



Academic Enrichment Center

Community. Identity. Excellence



## ACES 2019 Summer Enrichment Courses

### ACES 2019 暑期课外加强提高课程介绍

#### Important Dates

- ❖ Feb. 12<sup>th</sup> – ACES 2019 Summer Enrichment Program Enrollment Starts
- ❖ April 15<sup>th</sup> – Early Registration Discount Ends
- ❖ June 3<sup>rd</sup> – Classes begin
- ❖ June 10<sup>th</sup> – SAT Intensive Workshop Begins
- ❖ Aug. 9<sup>th</sup> – The last day of ACES 2019 Summer Enrichment Courses



## **ACES 2019 Summer Academic Enrichment Course Descriptions**

The 2018-2019 school year will be over soon. Many families are busy in planning their summer vacations and kids' summer activities. ACES Academic Enrichment Center offers a variety of academic enrichment Courses and standard test preparation workshops this summer. We created brief course descriptions for all of the courses offered in this summer. Based on student ages and areas of developments, the camps are divided into 6 categories for easy browsing.

- ❖ SAT/PAST Test Prep Courses
- ❖ 4th – 5th Graders - English Enrichment and Public Speaking/Debate Camps
- ❖ 6th – 7th Graders - English Enrichment and Public Speaking/Debate Camps
- ❖ 7th – 8th Graders - English Enrichment and Public Speaking/Debate Camps
- ❖ Elementary and Middle School Half-Day Competition Math Camp
- ❖ STEM Courses – Physics, Chemistry, Biology and Computer Programming Camps

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## **SAT/PSAT Test Preparations**

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### **SAT Foundation Reading/Writing**

ACES SAT Foundations provides a first entry-point for students interested in preparing for the SAT test. The course covers the structure of the test, including question types and scoring. The course also covers general test-taking strategies, managing test panic, increasing confidence and speed as well as development of a personal plan-of-action for test preparation. The course also includes a crash-course in English grammar and reading skills, and fundamental writing and argumentation skills needed to write the SAT essay. Practice with real, timed SAT test sections is an integral part of the course.

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### **SAT Foundation Math**

ACES SAT Foundations provides a first entry-point for students interested in preparing for the SAT test. The course covers the structure of the test, including question types and scoring. The course also covers general test-taking strategies, managing test panic, increasing confidence and speed as well as development of a personal plan-of-action for test preparation. A review of test content includes basic math, algebra, geometry, data analysis, statistics, and probability. Practice with real, timed SAT test sections is an integral part of the course.

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### **SAT/PSAT Intensive Workshop**

As we all had our own wealth of experience in preparing for college admission tests, we well understood how important a role intensive training plays. In fact, our children are not aiming for the “standard” score: we are overachievers. Traditional SAT courses offer lectures to teach students the test strategies, which is very important. However, after the students have mastered these strategies, they need to increase their familiarity with the test as well as their speed.

The SAT/PSAT Intensive workshops provide ample preparation for these very important college admissions test. These 4-week workshops are offered during the summer for 7 hours on Monday through Friday, where class periods are equally divided between lecture and lessons, practice tests, and review of those practice problems.

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## English Enrichment and Public Speaking/Debate Camps for 4th-5th Graders

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### Elementary Grammar – Level I and II Analysis (4th - 5th Graders)

ACES Grammar utilizes the gifted and talented program from Royal Fireworks Press for its foundation. Grammar is taught through four different levels of analyses: parts of speech, parts of sentences, phrases and clauses, and sentence types. Students will study each level of the analyses. Students will move from written and visual analysis of sentences to mental analysis making grammar clear, concise, and easy to grasp.

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### Creative Writing – Tales Around World (4<sup>th</sup>-5<sup>th</sup> Graders)

ACES Creative Writing – Tales Around World serves as an introduction to creative writing using the six traits<sup>1</sup> by exploring fairy tales, fables, and other fantastic stories from around the world as a model for completing a written narrative. Students will engage in daily prompts and undertake various exercises to stimulate the imagination and hone writing skills. By the end of the course, student will complete a multi-page, polished, short story narrative.

1 The six traits are ideas and content, organization, voice, fluency, word choice, and grammar conventions. <https://iew.com/help-support/resources/articles/6-traits-iew>

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### Fundamentals of Grammar, Vocabulary and Editing (4th-5th Graders)

In a world where it is becoming more important than ever to communicate effectively, this course gives students the opportunity to improve on their writing skills and deepen their overall understanding of the English language. Through written assignments in class, students will learn how to properly use grammar in their writing and everyday communications, will learn how to edit their own work as well as the works of others, and will become better writers in the process. The daily lesson plan will introduce a new word list, which students will use to expand their vocabulary and incorporate into their writing assignments.

