

*MASSACHUSETTS ACADEMY
OF
MATHEMATICS AND SCIENCE*



*SENIOR INDEPENDENT STUDY
PROJECT
2018 - 2019*

Senior Independent Study Project Description

The Senior Independent Study Project (SISP) provides an opportunity to acquire knowledge that is *new to the student* outside of the traditional classroom-based curriculum. The SISP also provides an occasion for students to improve their life-long learning skills. Overall, the SISP provides Academy students further opportunity to practice critical thinking and problem solving in an independent learning situation.

Students may choose one of three pathways to meet the requirements of their SISP:

- I. **A student may investigate a new area of special interest** with the approval of and under the supervision of an Academy advisor and with the assistance of a qualified mentor. Successful projects in the past include art, dance, music and writing projects, physical training, new language acquisition, theatre directing, and EMT training. The proposal must have demonstrable goals and learning outcomes, must prove new learning, and must be challenging in nature. Proposals will require the identification of and consultation with a qualified mentor, participation in a class, and/or lessons as part of fulfilling the requirement.
- II. **A student can participate in new research**, extension of a research project, or interning in a laboratory, with an outcome after the 100 hours to include publication and/or the research being entered into a competition, or a public presentation including a review or judging.
- III. **A student can plan and execute a service learning project**. Service learning is more “project-based,” where there is a design phase, an implementation phase with set goals, and an evaluation phase at the end to measure whether the goals and learning objectives were met. Service learning usually begins by studying a community need to identify a worthwhile project. The goal of service learning is to understand the social problem that creates the situation and how to better work to create the solution. Examples could be creating a traveling science show program (including the design of lessons) and bringing it to local middle and elementary schools. This could be a team project.

Each student (or student team) will present the results of his/her learning to the Academy community during April of the senior year. The SISP is a required, graded course at the Academy. It is recorded on the transcript.

TIMELINES

There are several checkpoints and products designed to aid the student in developing, undertaking, and evaluating the SISP.

1. By **May 14**, the student must submit a one-page, printed narrative proposal to the faculty Advisor (see below for proposal guidelines). *The proposal must be signed by a parent/guardian.* The advisor will review the proposal, discuss it with other faculty during a staff meeting, ask for revisions if necessary, and, upon receipt of acceptable modifications, approve the project.
2. Prior to commencing work on the project, or no later than **August 23rd**, the student must submit a timeline for the SISP to the Advisor. This will be used to determine the feasibility of completing the project.
3. By **one week after timeline submission**, the student must submit an Assistance Agreement Form. The form will show that the student has secured the help of one or more qualified mentors.
4. During the course of the project, the student must complete three (3) checkpoint forms, one at approximately 33 hours (33% completion) and one at approximately 66 hours (66% completion), and a third showing completion of their hours.
5. On **April 19th**, the student will present the results of their projects.
6. By **May 2**, the student will submit the Final Reflection Paper and documentation binder.

Requirements for successful completion of the SISP

A binder containing:

- An approved Project Proposal (*signed by a parent/guardian*)
- A Timeline for the work to be accomplished throughout the year
- A Journal documenting progress (with weekly/bi-weekly entries)
 - This could include pictures, lab journal entries, video journal
- A signed Assistance Agreement Form
- A Project Presentation/Exhibition
- A Final Reflection Paper
- 3 completed Checkpoint forms

All submitted documents are to be word-processed (with the exception of your Journal entries). These documents must be in your binder when you submit it in May.

Project Proposal Guidelines

A Senior Project Proposal addresses the following questions:

Focus. What is your special interest?

Intent. What is the new knowledge, attitude, and/or skills that you expect to gain from the project? Why will these make it an interesting and worthwhile project for you to undertake?

Prior Knowledge. What knowledge, habit of mind, skill, and need do you bring to this project?

Methods of Inquiry. How will you investigate your special interest and make good on your intent? Who will you ask to help you, either through advice, observation or apprenticeship? What specific resources will be needed? What challenges do you expect?

Evidence of Learning. What will be your evidence of success or change?

SAMPLE PROPOSAL

Focus. To become a fully trained volunteer firefighter

Intent. Firefighting is not only about putting out fires. The training involved in becoming a firefighter includes emergency medical training, open water rescue, automotive accident response, and fire prevention. The fire department provides the opportunity for positive interaction with the community. Another component of firefighting is fire education. The company visits schools in the local towns and offers workshops for citizens.

