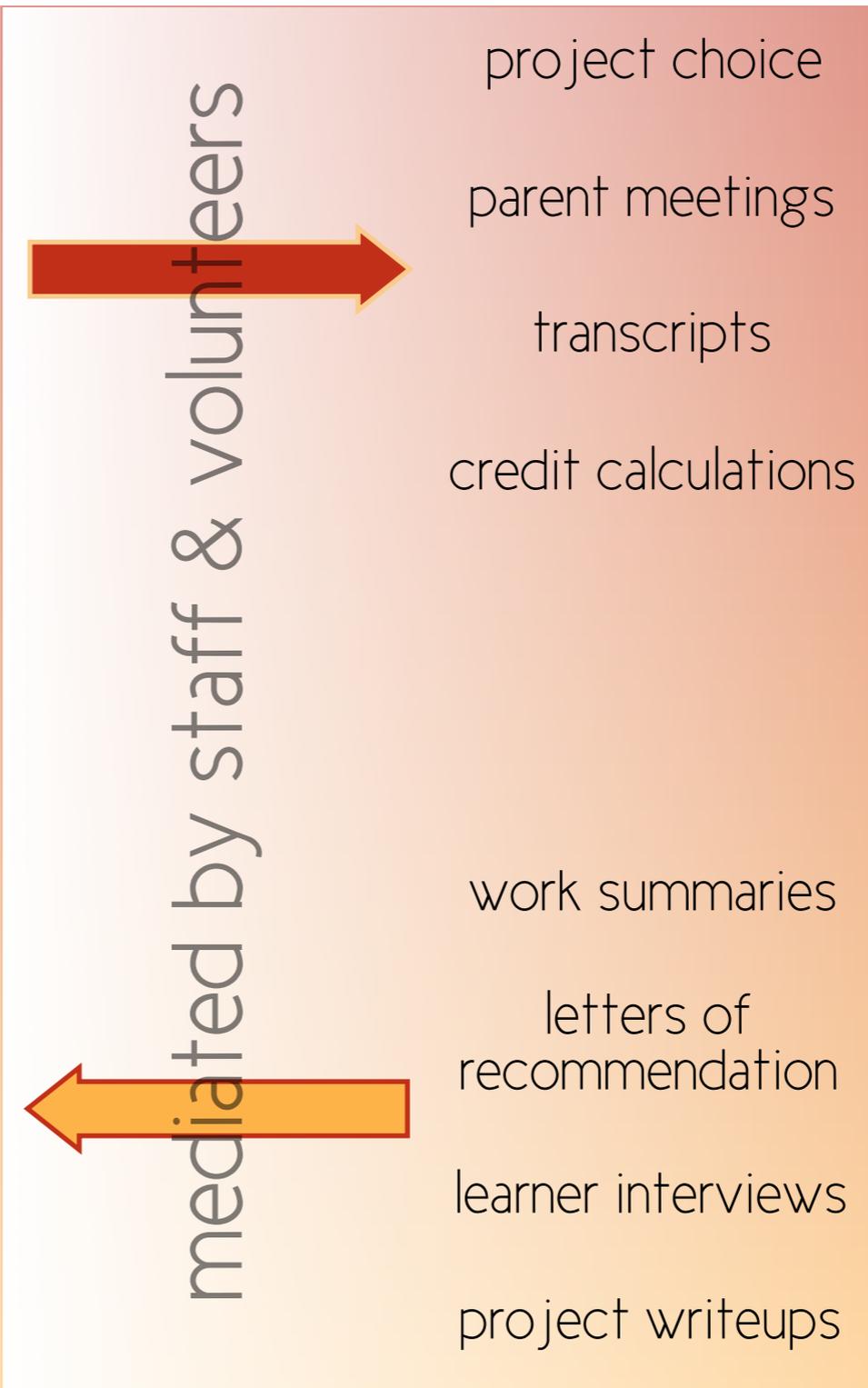
# High fidelity project documentation

**Construct and compare linear, quadratic, and exponential functions. Solve problems.**

- CCSS.Math.Content.HSF-LE.A.1 Distinguish between functions that can be modeled with linear functions and with exponential functions.
  - CCSS.Math.Content.HSF-LE.A.1a Prove that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.
  - CCSS.Math.Content.HSF-LE.A.1b Recognize that one quantity changes at a constant rate per unit interval relative to another.
  - CCSS.Math.Content.HSF-LE.A.1c Recognize that a quantity grows or decays by a constant percent per interval relative to another.
- CCSS.Math.Content.HSF-LE.A.2 Construct linear functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (reading these from a table).
- CCSS.Math.Content.HSF-LE.A.3 Observe using graphs and data that a quantity increasing exponentially eventually increases linearly, quadratically, or (more generally) as a polynomial function of degree  $n$ .
- CCSS.Math.Content.HSF-LE.A.4 For exponential growth and logarithms, the solution to  $ab^{ct} = d$  where  $a$ ,  $c$ , and  $d$  are positive real numbers and the base  $b$  is 2, 10, or  $e$ ; evaluate the logarithm using technology.

