



# summerprogram in mathematical problemsolving

A PROGRAM OF THE AOPS FOUNDATION

## SPMPS Alumni Newsletter

April/May, 2015

### The College Issue



*Above, SPMPS 10th and 11th graders learn about the financial aid process while, below, 8th graders discuss how to prepare for high school.*

On Saturday, March 14, SPMPS held our first ever College Day, a valuable opportunity for alumni in grades 8, 9, 10, and 11 to hear about college and make plans for how to get in and be successful. Whether you were there or not, please also review the "Planning Ahead for College Admissions" document that we distributed that day.

College Day began with a panel of college students, all of them former SPMPS summer counselors. You can hear advice from Ayinde, Christian, Mahrukh, and Matt on the next page.

After the panel, Kevin Hudson presented about how you apply to college. You can read his advice inside on page 3.

Then, we held breakout sessions where students could talk about what to do next. Here's some advice on what you can be doing at this point so you are on track for college:

- **8th graders:** Get ready for high school! It will be different than middle school. It's important to work hard when you start high school and do all your homework. This way, you will adjust to a harder school.
- **9th graders:** Figure out what you enjoy doing! This might be classes or it might be clubs, sports, or activities. Try things out and spend time doing what you love. Then, stick with those things even when they are hard.
- **10th graders:** Prepare the timeline for when you plan to take the SAT and SAT 2 subject tests. If you are taking any AP classes, you may want to take the subject tests this June. Use the SPMPS "Planning Ahead for College Admissions" document to make your plan, or come to Office Hours and

speak to us.

- **11th graders:** First, schedule and take your SATs if you have not done so already. Second, start planning your college essay. You should write it this summer, but you want to plan carefully before you start. Come to Office Hours for advice on how to start.

At the end, Renee Council presented on financial aid for college. Here's the big lesson: do not let money be the reason you don't apply to a good college. **There are many sources of financial aid and colleges will make college affordable for amazing students like you.**

By the way, we didn't forget that 3/14/15 was a very special day: Pi Day! We made sure to serve pizza pies for snack.



# Advice from College Students

*For this column, we picked one piece of advice that the four panelists gave to share with you!*



Ayinde Alleyne (Bard '14) is now a senior at the University of Pennsylvania (Penn) in Philadelphia, where he is majoring in Mechanical Engineering. Ayinde talked about the advantages of joining clubs. Ayinde says, "First, it puts you in touch with people who share an interest that is important to you. College is a busy time, so the extra activities that people decide to take part in are very important to them... Second, clubs provide another outlet for your drive and work ethic other than class. College life works best when you find a balance among the things you do. Third, some of the groups you can be involved with are all about professional development and can provide invaluable networks for future jobs and career decisions."

Now and in college, make sure you spend time doing the things you love.



Christian Henderson (Siena '14) is now a sophomore at Siena College, one of the SPMPs summer campuses. Christian is majoring in Finance. Christian talked about how hard it is to choose the college that is just right for you. When he was in 12th grade, his dream schools were Georgetown and University of Maryland College Park (UMCP). Christian has older siblings who went to expensive colleges and graduated with debt. Two years later, Christian said that while he doesn't regret this choice, UMCP was also affordable and might have been a better fit for him.

Choosing colleges is hard! Start your research early so you can find a school that both meets your needs and is affordable.



Mahrukh Paracha (Bard '14) is now a junior at Queens College here in New York. Mahrukh is majoring in Applied Mathematics. Mahrukh says, "Originally, I had my heart on going away for college and getting the full college experience. All I wanted to do was dorm like the rest of my friends. [However,] when I went to the conference for TIME 2000, it won my heart. I didn't care that the program was at Queens College, ... I knew that even though I got into all the schools I applied to, TIME 2000 would best prepare me in the secondary education mathematics field. Till this day I truly believe this is one of the best decisions I have ever made in my entire life... Joining TIME 2000 has made me gain so many amazing experiences, friends, and opportunities."

Visiting colleges is a critical way to find out what is right for you.



Matt Hirsh (Bard '13 and Siena '14) is now a junior at Swarthmore College outside Philadelphia. Matt is majoring in Math and Engineering. Matt talked about why he chose a small school (D3) rather a large school with more serious sports (D1). Matt says, "I knew I wanted to go to an academically rigorous school, but I also wanted to play varsity tennis. However, the time commitment can be very demanding at a D1 school. D3 seemed perfect because I could play on my school's team, but have time to pursue challenging academics and other activities. I [also] wanted to have small, discussion-based classes. My most powerful learning experiences have come from math classes where all the students and the professor sit at a round table and we just talk about the problems we are working on. It's a very collaborative environment where we share and develop ideas for solving our weekly problems."

When you chose a college, think about where you learn best. Find a place that will let you learn, make friends, and enjoy clubs or activities.

# Applying to College: Show You're Ready!

Kevin Hudson is the Assistant Director for College Opportunity at Princeton University. Kevin went to Princeton for college, where he became friends with Marcus Neal, who has been on the SPMPs faculty since 2011. Earlier in his career, Kevin was an admissions officer, which means that he read thousands of college applications each year from students who wanted to attend Princeton. Kevin also reads applications for scholarships like the Gates Millennium Scholarship. Based on his experience, Kevin shared with us his advice on what you need to do to apply to college.