Prior Knowledge. My years in Boy Scouts have given me some background skills in basic first aid, CPR, and knot tying. I have also held leadership positions, and learned teamwork, both essential in firefighting.

Methods of Inquiry. I already know a fair amount about being a volunteer firefighter, since my father was a volunteer firefighter for many years. I have already visited my town's fire department website and have scheduled an appointment with our fire chief to gather more information.

Evidence of Learning. All recruit firefighters are required to attend the Massachusetts Fire District 7 Recruit Training program, which I will enroll in. The program consists of all aspects of basic firefighting. It culminates with Massachusetts Fire Training Council Firefighter I/II certification. The remaining portion of the year will be attending training sessions with the local department, and answering calls.

Assistance/Mentor Procedure

One of the requirements of your Senior Independent Study Project is to obtain assistance from a qualified person in your area of interest. This assistance may be in the form of a mentor, a teacher, an interview, or some other form of personal interaction in your quest for new knowledge. The following pages are for your use when you make the initial contact. When you go for assistance (ask for a person to mentor you, etc.) take 1) the Letter of Introduction, 2) your Project Proposal, and 3) a copy of the Agreement Form with you. Ask the person to read the Letter and your Proposal and then sign a copy of the Agreement Form, should they agree to assist you. You will need to follow this procedure for each person who assists you in a significant way, so make several copies of the Agreement Form. It is your responsibility to keep the signed Agreement Forms in your binder.



Letter of Introduction

Senior Independent Study Project

Dear Sir or Madam:

The bearer of this letter is a student at the Massachusetts Academy of Mathematics and Science at WPI, and is showing the letter to you because you may be able to help. Let me say a little about the project, and how you may be of assistance.

The purpose of the project is to provide opportunities for Academy students to learn from experiences that usually do not take place in the traditional school curriculum. To do this, students choose topics or activities that greatly interest them, develop a proposal with help from an Academy teacher, and then develop a plan to achieve their stated goals and objectives over the course of the school year. As part of the learning, students must seek advice and help from individuals who are knowledgeable and experienced in the chosen area of interest. The final result, whether written or performed, demonstrates what new knowledge the students have gained and how it was acquired. Regardless of content, it is expected that the students' SISIP experience will enhance life-long learning skills. The SISIP (Senior Independent Study Project) is required for graduation.

In the past, projects have ranged from artistic creations to work-internships, EMT training, preparation for the Boston marathon, computer animation, acquiring a new language, and ballroom dance. Expert advisers like you have made key contributions by providing advice, giving contacts, making available space in labs, studios, or workshops, demonstrating techniques and skills, and giving valuable feedback on written summaries or performances. Many advisors have noted that they have gained from as well as given to these independent studies. To help you assess whether you can help, a copy of the student's proposal is attached. If you would like further information about the project or the Academy in general, please do not hesitate to call me at 508-831-5859.

On behalf of our students, I appreciate your attention to this invitation and hope that you may be able to help. Thank you very much.

Sincerely,

Michael Barney
Director
Mass Academy of Math and Science

Agreement Form



I have read the Letter of Introduction and the Project Proposal and I agree to assist

_____ with his/her Senior Independent Study Project.

student's name

signature

printed name

phone number/email

date

Final Reflection Expectations

The Final Reflection is an opportunity for you to reflect upon the work you have accomplished on your SISP. It should be a two-page paper to include (but not limited to):

- A report on the progress you have made toward meeting your S.M.A.R.T. goals
- A self-assessment of your work to date.

Review your goal setting process. Be S.M.A.R.T.

S – Specific

When setting a goal, be specific about what you want to accomplish.

M – Measurable

What metrics are you going to use to determine if you meet the goal? This makes a goal more tangible because it provides a way to measure progress. If it's a project that's going to take a few months to complete, then set some milestones by considering specific tasks to accomplish.

A – Achievable

This focuses on how important a goal is to you and what you can do to make it attainable and may require developing new skills and changing attitudes. The goal is meant to inspire motivation, not discouragement. Think about how to accomplish the goal and if you have the tools/skills needed. If you don't currently possess those tools/skills, consider what it would take to attain them.

R – Relevant

Relevance refers focusing on something that makes sense with the broader goals. For example, if the goal is to launch a new website, it should be something that's in alignment with the overall project objectives, not ancillary material that doesn't support what you are trying to accomplish..

T – Time-Bound

Anyone can set goals, but if it lacks realistic timing, chances are you're not going to succeed. Providing a target date for deliverables is imperative. Ask specific questions about the goal deadline and what can be accomplished within that time period. If the goal will take three months to complete, it's useful to define what should be achieved half-way through the process. Providing time constraints also creates a sense of urgency.