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### Introduction to Public Speaking (4th - 5th Graders)

Confidence, body language, and motion control are all necessary skills for any intermediate public speaker. Through public speaking and oral interpretation, students will be given the opportunity to finely hone these skills through repeated practices of extemporaneous and impromptu speaking. Students will also learn about different speaking styles in terms of a person's setting (professional speech, newsroom speech, political speech, etc.). By the end of this course, students should have the ability to speak confidently on an array of political issues, all while maintaining good body language and motion control.

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### Creative Writing – Funny Tales (4th-5th Graders)

ACES Creative Writing – Funny Tales serves as an introduction to creative writing using the six traits<sup>1</sup> by exploring tall tales, trickster tales, and other humorous stories from around the world as a model for completing a written narrative. Students will engage in daily prompts and undertake various exercises to stimulate the imagination and hone writing skills. By the end of the course, student will complete a multi-page, polished, short story narrative.

1 The six traits are ideas and content, organization, voice, fluency, word choice, and grammar conventions. <https://iew.com/help-support/resources/articles/6-traits-iew>

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### **Non-fiction Reading: *National Geographic* and Memoirs (4th - 5th Graders)**

Children like to read fiction because fiction tends to be more plot-driven and generally easier to follow. However, reading nonfiction helps develop vocabulary and research skills, adds to a student's background knowledge in a variety of subjects, and teaches them how to critically evaluate sources of information. Studies show that nonfiction reading promotes student success (*Education Leadership* Vol 70.4).

This course will be an introductory course to encourage students to gain nonfiction reading skills and to read nonfiction beyond the classroom. The course will focus primarily on reading science articles from *National Geographic* and excerpts from memoirs.

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### **Elementary Grammar – Level III and IV Analysis (4th - 5th Graders)**

ACES Grammar Level III and IV Analysis is a continuation of Level I and II Analysis. Grammar is the foundation for punctuation, writing, and vocabulary usage. Grammar is taught through four different levels of analyses: parts of speech, parts of sentences, phrases and clauses, and sentence types. Students will study each of the four levels of analyses through more complex and rigorous sentences and texts. Students will move from written and visual analysis of sentences to mental analysis making grammar clear, concise, and easy to grasp.

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### **Beginner Public Speaking/Debate (4th - 5th Graders)**

In order to speak in public with confidence, students must first face their fear of public speaking in front of an audience. Intro to Public Speaking and Debate teaches students not only foundational public speaking and debate skills, but also skills, tips, and tricks that will make them more confident public speakers altogether. In this class, students will learn the basics for writing speeches, creating outlines, and making proper eye contact and body motion. Upon completion of this course, students will be able to make basic short speeches with confidence, and students will have developed their skills in speech writing, enunciation, and speech delivery.

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### **Fundamentals of Critical Reading (4th - 5th Graders)**

The purpose of "Fundamentals of Critical Reading" is to transform students from passive readers -- those who simply read the words on the page without thinking -- to active readers who are thoroughly engaged with the work they are reading. Through learning how to identify the main point of passages, examining the implications thereof, and recalling the sequence of events, students not only improve their reading comprehension but gain skills that will be crucial for their success on future SAT and ACT testing. In reading from a variety of sources, students will learn to become more discerning readers, learning how to analyze the motivations of news articles as well as understanding the feelings and intentions of fictional characters.

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### **Basic formats of composition (4th - 5th Graders)**

There are many creative ways to write, but for many elementary school beginners in writing, the most common difficulty is how to start and how to complete a whole article. They hope there is a standard template for them to follow to build their confidence. This course will teach students the basics on how to write various forms of composition and the important things to take note of. This course will teach students the basic structure for basic types of composition, how to plan their

composition, and the basic principles needed to write their first paragraph, problems, resolutions, and conclusion. Besides the basics of composition, the course will also help students to work on avoiding grammatical mistakes, varying sentence structure, and using the right vocabulary in different contexts.

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### **Introduction of Five-Paragraph Essay (4th - 5th Graders)**

In this course, students will be introduced to the basics of effective writing where they will develop skills that will be crucial for their later academic careers.

