

MATHCOUNTS®

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*Math's going
National!*



We've added cherry blossoms to our newsletter to celebrate being back in DC for the National Competition!



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**2016 MATHCOUNTS
National Competition Sponsor**

MATHCOUNTS®

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Over 200 Coaches Participate in Competition Math Course



Classes for *Competition Math for Middle School*—a new online course by MATHCOUNTS, Art of Problem Solving and the University of Oklahoma—began in October, with more than 200 enrolled coaches.

Educators taking this course gain tools for training competition students. Classes feature exclusive content designed by Art of Problem Solving, as well as expert advice from MATHCOUNTS content creators and Art of Problem Solving teachers. Multiple national-level coaches in the Competition Series also contributed to the course content with advice on how to encourage and motivate students.

Classes conclude in December, and participants who complete all course requirements will earn one graduate credit from the University of Oklahoma. More information about this course can be found at mathcounts.ou.edu.

MATHCOUNTS Trainer App Launches

Over 500,000 math problems have been solved on the *MATHCOUNTS Trainer*, which launched as an app in September.



Created by *Art of Problem Solving*, the Trainer gives Mathletes a fun way to prepare for MATHCOUNTS competitions. Students can work through problems from past school, chapter, state and national competitions and have access to full solutions and real-time dashboards to track their progress.

The Trainer is available for free on the App Store for all iOS devices and at www.aops.com/mathcounts_trainer.

2016 Raytheon MATHCOUNTS National Competition Returns to Washington, DC

The **2016 Raytheon MATHCOUNTS National Competition**—an event bringing together the best young mathematicians in the country—will take place in Washington, DC for the 22nd time in the program's history.

"It's really fitting that the nation's 224 top Mathletes will come together in our nation's capital to vie for the 2016 National Champion title," said MATHCOUNTS executive director Lou DiGioia. "We're so excited to bring the National Competition back to DC this year." The event will take place May 7-10 at the Renaissance Washington DC Hotel.

The MATHCOUNTS Competition Series opened in September with new resources for coaches, including the **Guide for New Coaches**, designed to give new teachers the tools needed to lead their students to success in the program. The guide is a free resource included in the **2015-2016 MATHCOUNTS School Handbook**.

More information about the Competition Series, including preparation resources and registration, is available at www.mathcounts.org/competition.



IMPORTANT DATES FOR 2015-2016

- Now** Registration is open for the MATHCOUNTS Competition Series at www.mathcounts.org/compreg
- Now** 2016 School Competition is available for download to all registered coaches
- Dec. 11** (postmarked) Deadline to register for the MATHCOUNTS Competition Series. *Register on time to ensure your students' participation.*
- Jan. 30– Feb. 29** Over 500 MATHCOUNTS Chapter Competitions take place nationwide
- Mar. 1-31** 56 State Competitions take place
- May 7-10** Top 224 Mathletes advance to the 2016 Raytheon MATHCOUNTS National Competition in Washington, DC

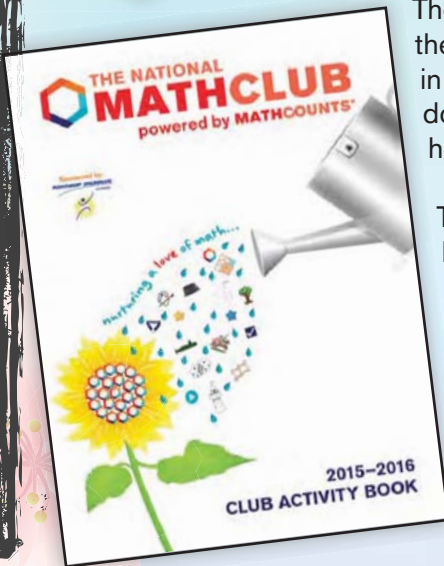
IMPORTANT DATES FOR 2015-2016

- Now** Free registration is open for the National Math Club at www.mathcounts.org/clubreg
- Feb. 26** (received) Silver Level deadline to be eligible for all awards, as well as entry into the Silver Level Drawing
- Mar. 25** (received) Gold Level deadline to be eligible for all awards, as well as entry into the Gold Level + Grand Prize Drawings
- Apr. 29** Drawing winners announced on MATHCOUNTS website
- May 8-9** Club leader + 4 students from Grand Prize winning club attend 2016 Raytheon MATHCOUNTS National Competition in Washington, DC
- May 27** (received) Final deadline for Silver + Gold Level Awards available while supplies last.