**Interpret expressions for functions in terms of the situation they describe.**

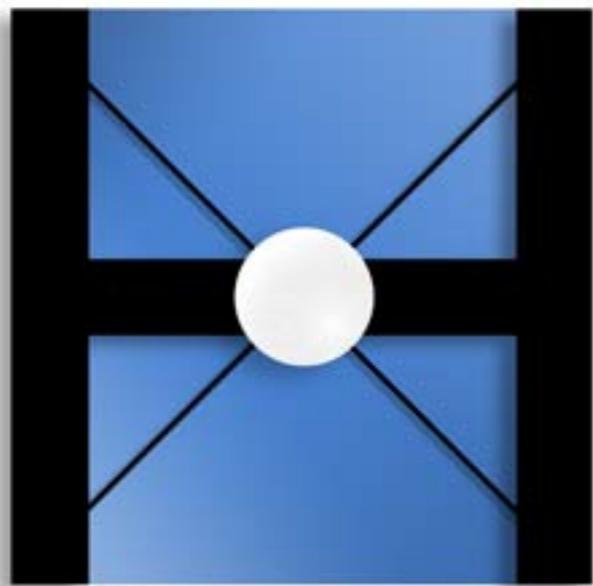
- CCSS.Math.Content.HSF-LE.B.5 Interpret the parameters of a linear or exponential function in terms of a context.



A core piece of the SSA's design is the *curriculum mapping process*. Because projects don't necessarily fit neatly into a curriculum like the Common Core, planning projects ahead of time to walk every student through is a challenge.

Instead, students and staff will develop and complete projects, worrying only about making those projects deep & interesting. Then, *retrospectively*, SSA staff will document what pieces of the Common Core a student has covered, using their interviews, exhibitions, essays about the project, etc.

Then, when students are choosing projects in the future, staff members will take into account what parts of the Common Core they have covered. In this way, instead of staff thinking, "What does everyone need to cover today?" each student will have an individualized record that can be broadly planned around, but needn't define day-by-day or week-by-week lesson plans.



HIGH TECH HIGH

## PROJECT EXHIBITIONS, TEAM TEACHING

[...] change in schooling happens, not by incrementally adding programs [...] but by generating holistic designs that enable new ways of teaching & learning. [...] 4 principles: personalization, adult world connection, & common intellectual mission, teacher as designer. [...] call for structures and practices that schools do not now routinely employ. [...] small size of the school, the openness of the facilities, the personalization [...] the emphasis on integrated, project-based [...] exhibitions, the requirement that all students complete internships in the community, and the provision of ample planning time [...] Serve a student body that mirrors the ethnic and socioeconomic diversity of the local community. [...] 100% of graduates have been accepted to college



## EXPEDITIONARY LEARNING

## STUDENT-AS-CRAFTSMAN, PROFESSIONAL

The idea is to put really important & difficult work together with great joy in doing it. [...] Engage communities in their learning by leading family conferences and making formal presentations to expert panels [...] Complete projects that challenge them to do the work of professionals—scientists, historians, mathematicians, writers, and artists [...] Codman Academy Charter Public School is an Expeditionary Learning school in Dorchester [...] They focus six days a week on rigorous coursework, in-depth projects, and internships that prepare them for success [...] Since the first students [...] all of Codman's graduates have been accepted to four-year colleges. Even better, 75% of them have either graduated or are still enrolled.

*High Tech High began in 2000 as a single charter high school launched by a coalition of San Diego business leaders and educators. It has evolved into a network of schools spanning grades K-12, housing a comprehensive teacher certification program and a Graduate School of Education.*

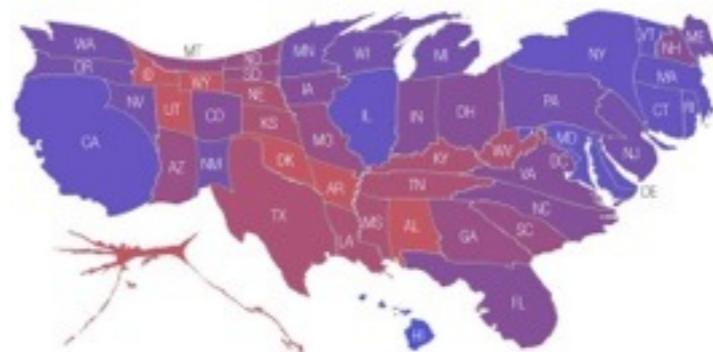
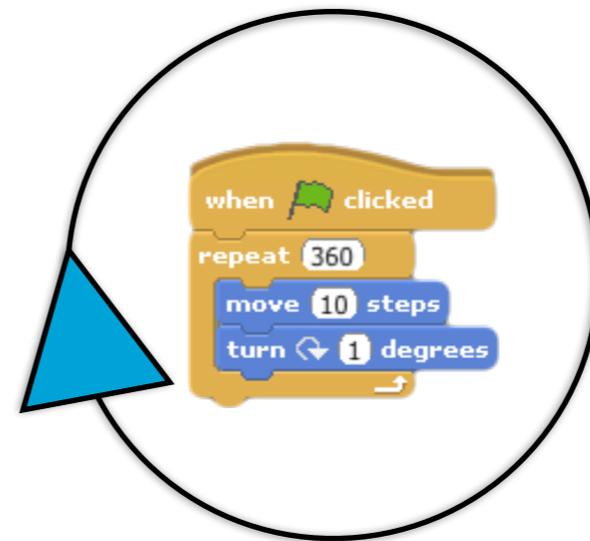
*High Tech High now operates 11 schools in San Diego County: two elementary schools, four middle schools, and five high schools. All of these schools serve a diverse, lottery-selected student population; all embody the HTH design principles of personalization, adult connection, common intellectual mission, and teacher as designer.*

*The EL model is based on research and honed by 17 years of working closely with schools and districts. [...] Schools implementing our model have test scores that exceed district averages, often by substantial margins, particularly for high-need subgroups. In our exemplary high schools, 100% college acceptance is the standard.*

TRADITIONAL approaches prioritize symbolic manipulation & a disposition for academic modes. COMPUTATION offers interactive approaches & opens up domains previously unapproachable.

$$x^2 + y^2 = r^2$$

...the set of all points equidistant from another...