This course will emphasize writing a clear, coherent, more in depth and focused multi-paragraph essay. A review of the parts of an essay will be addressed as well as practice in drafting, outlining, and editing/revision. Students will hone their techniques in establishing an engaging and appropriate introduction including a strong thesis statement, a supporting body with relevant evidence, and a strong conclusion that ties the essay all together. A review of grammar rules, flow, style, and usage will be addressed. Research strategies will also be included to bolster and practice using evidence to further strengthen and mature the students writing and critical thinking abilities. This class will benefit students and serve as a foundation for writing in their future academic courses and writing portions of standardized tests.



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## **English Enrichment and Public Speaking/Debate (5<sup>th</sup>-6<sup>th</sup> Graders)**

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### **Vocabulary Foundation (5<sup>th</sup>-6<sup>th</sup> Graders)**

Enhance students' vocabulary and enable them to understand new words quickly and efficiently. Root words, prefixes, and suffixes are the keys to unlocking the meanings of English words. In Vocabulary Foundations, students develop the tools to master new vocabulary words through an analysis of component root words, prefixes, and suffixes. Students learn the historical significance of the Latin, Greek, and French influence on the English language. Upon completion of the course, students will not only have mastered a large number of vocabulary words essential for their academic success, they will also have gained an intellectual framework useful for understanding unfamiliar vocabulary with much greater speed and facility. In other words, students will be able quickly to deduce the meanings of many new words based on an analysis of their morphology, i.e., their component roots and affixes.

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### **Intermediate Public Speaking (5<sup>th</sup>-6<sup>th</sup> Graders)**

Emotional expression, vocal projection, and audience engagement are all critical skills for any effective public speaker, and in Intermediate Public Speaking, students will develop their abilities as speakers to convey their emotions appropriately, to project loudly, and to engage the audience in both a friendly and assertive manner.

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### **Foundations of Academic Writing (5<sup>th</sup>-6<sup>th</sup> Graders)**

ACES Foundations of Academic Writing helps students learn foundational components needed to create an expository essay including building a strong thesis statement and an analytical body paragraph structure. Emphasis will be placed on understanding of form, idea, style, mechanics, and voice needed for effective communication in a variety of writing through short essay prompts. Students will also learn to organize their ideas effectively and strategically incorporate quotations from a source text into their compositions. By the end of the course, the students will be able to write short essays with increased confidence and credibility. This class serves as a basis for various forms of nonfiction academic writing for assignments such as science research papers and reports, history essays, and literary analyses.

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### **Creative Writing – Hero Journey or Mystery (5<sup>th</sup>-6<sup>th</sup> Graders)**

ACES creative writing - hero journey or mystery explores the hero's journey or mystery as a model for completing a written narrative. Using the six traits<sup>1</sup> of writing, students will recognize elements of excellent writing. In addition, students will study examples of the hero's journey or mystery in order to better understand the trope or genre. Students will engage in daily prompts to stimulate the imagination and undertake various exercises in word choice and sentence fluency to hone writing skills. By the end of the course, students will complete a multi-page, polished, short story narrative.

<sup>1</sup> The six traits are ideas and content, organization, voice, fluency, word choice, and grammar conventions. <https://iew.com/help-support/resources/articles/6-traits-iew>

### **Descriptive and Informative Writing (5<sup>th</sup>-6<sup>th</sup> Graders)**

In this class students will learn to convey information accurately in writing. We will discuss common grammatical errors and strategies to address them when editing sentences, paragraphs, and short essays. Students will focus on devoting time and attention to each individual step of the writing process so that they may present their ideas in an organized, interesting manner. Students will also analyze examples of informative articles to gain a better understanding of the differences in style between different disciplines. By the end of the course, students will be able to write short essays with increased clarity and credibility.

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### **Intermediate Debate (5<sup>th</sup>-6<sup>th</sup> Graders)**

Now that students have hopefully gotten over all of their public speaking fears, students can begin bettering their arguments, reasoning, and persuasive skills. In this class, students will be tasked with preparing speeches for student congress and public forum. Through practicing these debate forms, students will learn how to make persuasive arguments. Furthermore, through practicing both congress and public forum, students will improve their ability to speak for larger periods of time, they will improve their research abilities, and they will learn how to make speeches while under competitive pressure. Upon completion of this course, students will have developed a number of essential debate skills, such as flowing, recognizing logical fallacies, and making offensive and defensive arguments. By the end of the course, students will be able to confidently and professionally compete at a novice/junior varsity debate level.