MATHCOUNTS Adds More Hands-On Resources to The National Math Club®



Club leaders participating in the 2015-2016 National Math Club will receive even more free resources than in previous years. As part of the MATHCOUNTS Foundation's efforts to expand the free materials offered to educators, this year's **Club in a Box Kit** includes all of the tools and handouts needed for three different hands-on activities.



The National Math Club is designed to give educators the resources they need to engage their students in fun, interactive math activities in a social, pressure-free setting. This year's club resources cover dozens of topics ranging from probability to plane geometry and help students build their problem-solving skills.

The **2015-2016 Club Activity Book** also includes a Guide for New Club Leaders, to help club leaders get the most out of the program and find the resources and activity ideas that work best for their students. Currently more than 100 club activity ideas are available to educators online.

The Northrop Grumman Foundation is sponsoring the National Math Club for the third year in a row. More information is available at www.mathcounts.org/club.

2015-2016 Playbook Launched as New Resource for Math Video Challenge® Teams

The Math Video Challenge opened in September with the **2015-2016 Playbook**, a comprehensive new resource designed exclusively for participants and team advisors in the program.

The Math Video Challenge was recently recognized for its effectiveness by Change the Equation and is currently listed as an **Accomplished Program in STEMworks**. Participants in this program are challenged to take a creative approach to solving a MATHCOUNTS handbook problem: students must explain the solution to the problem, and then apply its math concept to a real-world scenario—all in a five minute original video.

The playbook is the primary Math Video Challenge resource and includes a Guide for New Team Advisors—with detailed guidelines for creating videos—and templates and tools teams can use to complete their video project. The playbook also includes all 250 handbook problems categorized by math topic, making it easier for educators to use the program as part of their classroom instruction.

More information about the Math Video Challenge and the **2015-2016 Playbook** can be found at videochallenge.mathcounts.org.



IMPORTANT DATES FOR 2015-2016

- Now** Free registration + video submission are open for the Math Video Challenge at videochallenge.mathcounts.org
- Feb. 3** Last day to submit videos before voting begins. *Get your video submitted by this day to have the most time to collect votes.*
- Feb. 4** Voting opens to the general public
- Mar. 14** General public voting closes. *Last day to get those votes!*
- Mar. 17** Top 100 videos advance to first round of Judges Panel review
- Mar. 28** 20 Semifinalist videos announced
- Apr. 4** 4 Finalist videos announced
- May 8-9** Finalists present their videos at the 2016 Math Video Challenge Finals in Washington, DC

Inspiring & Celebrating Women in STEM

Fun Fact: For the past 15 years every math content specialist on the MATHCOUNTS staff has been a woman.
#WomenInSTEM

MATHCOUNTS was created in 1983 as a way to *empower students in mathematics*. To this day, that goal is at the heart of our organization's mission and efforts.

But one thing that *has* changed in the past 32 years (we think for the better) is the way our society thinks and talks about STEM. Now, far more than in 1983, we as a nation are prioritizing not only *what* we accomplish in STEM, but *who* is empowered to accomplish it. We recognize that innovation happens more quickly and effectively when people from various backgrounds are able to give input. We see that having some groups of people underrepresented in STEM affects us all because we miss out on their untapped talent.

Our programs are and always have been for all middle school students, but as a STEM education organization, we have a responsibility to do everything we can to make STEM welcoming to *everyone*, regardless of their race, ethnicity, gender or income—and especially to groups that historically have been made to feel unwelcome. It's the reason we've made outreach a major priority, and it's the reason we focus our *Giving Tuesday* campaign on supporting Title I schools.