The reasons we teach the quadratic equation have more to do with the omnipresence of paper, pencil, and blackboard. Conic sections were not decided upon as 'more important' than other math--among other things, they are easy to teach and test in a purely written environment. Computers open up new ways of engaging with and exploring old math, and open up all sorts of math that was traditionally much harder to access.

We think this is true in many other parts of the curriculum. Not everywhere, but in many places. While we may not cover the "canon of English Literature," we *will* be focused on ensuring students fall in love with reading. While they might not cover "Ancient History," they *will* learn to read, analyze, write, and argue effectively.

We think this is the seed of a novel approach which stands to dramatically expand options for students who have struggled with traditional options.

Somerville and its surroundings are chock-full of incredible (but largely unleveraged) resources. These will be central to SSA's strategy for developing new kinds of educational opportunities.



Somerville is chock-full of amazing people, companies, and organizations. Rather than focus on *preparing* students for the real world, the SSA is focused on *engaging* students with it, leveraging community resources to get students out of the classroom and into real projects with real people.

Whether that involves internships at Google or replacing a cafeteria with a food stipend they can spend at local restaurants or third party providers offering mentorship and enrichment, the SSA will make interfacing with the tremendous resources in Somerville and Boston a priority.

While staff will obviously have their own domain expertise and interests and often teach from those, their more essential function will be to act as coach, mentor, and facilitator. This means that the shared responsibility of the staff and administration will be to ensure that enough money, community connections, and institutional partnerships are developed to satisfy students' needs.



## VOLUNTEER-BASED APPRENTICESHIP MODEL

Students discover new fields alongside adult volunteers—Citizen Teachers—who bring their expertise to life. [...] a multidisciplinary service experience combining teaching, youth development, community-building, and data analysis [...] hands-on curricula [...] link academic skills (aligned with common core standards) to college and career success [...] Students create and present an end product—what we call a WOW!—to share what they’ve learned with families, teachers, public officials, community members, and business leaders. [...] In 2011-2012, 73% of Citizen Schools students were eligible for free or reduced price lunch. The majority of students identified as Latino or African American. More than one-third of Citizen School participants spoke a primary language other than English at home.



## COLLEGIATE INTEGRATION, SELF-MANAGING FOCUS

North Star helps its college-bound members in numerous ways. We offer GED prep, portfolio gathering, letters of recommendation, and most important, counseling. [...] established strong relationships with our local community colleges (Holyoke, Greenfield, and Springfield Tech), having sent hundreds of our members their way. They know us and our members, and they are thrilled to receive North Star teens. [...] The idea that leaving kids alone is the only alternative to requiring kids to do things is, we would venture to say, one of the most common misconceptions about the self-directed learning option that North Star offers. [...] Some come because going to school has been an unpleasant experience socially, and they dread going to school each day.

*Citizen Schools runs for three hours in the afternoon, Monday–Thursday. Programming runs during an expanded school day, usually for the entire sixth grade. Alternately, Citizen Schools runs as an after-school activity for enrolled students from 6th, 7th and 8th grades*

*In 2011–2012, 73% of Citizen Schools students were eligible for free or reduced price lunch. The majority of students identified as Latino or African American. Over 33% of participants spoke a primary language other than English at home.*

*North Star is a center for self-directed learning and community-based education functioning like a YMCA or other member organization. Teens choose from among a wide array of educational options depending on their needs and interests. Founded in 1996 by two middle school teachers, we are now in our 16th year of serving teenagers who prefer to pursue their educations outside of traditional schooling.*

# COHORT-DRIVEN ADVOCATE MODEL

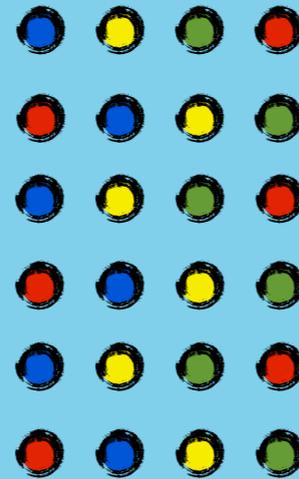
Curriculum Developer

Social Worker

Project Manager

The SSA's project-based focus means staff will act more as **mentors** and **facilitators** than instructors. Every **~36** students will form a single cohort, overseen by a **trio of staff**, their advocates.

1:12 STUDENT:STAFF



Inspired by Harlem Children's Zone's **academic case management model**, this setup offers high-touch, **individualized attention** and team teaching capacities, focusing on students' **whole development** as independent investigators.