Kevin explained that when colleges look at your application they are trying to figure out how likely it is that you will succeed at their university. Using the evidence you provide -- in the form of grades, test scores, recommendations, essays, and biographical information -- they decide if you are ready for their environment. Kevin also said that colleges ask three questions when they think about you.

First, are you academically prepared? A college won't admit you if they think you are not ready for the work. To make this decision, colleges look both at how you have done (grades and test scores)

but also how hard you have challenged yourself. Getting an A in math class is good; getting an A in AP Calculus is better. When the course is harder, the grade means even more because it shows that you can handle hard work. In some cases, getting a B+ in AP Calculus may be more valuable than getting an A in Calculus (not AP), because you are taking a harder class. **Are you on track to get to Calculus?** Most students take Algebra, then Geometry, then Algebra 2, then Pre-Calculus/Trigonometry, then Calculus. If you took Algebra in 8<sup>th</sup> grade, you should be fine. If not, talk to SPMPs about how to accelerate your math learning (for example, you can take a course over the summer).

Second, will you contribute to life on the college campus? Colleges are places of living as well as places of learning and they want to admit students who will be interesting to be around. Your application should tell a story, where an admissions officer can quickly tell what you love to do. Imagine two students, one who says "I love to help kids" and another who says "I volunteered for three years in my neighborhood elementary school." **Which student would you accept to college? Why?** Figure out what



Kevin Hudson. The slide below is courtesy of Kevin.

make you interesting and what you love to do and make sure there is evidence of that in your college application.

Third, do you have the meta cognitive skills to succeed in college and life? Meta cognitive refers to how your brain works, and includes personal traits like motivation and goal setting. Colleges realize that if you have overcome obstacles, then you are more likely to handle the challenging environment at college. Maybe you worked a job in addition to going to school, showing that you can handle additional responsibilities. Maybe you were struggling in a class, but you worked very hard, improved your grades, and got that teacher to write a recommendation about how you persevere. There are two opportunities to show these skills off. **First, consider asking a teacher who has seen you struggle and then succeed for a recommendation. Second, think about a time when you struggled, made a mistake, or learned a valuable lesson. This might be a good topic for your college essay.**

The most successful college applications require preparation. Kevin's advice will get you started. After that, SPMPs is here to help. We are happy to discuss academic preparation, contribution to campus, meta cognition, and anything else that's on your mind. 10<sup>th</sup> and 11<sup>th</sup> graders: now is the time to get ready!

## Admissions: Based on Evidence

### Are you academically prepared?

#### Based on...

- HS Transcript
- Profile (where you come from)
- External academics (like summer programs)
- PSAT/SAT/ACT/SAT Subject Test/AP scores
- Recommendations

### Will you contribute to the community?

#### Based on...

- Evidence of contribution to your school community (clubs, leadership, etc.)
- Evidence of contribution to your home community (including family, church, volunteering)

### Metacognitive Variables (will you stick with it?)

#### Based on...

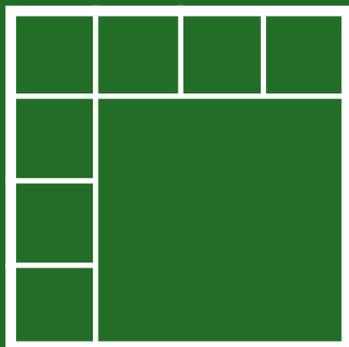
- Motivation (do you seek out challenge?)
- Perseverance
- Goal setting
- Navigating the system (do you find out how to do things when you don't know?)

## Dan's Challenge Problem



Send in the solution to this problem to have it printed and win a free book!

Here is a picture of a square divided into 8 smaller squares:



Either find a way to divide a square into 22 smaller squares, or explain why it cannot be done.

**How to submit:** Send your answer to [spmps@artofproblemsolving.org](mailto:spmps@artofproblemsolving.org), or mail to to:  
SPMPS  
PO Box 4499  
New York, NY 10163

The correct solution will be printed in the June/July newsletter. After that, our next newsletter will be the August/September newsletter after SPMPS!

# Challenge Problem Solution

It looks like I stumped you this time! We got no solutions...

Split the grid into pieces so that (a) all pieces are made up of the same number of squares, and (b) all pieces have the same sum of the numbers inside them. (The pieces cannot overlap, and they must each contain only whole squares.)

					6	5	6
4			2			4	
	3		3		4		
				4			
		4				3	
	4			4			4
1	1	1					

All pieces are made of the same number of squares and there are 56 squares, so the number of pieces must divide 56. Because all pieces have the same sum of numbers in them and the sum of all the numbers is 63, the number of pieces

must also divide 63. The only common factor is 7, so there are seven pieces. Each piece has  $56/7 = 8$  squares, and the numbers in each piece sum to  $63/7 = 9$ .

If you look at the 6 in the top-right, its piece must also have the three down below. Also, the piece with the 5 in the top-right must have the 4 just below it. We must then fill them with extra blank squares until they have 8 squares each, and there's really only one way to do that without blocking other numbers. Several other pieces basically need two 4's and a 1. Working it out is not hard from here, and you get:

					6	5	6
4			2			4	
	3		3		4		
				4			
		4				3	
	4			4			4
1	1	1					

## Remember When?



SPMPS 2014 Field Day at the Bard campus. Photo by Ana Portnoy.