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### **Critical Reading: Close Reading, Logical Analysis, and Evidence Finding - Level I (5<sup>th</sup>-6<sup>th</sup> Graders)**

ACES Critical Reading: Close Reading, Logical Analysis, and Evidence Finding – Level I hones students' critical responses to different genres of literature most commonly encountered in academic settings and on state-wide and national exams. Students will learn and practice close reading by looking beyond the surface-level or plot of a text and into its connotations and themes. Students will also learn how to logically analyze texts in a variety of genres in order to make established arguments and support those arguments with evidence found in the texts themselves. Students will practice several styles of annotating passages as they study not only what a passage says but *how* that passage presents its subject matter. Students will also identify the purpose of a passage, its intended audience, the tone of the author, and the implications a text may have. By the end of the course students will be more engaged as they read and, as a result, improve their overall critical thinking and analytical skills.

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### **Personal Narrative Writing (5<sup>th</sup>-6<sup>th</sup> Graders)**

ACES Personal Narrative Writing allows students to work on their own story telling capabilities, specifically those related to their own personal stories. Personal narratives focus more on plot, storytelling, and writing about your own experiences. While learning the fundamentals of personal narratives, students will not only gain experience writing nonfiction, they will gain a better understanding of the narratives they read and study in school. By the end of the course, the students will have a longer, well-written and developed personal narrative.

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### **Critical and Current Events Reading (5<sup>th</sup>-6<sup>th</sup> Graders)**

In this class students will learn techniques to develop their critical reading skills above and beyond surface-level comprehension of a text. We will read, discuss, and analyze a variety of informational and argumentative articles on current events. Students will practice annotating passages. They will also identify the article's purpose, intended audience, tone, and implications. Additionally, students will learn to discuss current social, cultural, and political issues fairly and responsibly. By the end of the course, students will be more engaged as they read and gain a better understanding of the issues and innovations being discussed in the present moment.

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### **Speed Reading (5<sup>th</sup>-6<sup>th</sup> Graders)**

In this course, students will learn strategies to read actively so that their overall comprehension of a complex passage increases. Learning to “speed read” is a counterintuitive process: by paying closer attention *while* reading, and knowing what to look for, the reading process overall is more substantive and speedy. Students will practice annotation techniques while analyzing and discussing a variety of texts—literary, informative, and persuasive. Students will learn and practice strategies such as searching for key words, reading for topic sentences, using the pointer or tracker method, and scanning, previewing, and skimming. In addition to learning to read faster, these skills also help students with retention of the material read, and students gain critical thinking and analyzing skills as these speed reading techniques require them to sift through information and take in what's most important.

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### **Perfecting Grammar, Style, and Flow (5<sup>th</sup>-6<sup>th</sup> Graders)**

Students will build a solid foundation in grammar, style, and mechanics they need in order to develop a thorough understanding of syntax, readily identify parts of speech, and avoid common grammatical mistakes. The grammar section of this course is specifically geared toward concepts frequently tested on the multiple-choice writing section on both the SAT and ACT. This style section focuses on developing student's skills in writing SAT style argumentative essays which include how to write a strong thesis statement with supporting evidence. By learning these concepts, the students will be able to improve the overall quality of their writing by breaking down the components of the essay and then learning how to tie them together coherently especially under a time constraint.

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## **English Enrichment and Public Speaking/Debate Camps (6th-8th Graders)**

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### **The Persuasive Essay (6th - 8th Graders)**

ACES Persuasive Essay Writing serves as an introduction to argumentative writing, centered on an opinion. Students will learn the rhetorical triangle and gain techniques for strengthening stylistic devices and the structures of well-written sentence. Students will complete deductive and inductive arguments.

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### **Advanced Public Speaking**

In order for students to truly master public speaking, they must be able to speak confidently on serious issues, they must be able to entertain the audience and keep their attention, and they must be able to persuade the audience. In Advanced Public Speaking, students will be tasked with giving long and tasking speeches in order to improve their emotional expression, their ability to entertain, and ultimately their ability to persuade audience members.

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### **Advanced Academic Writing (6th - 8th Graders)**

ACES Advanced Academic Writing explores components needed to create a well-argued and well-supported essay including building a strong thesis statement and an analytical body paragraph structure. Emphasis will be place on the understanding of organization, form, idea, style, voice, and the mechanics needed for effective communication in a writing long essay. Students will also learn to research and how to incorporate that research into their papers in order to effectively bolster their arguments. This class serves as a basis for various forms of nonfiction academic writing for assignments such as science research papers and reports, history essays, and literary analyses. In Advanced Academic Writing, students will be expected to write longer essays containing a more in-depth analysis and read more complex and rigorous research and texts to use as evidence for their theses.