The SSA's staff structure is inspired by the Harlem Children Zone's Academic Case Management model. A trio of specialized staff (students' *advocates*) will manage a cohorts of ~36.

One advocate will be responsible for managing the *curriculum development*, brainstorming projects, finding relevant texts, designing intensive workshops, etc.

Another advocate will be responsible for social work. This could mean anything from knowing a student is struggling with food security issues to know-ing its their birthday and throwing a mini-party for them.

And the final advocate will act as a project manager, helping students manage their time and money.

Students will also receive the support from adults who will serve as community mentors (akin to academic advisors in a college undergraduate program) and project advisors (domain experts who will help to design and then evaluate their personal projects).

# COMMUNITY-DRIVEN PARTNERSHIPS

The SSA will be **tightly integrated with the Somerville community**, partnering with universities and employers to provide internship opportunities & employing local artists, scientists, & college students as mentors & project advisors.

INSTITUTIONAL PARTNERSHIPS >>>>>   

COMMUNITY MENTORSHIPS >>>> 

PROJECT ADVISORIES >>>> 



## ACADEMIC CASE MGMT INDIVIDUAL ACTION PLANS

Academic Case Management (ACM) is a holistic approach to youth development that each HCZ site serving Middle School, High School and College Success students employs to strengthen our mission to support the healthy emotional, social, intellectual, physical and professional development of each child throughout his or her lifespan. [...] Student Advocates, assigned by students' grade-level [...] work with each person to create individualized Action Plans that identify concrete strategies to enrich and support the student's academic achievement, college readiness and personal growth.



## STUDIO CRITIQUE MODEL FOR STUDENTS & STAFF

We had a review process that was actually a combination of some things that Jonda learned from Disney, along with things that were at ILM. But it was unique because of that combination. But what it amounted to was that, in the process of making the film, we reviewed the material every day. Now, this is counterintuitive for a lot of people. [...] Most people [...] don't want to show something which is weak or poor. So you want to hold off until you get it to be right. And the trick is, actually, to stop that behavior. We show it every day when it's incomplete. [...] And when you get over the embarrassment, you're more creative.

*In the early 1990s, HCZ ran a pilot project that brought a range of support services to a single block. The idea was to address all the problems that poor families were facing: from crumbling apartments to failing schools, from violent crime to chronic health problems.*

*In 1997, the agency began a network of programs for a 24-block area: the Harlem Children's Zone Project. In 2007, the Zone Project grew to almost 100 blocks. Today the Children's Zone serves more than 8,000 children and 6,000 adults.*

*PIXAR is an American computer animation film studio in California. The studio is best known for its CGI-animated feature films created with its own implementation of the standard RenderMan image-rendering application programming interface used to generate high-quality images. [...] The studio has earned 27 Academy Awards, seven Golden Globe Awards, and eleven Grammy Awards, among many other awards and acknowledgments.*

## articulation agreements & customizable transcripts emphasizing *fidelity & personalization*



	EXTERNAL	INTERNAL	REFLECTIVE
FORMATIVE	work summaries, support letters	peer, staff evaluations	journal, personal site
SUMMATIVE			resume, portfolio

Assessment is a natural challenge in a project-based setup. Rather than try to standardize projects or make do with a one-dimensional measure like grades, the SSA will focus on a multifaceted approach to assessment.

Students will be reflecting on their work, peers, staff, and community members will interview and critique students' work. In addition to the MCAS/SAT and students' corpus of work mapped back to the Common Core, this collection of high fidelity assessment will be collated into custom transcripts and measures, all emphasizing a *personalized and individualized* approach.

This will involve a variety of often qualitative work assessments and artifacts--just like the real world. We'll be uniting models from success stories like High Tech High, New College, Big Picture Learning, and Expeditionary Schools.

This doesn't mean that there won't be a fine-grained measurement of what pieces of the curriculum students cover when, simply that that will not *drive* assessment processes.



LEARNING INTERNSHIPS,  
INDIVIDUAL ASSESSMENT

The most important element of the education at a Big Picture Learning school is that students learn in the real world. The main component of every student's education is the Learning Through Internship/Interest. In this internship with an expert mentor in the field of the student's interest, the student completes an authentic project [...] Assessment criteria are individualized to each student based on the real world standards of the student's project (as gauged by the student's mentor). [...] public exhibitions ([...tracking] student growth and progress, quality of work, and academic depth), weekly check-in meetings with advisors, journals, yearly portfolios, and transcripts (which translate the Big Picture Learning design [for colleges]).



H A M P S H I R E C O L L E G E

PERSONALIZED, NARRATIVE  
DRIVEN EVALUATIONS

Hampshire College uses narrative evaluations instead of grades. Because the purpose of evaluation is to give students meaningful, constructive feedback, faculty members provide extensive written feedback on papers and projects. Detailed written evaluations reflect students' engagement and performance in courses, internships, field work, projects, study abroad, and other evaluated learning activities. Our narrative evaluation system eliminates competition among students, enhancing Hampshire's collaborative learning community. Both graduate schools and employers appreciate Hampshire's comprehensive narrative transcript, which offers a level of detail not reflected on traditional transcripts.

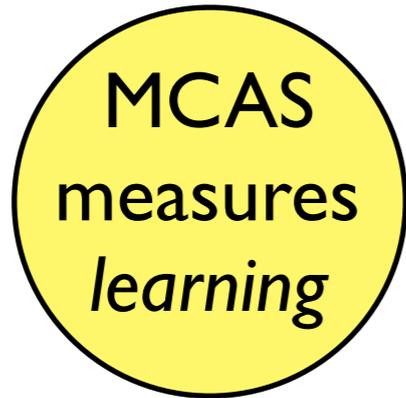
*At the core of Big Picture Learning's mission is a commitment to equity for all students, especially underserved urban students, and the expectation that these students can achieve success. Big Picture Learning designs innovative learning environments, researches and replicates new models for learning, and trains educators to serve as leaders in their schools and communities.*

*Hampshire students enjoy the freedom to create highly-personalized areas of study. [...] With a 12:1 student/faculty ratio and an average class size of 15 students, no other undergraduate college surpasses the level of faculty guidance and collaboration you'll experience at Hampshire. [...] Narrative evaluations are at the heart of Hampshire's educational philosophy. Our assessments of student work and progress are detailed, personalized and qualitative, and paint a far richer picture of the student than a grade-point average.*

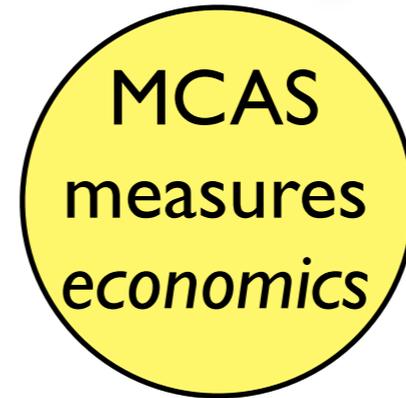
BEST CASE

reality?

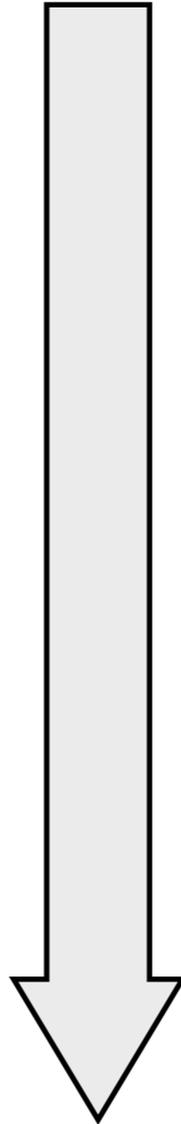
WORST CASE



*Deep projects consistently mapped back to the curriculum will result in higher test scores.*



*Structured test prep, firewalled from the primary curriculum, is required for MCAS success.*



**weekly diagnostic surfacing students needing prep.**  
**daily, volunteer-led MCAS prep sessions**  
**monthly testing skills workshops**  
**one week before MCAS devoted to test prep**

If MCAS measures real learning, we “simply” need to do a good job. If it’s just a test that tells you nothing about learning, you would have to prep for it exclusively. To avoid all the issues of ‘teaching to the test’ we are *completely separating* MCAS (and later, SAT) preparations from the rest of the curriculum.

Students--with the help of community mentors--will undergo ongoing diagnostic tests assessing MCAS readiness. This diagnostic will be paired with ongoing, small-group, targeted test prep.

This prevents staff from distorting their lesson plans to match the MCAS while insulating students from harmful stereotype threat and other effects which stem from being identified as a ‘failing’ student.

Even better, this means there will be time set aside for *test-taking as a skill*--a neglected and unfortunately essential part of many present & future academic experiences.

Overall, students will not spend more than 10% of their time prepping for the MCAS.



## DROP-IN VOLUNTEER SUPPORT, COMMUNITY

At least four days a week, 826 centers offer students one-on-one help with homework, regardless of subject. After homework is completed, students are encouraged to spend thirty minutes reading with their tutors, and a final hour is dedicated to writing. In the summer, many of our centers cater exclusively to English language learners. [...] We recognize that not all students can visit 826 centers personally, so our chapters also dispatch teams of volunteers to local public schools on a regular basis. Per teacher request, 826 sends volunteers into classrooms to provide one-on-one assistance to students tackling writing projects [of all kinds].



## EMPHASIZE TESTING SKILLS, WORKSHOP PREP

Have crosswalks to state-specific and Common Core State Standards, helping educators to understand what students are learning and how they are performing in the context of both the current state standards and the new Common Core State Standards [...] clear strategies on how to bridge the gap between what they know and their performance on a range of standardized test questions [...] Differentiate instruction through scaffolded learning and adaptive instruction [...] Kaplan customizes reading/language arts instruction for each student through a revolutionary online system that prescribes lessons based on individual learning needs.

826 National offers a variety of drop-in writing centers which aggressively leverage latent volunteer effort in the community to allow for 1:1 tutoring and support. In their own words:

*...a nonprofit organization that provides strategic leadership, administration, and other resources to ensure the success of its network of eight writing and tutoring centers. 826 centers offer a variety of inventive programs that provide under-resourced students, ages 6-18, with opportunities to explore their creativity and improve their writing skills.*

Kaplan is a nationally recognized test prep center and publisher. Their workshops, prep courses, and professional development options will serve as a model for the SSA's test-taking and test-prep support.

Rather than ignore testing and test prep, we think we should simply guard against its tendency to corrupt good learning communities and embrace it as a separate, masterable skill.

# OUTREACH ACTIVITIES

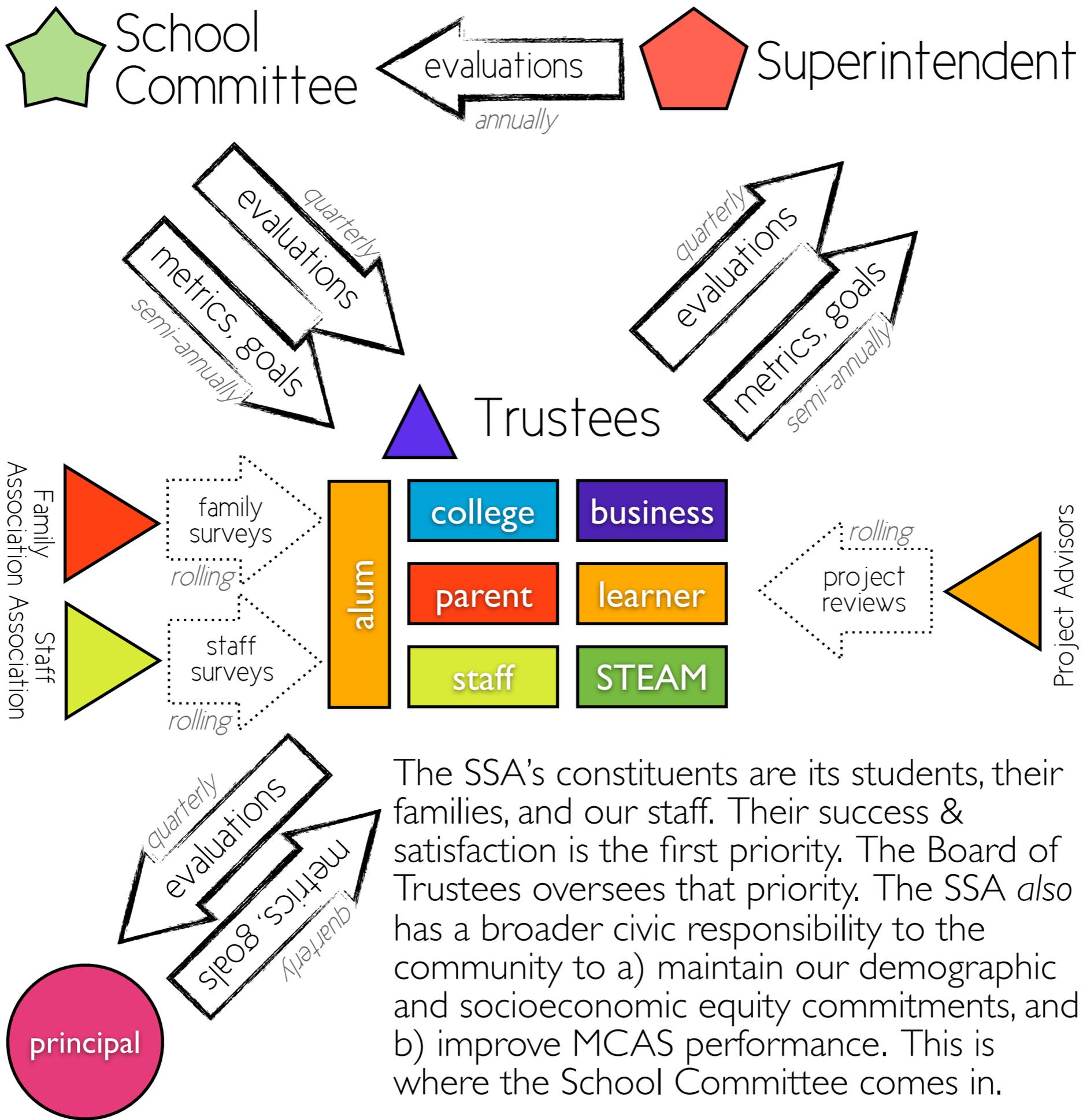
INDIVIDUAL ATTENTION PER PARTICIPANT



There are 331 8th graders in Somerville Public Schools. The SSA will build an ongoing outreach process that touches every single potential SSA student. We also want to be able to ramp up smoothly, setting up and trying out pieces of infrastructure as we go. We don't underestimate the logistical and design complexity of operating a school.

To accomplish both of these goals, we'll be putting together an enrollment outreach process with a variety of events at various time scales, ranging from one-off workshops to a free summer camp.

This ongoing enrollment outreach process will serve not only to give every student who might benefit from the SSA an authentic chance to make an informed decision about it, but will double as a sandbox where we can try out potential hires, develop and prototype curricula, and build our organizational and community capacity in informal contexts, giving back to the community at large in the process by providing free enrichment programming in the middle schools.



The SSA is responsible for exactly three things: 1) improving student's MCAS performance, 2) ensuring our civic & equity commitments are met and 3) satisfying student, staff, and family.

