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## February 2019

### 9<sup>th</sup> – ACT and ACT plus Writing

Juniors – Begin your college search

Juniors – Map out dates and prepare for spring SAT and/or ACT exams

Seniors – Contact colleges to be sure your applications are complete. Send mid-year grades if required. Update colleges with any new information that might affect admission

## March 2019

### 9<sup>th</sup> – SAT and SAT plus Writing

(register by 2/8 - late registration 2/27)

9<sup>th</sup>, 10<sup>th</sup> and 11<sup>th</sup> grade students - Make plans for a productive summer. Investigate summer programs, jobs, internships

11<sup>th</sup> grade students – Create an initial list of colleges

Prepare for spring SAT/ACT exams

## SAT vs ACT—Which Should You Take?

The ACT and the SAT are nationally-recognized standardized tests, required for graduation by some school systems and by many colleges for admission. All colleges accept scores from both testing programs and, therefore, students are free to choose whichever suits them the best. Some colleges even make scholarship decisions using admitted students' test results. Historically, the two exams have been quite different in format and content. More recently, however, the College Board woke up to the reality that the ACT system far outpaced them in global popularity, motivating them to go through a significant overhaul and creating a new (and improved?) format in 2016. Ironically, this redesign made the SAT more similar to the ACT than ever before. So how do they really compare?

Both have similar sections that appear in a specific order; both offer an optional essay whose score is not included with the total score (check your likely colleges' essay requirements); and neither have any guessing penalty. The ACT takes nearly three hours without the Writing and 3 hours 35 minutes with; the SAT lasts 3 hours or 3 hours 50 minutes with the Essay. The ACT costs \$46 without the Writing and \$62.50 with; the SAT costs \$47.50 without the Essay and \$64.50 if taken with the Essay. The ACT is scored from 1-36 and the SAT score range is from 400-1600.

And now some more specific details about the differences:

### **MATH:**

The SAT offers more time for you to complete each question within all sections of the test. The SAT Math Calculator section allows nearly 30 seconds more per ques-

tion, so if you hate being rushed, especially in math, the SAT might be a better choice. If, however, you struggle to solve math problems without a calculator, the ACT could be a better option, but if you are confident in your calculations and can work quickly, go for the SAT.

Both the ACT and SAT Math sections emphasize algebra; ACT Math is comprised of 35%-45% geometry, while in the SAT Math section it comprises only 10%. The ACT also tests matrices, graphs of trigonometry functions, and logarithms. If you are solid in algebra and data analysis, the SAT is a good choice, but for trig functions and geometry, consider the ACT. The SAT also provides you with math formulas while the ACT does not. On the ACT, Math counts for 1/4 of your total score. On the SAT it counts for 1/2 of your score. This means that a lower math score on the ACT won't impact your overall score as much as a low SAT math score.

Both have many multiple choice Math questions but the ACT gives 5 possible answers, the SAT only offers 4 - a bonus for those who need to make an educated guess.

### **SCIENCE:**

The ACT has a Science section, whereas the SAT has none. You will find a science-based reading passage on the SAT as well as scientific graphs and tables in the math section, but if you love science, the ACT might be a better choice.

### **READING:**

Questions that require careful analysis of a text are required far more on the SAT than on the ACT. Responses emphasize evidence gleaned from the provided text. ACT Reading questions are always unrelated to one another.

(continued p. 3)

## Career Paths for Astrophysics Majors

- Aerospace worker
- Computer programmer
- Government researcher
- Observational astronomer
- Planetarium director
- Museum director
- Professor
- Physics teacher
- Entrepreneur
- Astrophysicist
- Software developer

For more information, check out the Physics Career Resources website at <https://www.compadre.org/careers/information/student/>



## Focus on Majors: Astrophysics

Students strong in math and science with a passion for the universe may be interested in considering a major in astrophysics. Astrophysics is a theoretical branch of astronomy. The major emphasizes the laws of physics and how they apply to the formation of planets, galaxies and universes. Majors study the evolution and behaviors of space from its creation to the present.

Astrophysics and astronomy are similar, and they are sometimes considered synonymous. However, astronomy focuses more on observation and the collection of data about the stars, planets, and related phenomena. Astrophysics focuses more on the physical processes of space. It emphasizes the origin and future of the universe. While astronomers are interested in the motion and position of celestial bodies, astrophysicists focus on the properties of these objects.

Some colleges do not differentiate between astronomy and astrophysics; they simply use astrophysics as a course or concentration in the study of astronomy. Others consider the two to be separate majors. In those cases, a student who prefers working with equations over observing through a telescope would fit the model for an astrophysics major.

The major is heavy in math and science, especially in the first two years of study. Students will apply calculus and advanced physics to the universe and the behaviors of its components. In order to apply this level of math and science, students will be expected to take several advanced classes in both throughout the study of the major.

Since this is the case, students looking to go into astrophysics should take four years of math and science in high school. It is recommended that they be familiar with at least precalculus, and preferably with calculus before college.

Majors spend a lot of time in labs doing research and completing projects. The subject of projects may be theoretical or observational, and projects could focus on a specific planet or cover a wide expanse of space. No matter the focus, projects often target current problems in the world

of astrophysics.

Most programs stress projects, both solo and in groups. Research projects usually require extensive time in an astronomy lab as well as the use of computers. Computers may be used for theoretical modeling, data analysis, or telescope observations. Because of the frequent use of computers, one of the skills astrophysics majors require is an aptitude for computers.

In addition to computer skills, majors gain abilities in data analysis, critical and spatial thinking, math, and physics. They develop teamwork and research skills, independence, and both verbal and written communication skills.

These skills can be applied in a variety of technical jobs in the fields of aeronautics, space, and computer science.