Despite the accomplishments that have been made in removing barriers, women are still a group underrepresented in STEM. But given that Thanksgiving is just around the corner, we decided to interview a few amazing women for whom we are *grateful*. The work that MATHCOUNTS State and Chapter Coordinator *Betty Jean Jordan* (Alumna, 1983-84), MATHCOUNTS Coach *Sarah Manchester* (Alumna, 1985-86) and MATHCOUNTS Board Member *Heidi Pomerantz* (Alumna, 1991-92) do helps prepare the next generation of STEM leaders. And what matters just as much is that their influence as role models means that more of those future leaders will be women.



Betty Jean Jordan

Why did you decide to give back to MATHCOUNTS and STEM education? Why is the work you've done important to you? Math team was my favorite extracurricular activity, beginning with MATHCOUNTS in 8th grade. I loved learning how to solve problems and the thrill of competition. I'm very grateful that I attended excellent public schools where learning—math, science, and all subjects—was so valued. My father, a retired industrial engineer, had a big influence on me, too. He often told me I should go to Georgia Tech and be a civil engineer. Who knew that I would do just that?

With such strong encouragement in STEM from so many sources, I can't help but want to pay it forward to today's young people. When I first joined the Georgia Society of Professional Engineers nearly 20 years ago and learned of its role in MATHCOUNTS, I had to volunteer. I've found that the most rewarding activities throughout my life have been both challenging and fun. That's exactly what MATHCOUNTS is.

What advice would you give to middle school girls who are interested in STEM? Keep learning about as many different STEM topics as you

can. Take classes, read books, do enrichment activities—anything to help you understand more about how everything is connected. I majored in civil engineering and thought I wanted to focus on the sub-discipline of environmental engineering. Then, during my senior year of college, I took hydrology and loved it. I went on to get a masters in hydraulics and hydrology, and I still work in that field today.

It's really true that you never stop learning; be proactive and look for unique opportunities. Currently, I'm completing an on-line course through Georgia Tech on energy resources and technologies—topics that I've wanted to learn more about for a long time. It has an indirect bearing on my work because of some of my clients, but it's also helping me be a more informed citizen. Finally, do your best in all of your classes, whether they are STEM or not. Even in a STEM career you have to understand subjects like government and economics, and you have to be able to communicate well in written and oral formats. We need good technical people who can bring solid scientific principles and critical thinking into all parts of society.

One time [during my one of my work quarters in college] a concrete truck driver actually told me that I should be at home in the kitchen. I replied, "I believe that women should be in the House... and the Senate." It went right over his head.

-Betty Jean Jordan
on how she used humor to handle "thankfully rare" past experiences of sexism in STEM



Sarah Manchester

Why did you decide to give back to MATHCOUNTS and STEM education? Why is the work you've done important to you? I had such positive experiences with mathematics in school—great teachers and math team coaches, challenging courses in middle and high school, and lots of opportunities to sharpen my problem-solving skills in various competitions. Too often, when I say I'm a math teacher, I hear things like "math was so hard for me" or "math was boring." It motivates me to hopefully change some perceptions of math in the next generation. I don't expect that all my students will share my absolute passion for math, but at least, there will be times where they say "oh, that was an interesting pattern" or feel pride when they come up with a novel way to solve a problem.

When you're coaching, how do you help your students stick with math even when they encounter challenges and problems they cannot solve? One thing I like to do is tell the students when I get a problem wrong—I give them my incorrect answer and see if they can figure out my mistake. Hopefully, if they see that even someone with more than 30 years of experience makes mistakes, that will encourage them to keep trying. Plus, they are excited to tell me what I did wrong. Also, there are so many different problem-solving strategies—a good one is to try and solve a simpler version of the problem and see if you can extend from there. During team practices, my veteran members do most of the explaining, so novices see that if they stick with math, they will continue to learn new strategies and eventually become the ones teaching the newcomers.

Why do you think it's important for girls to build their math skills and have experiences in STEM? When I was younger, I was one of the few and sometimes the only girl representing my school, county or state at various competitions. While this was a motivating factor for me, the gender imbalance is a turn-off to some girls. Ultimately, I think it's important for everyone to develop their math skills and have positive STEM experiences. Thus, if there are any students that feel discouraged by not seeing their peers represented, students within that group need extra encouragement to stick with it.