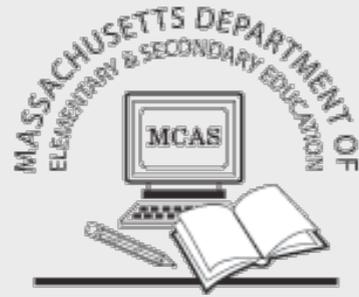
A Board of Trustees and Project Advisory Boards will provide our mission-motivated oversight, ensuring projects are deep, challenging, and that students are growing into the independent investigators the SSA set out to nurture. The School Committee will

The point of this governance structure is to ensure that if performance slips or if the SSA misses its equity goals, it will be shut down. We committed to those results, and if we are failing, we think the District should pull the plug, per the MGL:

*If the school committee determines, on the advice of the superintendent, that the school has substantially failed to meet multiple goals in the innovation plan, the school committee may: (i) limit 1 or more components of the innovation plan; (ii) suspend 1 or more components of the innovation plan; or (iii) terminate the authorization of the school...*

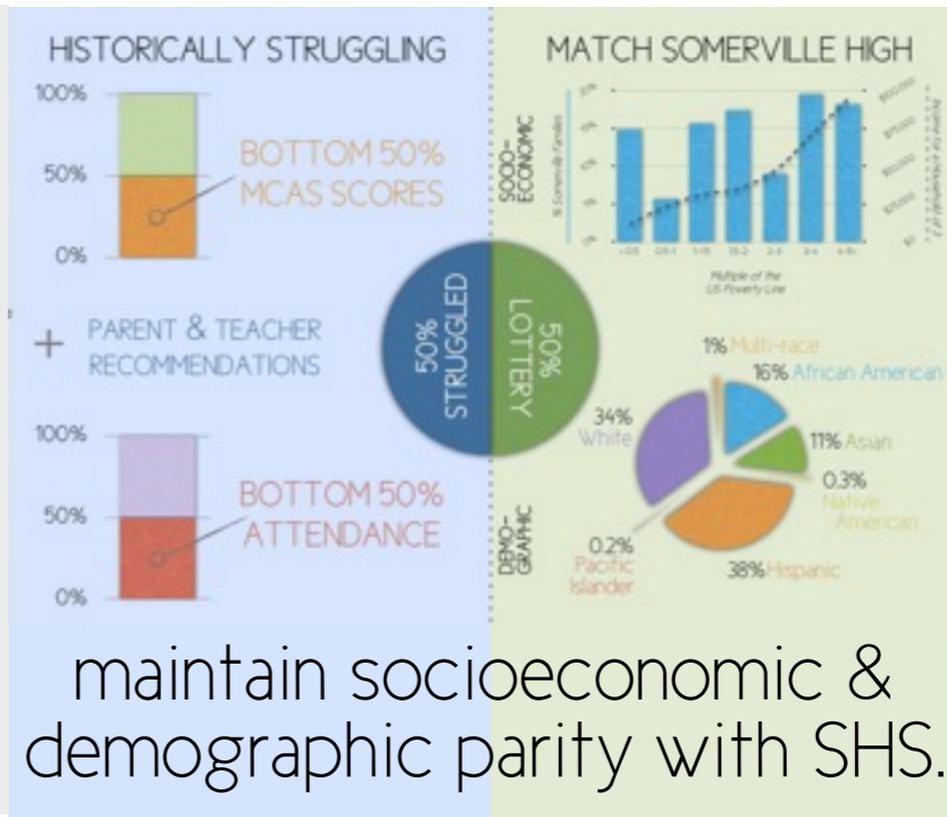
The SSA's constituents are its students, their families, and our staff. Their success & satisfaction is the first priority. The Board of Trustees oversees that priority. The SSA also has a broader civic responsibility to the community to a) maintain our demographic and socioeconomic equity commitments, and b) improve MCAS performance. This is where the School Committee comes in.

# THE SSA MUST...



Consistently hit its MCAS goals...

...which are set yearly by the Board of Trustees and approved by the School Committee



maintain socioeconomic & demographic parity with SHS.

# AND IF IT DOESN'T...

## MEET MCAS GOALS

- 2y in a row → Board of Trustees probation
- 3y in a row → Principalship parent referendum
- 5y in a row → Principalship SC referendum

## MEET EQUITY GOALS

- 2y in a row → Board of Trustees probation
- 3y in a row → Principalship SC referendum
- 5y in a row → Authorization SC referendum

Externally, the SSA is responsible for exactly three things: 1) improving student's MCAS performance, 2) ensuring our equity commitments are met (i.e. that the makeup of our student body reflects Somerville's high school students), and 3) maintaining student, staff, and family satisfaction.

While none of those are our mission--the point of the SSA is not to improve MCAS scores--those are the results we commit to and the measures the Superintendent & School Committee will judge us by.

A Board of Trustees and a Project Advisory Boards will provide our mission-motivated oversight, ensuring projects are deep, intellectual challenging, and that students are growing into the independent investigators the SSA sets out to nurture.

The motivating point of this governance structure is to ensure that if performance slips or if the SSA misses its equity goals, it will be shut down. We are committed to those results, and if we are failing, we think the District should have the option to pull the plug.