Genuine new knowledge requires an on-going process of revision and reevaluation. You must continually go back to previous steps to incorporate new information and results. This process is a loop which cycles back on itself and requires you to use each step a number of times, not necessarily in any particular order, to come to your final conclusions.

Because this is a written presentation, the following standards for written excellence are required. Distinguished writing must:

- Establish and maintain a clear purpose and focus
- Be organized from beginning to end
- Demonstrate a logical progression of ideas, and be coherent
- Supply pertinent, explicit details, and provide ideas/information in depth
- Consider audience and purpose
- Have few or no errors present
- Show clear evidence that the directions in the SISP packet were followed

This paper examines the entire process of your project, including the presentation. In writing your reflection, keep in mind the following guideposts for this learning experience.

- What have you discovered about your ability to plan?
- How have you learned to use resources?
- How have you learned to solve problems?
- How do you intend to use the knowledge and skills you have gained?
- What have you discovered about your own thinking?
- What have you learned to value about yourself through this process?

While we offer you these guideposts, remember to integrate and synthesize as you offer insight and reflection in writing, rather than simply listing your responses.

Presentation Expectations

The SISP presentation is your opportunity to exhibit your new knowledge in a professional manner. You will have fifteen minutes to present and five minutes for questions and answers.

Presentation Preparation Checklist

- Check presentation time
- Download presentation to Dropbox/ Thumbdrive
- Rehearse (meet time constraints)
- Visual aids
- Professional attire
- Test technology

Presentation Scoring Rubric

Scoring Key

3	<i>Exceeds expectations</i>
2	<i>Meets expectations</i>
1	<i>Fails to meet expectations</i>
0	<i>Not Done</i>

Mechanics of Presentation

_____The speaker utilized effective mechanics of presentation through vocal variety, emphasis of key points, clarity of speech, humor, eye contact, pace, and rhythm.

Knowledge of Content

_____The speaker demonstrated mastery of content of his/her material/subject.

_____The speaker answered questions from the audience in an informed and confident manner.

Support Materials

_____The speaker's appropriate use of supporting materials enhance the project/presentation and are effectively referenced and utilized.

_____The speaker's supporting materials meet high standards of excellence (craftsmanship, design, and creativity).

Time Management

_____The speaker utilized his/her time effectively.

Professionalism

_____The speaker displayed an appropriate tone and professional style of dress.

Final Reflection Paper Rubric

Scoring Key

3	<i>Exceeds expectations</i>
2	<i>Meets expectations</i>
1	<i>Fails to meet expectations</i>
0	<i>Not Done</i>

REFLECTION

Content _____

- Focuses on guideline questions

Self-assessment _____

- Shows evidence of thoughtful self-assessment

WRITTEN PRESENTATION

Organization _____

- Includes a well-developed introduction, body, and conclusion
- Demonstrates proper paragraphing and effective transitions
- Contains a logical progression of ideas

Usage/Style _____

- Establishes an appropriate tone/shows awareness of audience
- Shows clear evidence of proofreading/proper format is used
- No errors in grammar and usage

Final Grade Breakdown

The final grade for the SISP is based on the following five categories.

Binder/Journal:

You will be graded on how well you follow the process of working toward completion of your SISP. This grade will reflect the outcomes of your meetings with your advisor; the comments recorded by anyone assisting you; the quality and consistency of the entries in your binder/journal, and how well you met the given deadlines.

Presentation:

You will be graded according to the Presentation Scoring Rubric included in this packet.

Final Reflection Paper

You will be graded according to the Final Reflection Paper Scoring Rubric included in this packet.

Adherence to Deadlines:

You will be graded on how consistently you met the published deadlines.

You will be graded on the quality of the final product, your ability to clearly demonstrate your acquisition of new knowledge, and your depth of understanding of this new knowledge. The faculty advisor will determine the project grade after the final deadline.

Final Grade Scoring Rubric

Notebook/Journal

Meetings	Proposal	Timeline	Assistance Agreement	Organization	Content
Comments					

Presentation

Mechanics of Presentation	Knowledge of Content	Support Materials	Time Management
Comments			

Final Reflection Paper

Reflection		Written Presentation	
Content	Self-assessment	Organization	Usage/Style
Comments			

Adherence to Deadlines

Notebook/Journal	Mid-Project Reflection	Summary Paper	Final Reflection Paper
Comment:	Comment:	Comment:	Comment: