Student Summary

Guided by its Mission, the SYA mathematics courses combine in-class and online learning activities in a hybrid learning environment, with a focus on helping students build their independent-learning skills as an integral part of learning mathematics. Students are expected to complete preparatory online activities outside of and prior to class, in order to be prepared to actively engage in mathematical problem solving and collaboration in the classroom. This approach to learning mathematics is quite different from the traditional instructor-led, lecture-based approach to which many incoming SYA students are accustomed.

Student Expectations

The following general expectations apply to all SYA mathematics classes.

- **Student Independence & Preparation:** Students are expected to complete online activities and review course content prior to arriving to class and be prepared to actively participate in mathematical discussions and problem solving during class. Teachers minimize, or eliminate entirely, lecture time and shift the focus to resolving open issues and supporting students “doing math.” This expectation is often a challenge for students early in the year. Teachers will work with students during orientation and course start-up to help prepare them to be successful working in this environment.

  The **Student Best Practices - Managing Work in an SYA Math Class** document provides suggestions to help students organize and manage their work in an SYA mathematics course.

- **Collaboration:** Students are encouraged to work together on mathematics and to interact to develop a deeper understanding of mathematics. This expectation applies to both in-class and online activity. The unit test is the only activity that students are required to complete independently -- without collaboration. Ultimately, all students are expected to develop a personal understanding of the course content, and all work submitted for the course must be their own.

- **Classroom Environment:** Students typically attend their math class four days per week; however, the primary focus during this time is not on teacher lectures or working through example problems, but rather on student engagement in mathematics, with a focus on developing an understanding of key mathematical concepts, procedures and problem solving through active collaboration -- utilizing teacher support as needed. Frequently, class periods will include students from different courses working collaboratively in a
SYA Mathematics - Course Expectations (for Students)

“math space” -- a class environment dedicated to students actively working on a diverse scope of mathematics.

- **Online Content**: All course content is available electronically and can be accessed online via the Canvas Learning Management System or other Internet-based tools (for example, Khan Academy, Desmos and YouTube).

- **Online Communication**: Outside of the classroom, students and teachers actively participate in cross-campus, shared online communication using Slack. The Slack math channels are the primary communication tool outside of school. Consistent, quality participation in the online community is encouraged.

**Course Structure & Grading**

Each of the SYA math courses is structured around the four core activities listed below with the grade weighting indicated in parentheses (% of overall grade weighting).

1. Warmups (10%)
2. Written Problems (10%)
3. Online Problems (30%)
4. Unit Tests (50%)

**NOTE**: The first three activities (warmup, written problems and the online problems) comprise 50% of the overall course grade. These activities can be completed collaboratively, including asking for teacher support, and have no time limit other than the final submission deadline. Students typically have 2-4 days to complete these activities. Good time management practices, active collaboration and asking for help should allow students to perform well in these areas and to prepare for the unit tests.

**Warmups (10%)**

Introductory Khan Academy (KA) activities are completed outside of class as “warmup” activities for each new lesson and must be completed prior to class. The primary purpose of the warmup activities is to introduce students to the basics of new topics and to prepare them to actively and productively engage in the in-class activities. Collaboration on warmup activities is encouraged.

**Written Problems (10%)**

Written problems are the traditional written “homework” that many teachers and students are accustomed to in a mathematics course. The written problems are focused on more challenging, multi-step/concept problems that require the full engagement of students. Repetitive exercises (replication of the examples from the lessons) are kept to a minimum as
these are effectively addressed in the warmup activities. Collaboration on written problems is encouraged.

Online Problems (30%)

Online problems are included as the final activity for each lesson. Each online problem set focuses on the current lesson, but also includes problems related to content from prior lessons, as well as prior math courses to facilitate ongoing student review of mathematics. Each online problem set can be submitted up to two times; there is no time limit except for the final submission deadline, and the highest grade will be retained. Collaboration on online problems is encouraged.

Unit Tests (50%)

There is a unit test at the completion of each major topic in the course. Tests are individual, in-class, proctored activities with a time limit. Tests are generally structured to include problems in the following three categories below with the approximate percent of test given:

- Core Problems (Basic): 70%
- Multi-concept Problems (Intermediate): 20%
- Challenge Problems (Advanced): 10%

The math test correction policy allows students to recover up to 30% of the points missed on a test.

There are no trimester or end-of-year exams except for the AP Calculus mock exam which is counted as a single test grade.

Independent Learning Skills

In addition to learning mathematics, an expected outcome of the SYA approach to mathematics instruction is to help students grow as independent learners\(^1\) -- a lifelong skill that can be applied across disciplines. Some of the key attributes that students will exhibit/build include:

- **Curiosity** – Independent learners want to find out more about the world. They seek out ways to explore. They learn from various angles and formats, not just traditional instruction. They are proactive and find ways to access additional lesson supplements on their own.

- **Self-motivation** – Intrinsic motivation far surpasses any prize or reward system. Independent learners are motivated by setting internal goals to achieve. They are driven by their own personal achievement.

\(^1\) Based on [http://www.aoacademy.com/7-characteristics-of-independent-learners](http://www.aoacademy.com/7-characteristics-of-independent-learners)
• **Self-examination** – Where have you been and where are you going? Independent learners know how to evaluate themselves. They can see their strengths and weaknesses. They strive for measurable progress and often chart their accomplishments and failures.

• **Accountability** – Accountability means knowing what you have to do and doing it without anyone telling you to. The sooner a student becomes responsible for consequences, the less dependent he will be on outside sources for discipline or motivation.

• **Critical thinking** – Independent learners think critically of a situation. They examine all possibilities and often come up with multiple solutions. They don't just memorize. Rather they ask "Why?" and formulate answers based on observation and intelligent deduction.

• **Comprehension with little or no instruction** – Independent learners have an uncanny ability to read, visualize, or kinesthetically instruct themselves. No matter the topic or subject studied, an independent learner will find ways to understand material through application (generally trial-and-error).

• **Persistence** – Independent learners don't give up. They strive to understand a concept as much as possible on their own before asking for help. They also apply self-discipline in finding answers to a problem. They teach themselves and generally only ask questions after failure to find a solution on their own.