ADAM SWEETING (School Committee Member), MARCUS SANTOS (Grooversity & SPS), KAREN WOODS (SHS Science Department Chair), LEO DESIMONE (SHS CVTE Director)

ROB GREGORY (proprietor, Redbones), CHRIS ANGELLI (SHS Biotech), BAKHTIAR MIKHAK (MIT Media Lab, Media Modifications), LISA TATTERSON (Somerville parent)

CHRIS ROGERS (Director, Tufts Center for Engineering Education & Outreach), SHAUNALYNN DUFFY (co-founder, sprout & co.), JOHN OTERI (Headmaster, SHS)

The MGL lays out the Innovation Planning process:

1. *The applicant prepares a prospectus and submits it to the superintendent.*
2. *Within 30 days of receiving the prospectus, the superintendent convenes a screening committee: (i) the superintendent, (ii) a school committee member, and (iii) a representative of leadership from the local teachers' union.*
3. *Within 30 days of screening committee approval, the applicant creates the innovation plan committee, on which there can be no more than 11 members.*
4. *The innovation plan committee develops and approves the innovation plan.*
5. *Local stakeholders negotiate proposed waivers from or modifications to the collective bargaining agreement.*
6. *The school committee reviews the innovation plan and votes to authorize the establishment of the Innovation School.*

## WHAT DOES IT MEAN TO BE A “STRUGGLING” STUDENT?

It means at least one—or perhaps a combination—of the following: 1) A student scored in the bottom 50% of their most recent MCAS cohort as measured by CPI. 2) A student’s attendance rate has been below average the year prior to admission. 3) A student is recommended by a teacher or parent as exhibiting below-average academic performance and standing to benefit from the SSA’s approach.

## WHY IS THIS A VOCATIONAL SCHOOL?

A basic premise of the SSA is that computational tools can help translate traditionally academic subjects like math & science into the vocational and artistic paradigm. Given that the SSA’s computational focus will mean that students develop significant, marketable skills often addressed outside the traditional college track (e.g. software engineering, graphic design, etc.) and that a significant component of many students’ experience at the SSA will feature co-op and internship opportunities, it’s natural for us to take advantage of the increased curricular flexibility and industry connections made easier through the vocational school structure.

## WHAT'S WITH THE 'A' IN STEAM?

Art/Design. Traditional STEM—Science, Technology, Engineering, and Mathematics—it has become clear that the expressive and artistic aspects of the intellectual and economic landscape need a holistic approach. Traditional approaches to STEM content are limited by the tools and representations; e.g. the quadratic equation is intimately tied to the blackboard, pencil, and paper.

Computation both opens up new avenues to approaching old content as well as completely new content. A big piece of that is with the computer in hand, much of the traditional curricula can become immediately *useful*. And many of the uses we'll be exploring are exactly those artistic, musical, and expressive domains traditionally *cut* in favor of 'STEM.' Through new subjects like computational art, the SSA will be re-contextualizing traditional subjects in artistic & expressive work. We think this will both offer valuable, hands-on & project-based entry points to traditional subjects *and* serve broader needs for deeper design experiences for learners.

## WHERE WILL THE SSA BE LOCATED?

Given the tight integration we're proposing with Somerville High School, we'll ensure that the SSA is within walking distance of Somerville High School. The Massachusetts General Law defines this as 1.5 miles. We will be offering funded, alternative transportation options for folks as well.

## WHY 8-12TH GRADE?

For three reasons: 1) to offer families a chance to try the SSA out without affecting their children's transcripts in 9-12th grade and without giving up any SHS time; 2) to give the SSA a year to transition students from a traditional environment to a project-based one without wasting any of the time students might be productively placed in co-ops & internships; 3) to position the SSA to grow into the lower grades more easily.

On (3) it is reasonable to ask, "Why not begin in 6th? Why grow down instead of up?" There are many reasons for this, but the most significant is that we think it's essential we have a deeply project-based environment for students to *grow into*, especially since so much of what distinguishes the SSA at this point is its community integration and real world focus (both of which get more challenging for younger people).

## WILL THIS TAKE MONEY FROM SHS?

Yes, but it will *not* be leaving SHS with more work and less money. School budgeting is mostly driven by per capita figures. We are being very aggressive in giving money for centralized services that everyone in Somerville should share (e.g. Central Office) back to the District. Furthermore, we're paying a premium for any services we use of the District's (e.g. if SSA students cross-register at SHS). And on top of all of this, we are focused on working with those students who struggle with traditional options. Taken together, this means that the median Somerville High School teacher should *benefit* from this initiative (in terms of time and money available).

## WILL STAFF JOIN THE STA?

Yep! Or at least, by default, every employee will have the option to join the STA. It is illegal to force staff to join the STA.

## WHAT ABOUT *MOBY DICK*?

Or put more broadly: in a project-based school focused on STEAM, what happens to the classics and the humanities? Students' straight-up ELA coverage will be well-scaffolded by their work documenting, presenting, and analyzing their work. At places like High Tech High and Expeditionary Learning schools, this path is well-worn.

But, there's plenty of "the canon" to which students at SSA will not be exposed. We think that's OK. Just as many students are led to believe they aren't "math people" because of their experiences in math class, many are led to believe that literature and art and poetry "aren't for them" because of their experiences in humanities classes. We don't claim to know how to unlock *Moby Dick* through computation, but we know that deep considerations of, e.g., what it means for something to be alive—accommodate cybernetics and robotics and philosophy and literature with ease. And it's through the articulation and pursuit of these deep questions that both philosophy and robotics will find themselves in the classroom.

We've been putting this proposal together with the help of community input and critique over the course of a year. Hundreds of meetings and people-hours have slowly made the plan what it is. The more people who lend a hand, the better this will be for Somerville.

So get in touch!

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`http://somervilleesa.org`

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WWW