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### **Advanced Vocabulary- Hard SAT Words (6th - 8th Graders)**

The ACES Advanced Vocabulary class provides an intensive study of difficult words that often appear on standardized tests such as the SAT. We will discuss a variety of techniques for learning vocabulary that engages multiple learning styles to maximize retention of challenging words. We will also learn common roots of words, which will help students understand the meaning of words they do not necessarily know. Students will read passages from history, literature, and the sciences as we study these difficult terms in context. Through writing, speaking, and listening activities, students will build the vocabulary skills that are essential to success on both the Critical Reading and Essay measures of the SAT.

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### **Personal Essay Writing (6th - 8th Graders)**

ACES Personal Essay Writing serves as foundation course for college-entrance essay writing and explores components needed to create a reflective essay, an essay in which the writer examines his or her experiences in life. Students will write about those experiences, exploring how he or she has changed, developed, or grown from those experiences while understanding audience. While personal narratives focus more on plot and storytelling, personal essays tend to be more self-reflective and analytical. Students will write more about themselves and their character, focusing on the *why* behind the story instead of the how an event took place. Personal essay writing helps students become better analytical and critical thinkers, examining their own life experiences in the process.

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### **Critical Reading: Close Reading, Logical Analysis, and Evidence Finding – Level II (6th - 8th Graders)**

ACES Critical Reading: Close Reading, Logical Analysis, and Evidence Finding – Level II, a more advanced version of Critical Reading Level I, hones students' critical responses to different genres of literature most commonly encountered in academic settings and on state-wide and national exams. Students will practice close reading by looking beyond the surface-level or plot of a text and into its connotations and themes in more advanced and more different to discern texts. Students will also learn how to analyze texts in a variety of genres in order to make established arguments and support those arguments with evidence found in the texts themselves. Students will practice several styles of annotating passages as they study not only what a passage says but *how* that passage presents its subject matter. Students will also identify the purpose of a passage, its intended audience, the tone of the author, and the implications a text may have. By the end of the course students will be more engaged as they read and, as a result, continue to improve their overall critical thinking and analytical skills especially those associated with higher-level texts.

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### **SAT/ACT Essay Writing (6th - 8th Graders)**

SAT/ACT Essay writing will focus on the fundamentals for writing a strong essay on test day. Students will gain practice writing essays, reading various persuasive essays, and learning how to manage time and stress during the essay portion of the test. Students will study the different aspects of a rhetorical analysis, learn how to debate persuasively using the perspectives of others to back up their own claims. Students will practice using real ACT/SAT essay prompts.

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### **Advance Middle School Debate (6th -8th Graders)**

Speech economy, flow, and moral, policy, and legal argumentation are the final skills every good debater needs to master. In Advanced Argumentation and Debate, students will have the ability to hone these skills by participating in the most challenging debate event: policy debate. Students will be tasked with developing their speech economy, their flow, and their speed reading abilities. By the completion of this course, students still be able to make moral, policy, and legal arguments comfortably.

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### **Advanced SAT/ACT Reading and Grammar (6th - 8th Graders)**

ACES Advanced SAT/ACT Reading and Grammar hones students' critical responses to different genres of literature most commonly encountered on the SAT and ACT: history and social sciences, literature, and science. Students will acquire the skill set of effective critical readers and identify the purpose of a passage, its intended audience, the tone of the author, and the implications a text may have. By the end of the course students will be more engaged as they read and, as a result, improve their overall comprehension of the text.

In addition to reading section skills, this class will also focus on the grammatical rules typically associated with the English section of the ACT or the Writing and Language section of the SAT in addition to other skills featured in the tests such as organization and order, conciseness, and cohesion. By the end of the course, students should feel more comfortable and be better prepared for the Reading and Grammar based sections of the SAT/ACT.

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### **Advance Critical Reading – Classic Reading and Style (6th - 8th Graders)**

In Advanced Critical Reading – Classic Reading and Style, students build on the skills acquired in Critical Reading Level II. Not only will students continue to learn the reading techniques that will be useful for scoring well on the SAT and ACT English sections, but they will also begin to engage in a meta-analysis of the texts that they are reading. Students will come to understand that authors are influenced by their historical, personal, and economic circumstances, which all combine to have a substantial effect on their writings. Through taking such an analytical approach, students will improve the depth of their thinking and gain skills that will be essential for writing college-level papers. By focusing primarily on more advanced reading materials, specifically some of the classic literature they will be expected to read later in their academic careers (such as excerpts from epics like *The Odyssey*, Shakespeare plays, poetry, and novels such as those by authors like Charles Dickens, Jane Austen, and Ernest Hemingway), students gain more experience close reading and analyzing difficult texts. This course challenges students to think outside the box about texts they have probably heard of before and to identify fallacies in argument so as to become better, more analytical thinkers and stronger, more persuasive writers.

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### **English Grammar and Sentence Style (6th - 8th Graders)**

ACES English Grammar utilizes Don Kilgallon's *Sentence Composing for High School*, where students are given the opportunity to mirror the style of literary greats and see the *how* and *why* behind grammar rules. Students will complete various writing exercises to increase mastery of sentence style. Throughout the course, students will learn how to compose better sentences and varying sentences using tools learned in class.

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## Elementary and Middle School Half-Day Math Camp

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### Competition Math for elementary and middle school students

ACES Competition Math is designed for rising 3<sup>rd</sup> through 8<sup>th</sup> grade for the following purposes:

1. Introduce the students the world of competition math and the joy of mathematics.
2. Help improve student problem solving skills, exploration of mathematical knowledge, and improvement of analytical skills.
3. Help students improve their performance in math competitions, as well as their general mathematical skills if math competition is not their main goal.

The competition math courses will give interesting math puzzles to students for increasing students' interest and improving students' motivation. For each level's completion math problems, instructors will categorize problems into different problem types and work on each type of problem step by step. The curriculum and the material are derived from various math contests such as Math Kangaroo, Math Olympiad for Elementary and Middle Schools, Math League, CML, MathCounts, AMC 8, etc.

The courses are designed with 4 levels that are 2<sup>nd</sup>-3<sup>rd</sup>, 3<sup>rd</sup>-4<sup>th</sup>, 4<sup>th</sup>-5<sup>th</sup> and 5<sup>th</sup>-7<sup>th</sup>. Each level of competition math has two units. Each unit is a week-long half-day camp. For a given level, the two units will cover different contents so that a student can register for one unit or both units for his/her level.

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## Physics, Chemistry, Biology, and Computer Programming Camps

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### ACES Physics I

ACES Physics program designed to provide a platform for the students maximize their potential, dig out their talents in Physics, and pave the road for students who like to participate F=ma competitions. Another main objective is to help students get a head start and make their jobs easier when they take Physics class at their schools.

ACES Physics I focuses on kinematics:

- Kinematics – relations of distance, speed, acceleration and time
- Free falls, ballistic pendulum, and projectile motion
- Centripetal acceleration
- Math - trigonometry

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### ACES Physics II

ACES Physics program designed to provide a platform for the students maximize their potential, dig out their talents in Physics, and pave the road for students who like to participate F=MA competitions. Another main objective is to help students get a head start and make their jobs easier when they take Physics class at their schools.

ACES Physics II focuses on Dynamics:

- Newton's law of motion
- Momentum and conservation of momentum
- Energy and conservation of energy
- Friction and the inclined plane

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### ACES Physics III

ACES Physics III is designed for students who have completed "ACES Physics II" or students who have taken high school physics class and are ready to take the F=ma exam. The focus of ACES Physics III is *burning*, which burns the concepts and problem-solving skills into students' brains so that they can quickly and correctly solve F=ma problems.

The course reviews all of mechanics to prepare students to take the F=ma exam and reexamines that material to find shortcuts to solve those problems now that the students have a better understanding of the topics.

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### ACES Chemistry I

Pre-AP Chemistry will be one of the hardest courses in high school. Many students struggle with the course because it is the first time they have ever had to apply mathematics to real-world problem-solving situations, including the practical use of Algebra. It is also a course that requires a great deal of abstract thinking, visualization in three dimensions, and the use of logical and critical thinking skills. Pre-AP Chemistry gives students the background and skills to prepare them for more advanced science classes, such as AP Chemistry, AP Environmental Science, and/or AP Biology.

ACES Chemistry I and II are designed as preview classes of high school Pre-AP Chemistry and are designed to help students overcome steep learning curves in Pre-AP Chemistry.



These classes will introduce students to the foundations of chemistry involving matter and its characteristics as related to structure, organization, classification, and interactions. This is a rigorous and quantitative course that allows students to investigate, analyze, and summarize chemical reactions, molecular behaviors, and the uses of chemical substances.

ACES Chemistry I will cover the following topics:

- Measurement and Calculations - Atomic Structure - Periodic table and periodic law - Bonding and chemical formulas - Chemical equations and reactions - Stoichiometry

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## **ACES Chemistry II**

ACES Chemistry II is the continuation of the ACES Chemistry I.

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These classes will introduce students to the foundations of chemistry involving matter and its characteristics as related to structure, organization, classification, and interactions. This is a rigorous and quantitative course that allows students to investigate, analyze, and summarize chemical reactions, molecular behaviors, and the uses of chemical substances.

ACES Chemistry II will cover the following topics:

- States of matter - Gas Laws - Solutions – Thermochemistry - Acids and bases - Reaction Kinetics - General Equilibrium

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## **ACES Biology I**

ACES Biology I and II will cover Pre-AP high school Biology curriculum. The Biology I and II courses are designed as introduction and review courses of high school Pre-AP courses of the same subjects. They will be helpful for students to climb the steep initial learning curve and better manage their high school GPAs.

Biology is the study of living organisms, their origins, how they survive, reproduce, change over time, and interact with each other and their environments. The Pre-AP Biology courses are introductory, and their primary objective is to provide students with a fundamental understanding of biology and scientific processes, building a foundation for success in the college level AP courses to follow. Course material is roughly divided as follows: 35% molecules and cells, 35% evolution and genetics, and 30% organisms and populations. The nature of science will be taught throughout the course.

ACES Biology I will cover the following topics.

- Biochemistry: carbon compounds, chemical reactions, and enzymes - Cell biology: structure, function, energy, growth, and division - Genetics: inheritance, DNA, RNA, protein synthesis, and genetic engineering - Biological evolution and classification

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## ACES Biology II

ACES Biology II is the continuation of the ACES Biology I. ACES Biology I and II will cover Pre-AP high school Biology curriculum. The Biology I and II courses are designed as introduction and review courses of high school Pre-AP courses of the same subjects. They will be helpful for students to climb the steep initial learning curve and better manage their high school GPAs.

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ACES Biology II will cover the following topics.

- Ecology: energy and matter, ecosystems, interactions, and human influence - Microbiology: bacteria, viruses, protists, and fungi - Plants: structure, function, reproduction, and response - Animals: systems, homeostasis, and behavior

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## ACES Scratch Programming (3rd - 5th Graders)

Scratch Camp is the perfect opportunity for elementary students to practice and improve critical thinking and problem-solving skills. Not everyone will grow up to be a programmer, but everyone can benefit from the problem-solving experience that computer programming provides. **Scratch** is used as the introductory **programming language** because its creation of interesting programs is relatively easy and skills learned can be applied to other **programming languages** such as Python and Java.

This summer, we will be using Scratch to learn about programming fundamentals, 2D sprite-based animation, the Cartesian coordinate system, variables, algorithms, program design, and debugging. The curriculum will base on “**Creative Computing Curriculum**” **developed by the Harvard Graduate School of Education**. We will begin by working on templates and tutorials to develop a greater understanding of computer programming. Students will then have the opportunity to design, write, and improve some of their own Scratch programs. We will be using curriculum designed to allow students of any experience level to improve their programming skills this summer.

ACES Scratch Programming Courses are designed for rising 3<sup>rd</sup> through 5<sup>th</sup> graders for the following purposes:

1. Introduce the students to the world of computer programming and the joy of coding experiences.
2. Introduce the core fundamentals of computer programming.
3. Builds student imagination, creativity, and confidence

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## ACES Scratch Beginner I (No programming experience required) (3rd - 5th Graders)

What is covered:

- Use Scratch to create and share programs
- Understand motions and events
- Learn about (x,y) coordinates
- Use and create sounds

- Create variables and use variables to track data such as the score in a game
  - Control the flow of program by using if-else statements
  - Program using arithmetic operators
  - Iterate and repeat code using loops
  - Design and animate sprites
  - Boolean logic (true/false)
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### **ACES Scratch Beginner II (3rd - 5th Graders)**

What is covered:

- Quick recap of Scratch I
- Algorithms – using a step by step process to solve a problem
- Diving deep into computational logic
- Design – explore making plans before starting work and then trying to follow them
- Design and developing a storyboard
- Fundamentals of game development
- Drawing on Scratch using mathematics and applying coordinates math to games and animations.

At the end of the course, students create their own computer game and share their project with their instructor and classmates.

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### **ACES Scratch Beginner – Intermediate (3rd - 5th Graders)**

Intermediate Scratch Programming guides students through challenging concepts in Scratch Programming. Building on their foundation of Scratch programming, students will be able to create intricate animations and games using complex logic and program design.