I had to show that I could keep up with—and hopefully beat—the guys.

-Sarah Manchester
on why she felt motivated in competitions where she was the only girl



Heidi Pomerantz

Why did you decide to give back to MATHCOUNTS and STEM education? Why is the work you've done important to you? I represent bona fide proof that what you do in middle school may just alter the course of your life. I owe my 18-year career at Texas Instruments to MATHCOUNTS, as being an alumna is what tied TI and me together! I give back to MATHCOUNTS because it matters. Middle school represents a turning point for adolescents. It's likely the first time adults start (sometimes proudly) telling kids, "I was terrible at math" or "Don't ask me! I couldn't even do Algebra!"—poisonous statements to impressionable young minds. Middle school finds kids at a time when they are exploring and developing confidence in their abilities and coming to be their own person. MATHCOUNTS helps neutralize (and eliminate) the fear so many kids have about math.

What advice would you give to middle school girls who are interested in STEM? It's OK to be smart. And it's also OK to not know the answer. Find something you are passionate about, and immerse yourself in it.

For the next several years, your whole job is to learn. Learn as much as you can about what is out there in terms of careers and opportunities, in addition to subject material from your classes! When you find something that captivates you, investigate it. Stretch yourself to take challenging classes. Be courageous. Don't make friends with people who make you feel "less than" because you like to learn, get good grades, or raise your hand in class.

Don't let conventional thinking lead you to believe "math is boring" or "Algebra is hard!" Being smart or good at math (or any other subject) is not unfeminine.

-Heidi Pomerantz
on what she would say to girls who are interested in STEM

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Allie + Alex Poster Solution

While *Allie* and *Alex* were busy taking on the ski slopes, we hope you were busy solving this math problem! If you need some help, check out a couple different solutions below. And in case you were getting hot cocoa at the ski lodge and missed *Allie* and *Alex's* race, you can download the poster for free from the MATHCOUNTS website, along with the 2015–2016 MATHCOUNTS School Handbook.

SOLUTION 1: *Allie* passes a flag every six seconds, and *Alex* passes a flag every five seconds. We can write equations for each of their distances since distance = rate \times time. *Alex's* distance will be $\frac{1}{5} \times t$, where t represents the time in seconds from when *Alex* starts skiing and the distance is measured in the number of flags passed. *Allie's* distance will be $\frac{1}{6} \times (t + 6)$, since she has a 6 second head start on *Alex*. To find when *Alex* will reach *Allie*, we can set the two expressions to be equal and solve for t .



$$\left(\frac{1 \text{ flag}}{5 \text{ seconds}}\right) \times t \text{ seconds} = \left(\frac{1 \text{ flag}}{6 \text{ seconds}}\right) \times (t + 6) \text{ seconds}$$

$$\frac{t}{5} = \frac{t + 6}{6}$$

$$\frac{1}{5}t = \frac{1}{6}t + 1$$

$$\left(\frac{1}{5} - \frac{1}{6}\right)t = 1$$

$$\frac{1}{30}t = 1$$

$$t = 30$$

Alex will reach *Allie* after 30 seconds.

SOLUTION 2: Another way to solve this problem is to use a table to show distance verses time. Measuring time from when *Alex* starts skiing, we can fill in the table shown at right.

We see that *Allie* and *Alex* will both be at flag number six at 30 seconds.

Distance (Flags)	<i>Allie's</i> Time (Seconds)	<i>Alex's</i> Time (Seconds)
1	0	5
2	6	10
3	12	15
4	18	20
5	24	25
6	30	30

You can find the solution to the math problem in Kami + Kelvin's Skiing Class poster, along with an archive of more than 10 years worth of MATHCOUNTS posters and solutions at www.mathcounts.org/poster.



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Learn more at solveathon.mathcounts.org!

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www.mathcounts.org/donate

*In how many ways can **Kelvin**
and **Kami** each be randomly
assigned to one of **seven**
ski instructors?*



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