Most jobs in astrophysics require a PhD, but there are options outside of a doctorate.

Students may become professors, astrophysicists, science teachers, or software developers. Professors will conduct research as well as teach. They will have more fixed schedules than astrophysicists, who are often free to work from home and plan their own schedules. Software developers will use the computer skills learned in the study of the major to produce research tools and programs. All of these professions require a PhD, except for high school science teachers and lower level researchers.

Majors can also work for the government or transnational space agencies like NASA. They may help design, plan and coordinate missions to space. They may design the new instruments and software that aid in research and observation. Some job titles include quality inspector (of technology and programs), research engineer, field service technician, and associate faculty member.

Astrophysics majors often aid in preparation for space missions. However, majors are not limited to preparation only. Some astrophysics students have gone on to become astronauts themselves.

## Financial Matters: Tax Benefits for Education



Tax credits may be available to parents who pay higher education costs for their dependents. An education credit helps with the cost of higher education by reducing the amount of tax owed on your tax return. If the credit reduces your tax to less than zero, you may get a refund. There are two education credits currently available: the [American Opportunity Tax Credit](#) and the [Lifetime Learning Credit](#).

The **American Opportunity Tax Credit (AOTC)** is:

- Worth a maximum benefit up to \$2,500 per eligible student.
- Only available for the first four years of post-high school study at an eligible educational or vocational school.
- For students pursuing a degree or

other recognized education credential.

- Partially refundable. Eligible taxpayers can get up to \$1,000 of the credit as a refund, even if they do not owe any tax.
- Income limits. The credit is available to taxpayers whose modified adjusted gross income is \$80,000 or less (\$160,000 or less for joint filers). The credit is reduced if a taxpayer's modified adjusted gross income exceeds those amounts. A taxpayer whose modified adjusted gross income is greater than \$90,000 (\$180,000 for joint filers) cannot claim any of the credit.
- To claim the credit—Determine your eligibility and claim the credit by filling out [IRS Form 8863](#). You must provide the educational institution's employer identification number (EIN) on your Form 8863. You should also file form [1098-T](#), which should be received early in the year from your educational institution.

The **Lifetime Learning Credit (LLC)** is:

- Worth up to \$2,000 per tax return, per year, no matter how many students qualify.
- Available for all years of postsecondary education and for courses to acquire or improve job skills.
- Available for an unlimited number of tax years.
- Non-refundable. You cannot get a refund if you owe zero tax.
- Income limits. A taxpayer whose modified adjusted gross income is \$56,000 or less (\$112,000 or less for joint filers) in 2018 can claim the credit for the qualified expenses on a tax return. The credit is reduced if a taxpayer's modified adjusted gross income exceeds those amounts. A taxpayer whose modified adjusted gross income is greater than \$66,000 (\$132,000 for joint filers) cannot claim the credit. These limits are indexed to inflation and change annually.
- To claim the credit – Determine your eligibility, and fill out [IRS Form 8863](#).

## SAT vs ACT—Which Should You Take? (continued from p. 1)

The SAT Reading questions follow a clear chronological order relative to the provided text. ACT Reading questions are in random order. For some, this makes the SAT Reading questions much easier to follow and answer, and can often save you time.

### ESSAY:

Both tests offer one single optional essay. The SAT requires you to read a text and provide an analysis of the author's argument, using evidence from

the text and offering reasoning in support. Your opinion is not requested.

The ACT asks you to read a short text about a specific issue and then provide an analytical opinion of the views expressed. Your opinion is valued in your response. If you have strong reading and comprehension skills, you might well prefer the SAT. Those skilled in comparing and contrasting different viewpoints, and who possess some solid personal opinions, might find the

ACT better suited to their skills.

How do you choose which is best for you? Take both tests under standard test conditions! There are many concordance tables now online that you can use to analyze your results in order to determine which suits you the best. Then practice, practice, and practice some more. Your results may or may not be perfect, but your best efforts will always be rewarded with great results.



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## Dare to Be Different

If I could give every family only one piece of advice about college admission and the college application process it would be this: *Dare to be different.*

**Be different from the beginning** – don't wait like so many other people until the summer after junior year or, even worse, the fall of senior year to begin this process. Starting early will alleviate much of the stress that you might be witnessing in senior friends who are crunching to create lists, visit schools, write essays and complete applications.

**Be different in how you prepare your college list** – don't assume a college is a great fit until you've done your due-diligence. Stretch yourself to consider colleges beyond the "usual suspects." Colleges read all the applications from each high school together. That means they are comparing students from the same high school with the same measuring stick. The understanding is that you've all had the same opportunity to take the same classes over your high school career. If hundreds of students are applying to a college from your high school and the rigor of your coursework and your test scores don't measure up to the competition, it's obviously going to be more challenging to be accepted. However, if you are one of a handful of

students applying to a certain college, your credentials will still be compared, but your leadership or special talents may carry more weight.

**Be different in the activities you choose** – don't join the Spanish Club if the only reason you want to be there is to celebrate Cinco de Mayo. Follow your interests, not your friends. Find something, almost anything, that matters to you - something you care about. It could be tutoring, the environment, Boy Scouts, dance, writing a blog, starting your own business, etc., but participate for the right reasons. Your activities should tell a story about who you are and what you care about. Make them meaningful.

**Be different in what you choose to write about** – your essay is your best opportunity to set yourself apart in the application. It is the one area where you maintain total control. It can be a powerful tool, so use it wisely. Don't write what you think college admission officers want to read; write what you want them to know about you. Brainstorming your essay topic is a soul-searching process. Stay away from cliché topics that anyone could write and identify something that is uniquely you.