What is covered:

- Deeper exploration of Boolean logic and Basics of Boolean Algebra using AND, OR, and NOT.
  - More advanced looping techniques using **wait until**, **repeat until**, etc.
  - Blocks creation (Reusing code): defining a block, creating custom blocks, and passing data to blocks
  - Deeper exploration of the Cartesian x-y coordinate system and its role in computer graphics
  - Create Music in Scratch
  - Graphics concepts in the paint editor
  - Introduction to recursion
  - Project design from start to finish
  - Critical thinking and problem solving
  - Debugging skills – syntax errors and logic errors
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### **ACES Java I**

The course will cover (1) the Java basics such as data types, variables, functions/methods, logical/relation/assignment operations, if-else statements, for-and-while-loops; (2) important classes in java.lang such as String, Integer, Long, and Character; (3) online browsing, reading and understanding java docs/API; (4) important classes in java.io such as FileReader, FileWriter, BufferedReader, PrintWriter, and StringTokenizer in java.util.

After successfully completing the Java I course, students should be able to read data from an input file, parse data elements inside the input file, manipulate the input data elements, and write the results based on the problem statements to an output file.

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### **ACES Java II**

The Java II course is the continuation of the Java I course. We assume students have successfully taken the Java I course or passed the Java I placement test. The Java II course will continue to explore the Java language and fundamentals including (1) introducing array, array operation, and two-dimensional array; (2) more Java statements and operators which are not covered in Java I such as branching statements, “?” operator and bitwise operators, binary representations and ASCII values; (3) introducing functions/methods and recursions; (4) briefly discussing class, inheritance, encapsulation, and object-oriented programming concept; (5) understanding Java exception handling; and (6) USACO Bronze problem case study - using the knowledge and skills learned from the Java I and Java II to solve real USACO Bronze level problems.

After successfully completing the Java II course, students will have the Java language foundations to create Java applications which can solve real problems of mathematics, modeling, computation, and USA computing Olympiad.

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### **ACES Python I**

The Python I is a beginner’s Python programming class. We assume that the students have no previous knowledge of Python language and any other programming languages. The course will cover (1) the Python basics – language syntax; (2) the Python basics - data types and operators: variables, arithmetic operators, logical operators, and assignment operators; (3) the Python basic – control and loops: if else statements, for-and-while-loops; (4) understanding important built-in data types: string and list; (5) becoming familiar with important Python built-in functions and defining user functions; (6) online browsing, reading and understanding Python docs/API; and (7) basic file input/output functions available in Python such as open, close, read, write.

After successfully completing the Python I course, students should be able to write simple Python script to perform computational and data processing tasks including reading data from an input file, parsing data elements inside the input file, manipulating the input data elements, and writing the results based on the problem statements to an output file.

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### **ACES Python II**

The Python II course is the continuation of the Python I course. We assume students have successfully taken the Python I course or passed the Python I placement test. The Python II course will continue to explore the Python language and fundamentals including (1) more Python data types such as Dictionaries and Tuples; (2) introducing Python class and briefly discussing class, inheritance, modules and object-oriented programming concepts; (3) understanding Python exception handling; and (4) starting to build some simple Python apps. The simple applications will help students in practicing what they learned from the class, in becoming comfortable to use Python in their day-to-day school tasks, and in inspiring their interest in programming.

After successfully completing the Python II course, students will have the Python language foundations to create Python applications that can solve some real problems of mathematics, modeling, computation, and even USA computing Olympiad.

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### **ACES Basic Algorithms & Data Structure**

The Data Structures & Algorithms course is the continuation of the ACES Java I and Java II course. We assume students have successfully taken the Java II course or passed the Java II placement test. The course will use Java as teaching language. The Data Structures & Algorithms course will cover common data structures such as list, linked list, stack, queue, tree, hash table, and hash map. It will introduce the implementation and usages of those common data structures in java.util collections. We will teach different sort and search algorithms in general. Java build-in sort and search method and its applications will also be discussed in detail. We will also introduce algorithm complexity analysis and Big O notation so that students can solve their problems within time and space restrictions.

After successfully completing the Data Structures & Algorithms course, students will have the Java language foundations and Data Structures & Algorithms knowledge to create Java applications which can solve real problems of mathematics, modeling, computation, and USA computing Olympiad silver level problems.

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### **USACO Preparation**

This is USACO competition training course. Our competition training will use past competition questions and questions from our extensive resources.

USACO training teacher for this class will be a high ranking USACO competitor. The training will cover 1.) getting familiar with USACO judging system platform, 2.) strategies and methods of analyzing USACO problems, 3.) common algorithms and approaches for solving certain problems; and 4.) dos-and-don'ts in code and performance optimizations.