

GUIDE FOR NEW COACHES

Welcome to the MATHCOUNTS® Competition Series! Thank you so much for serving as a coach this year. Your work truly does make a difference in the lives of the students you mentor. We've created this Guide for New Coaches to help you get acquainted with the Competition Series and understand your role as a coach in this program.

If you have questions at any point during the program year, please feel free to contact the MATHCOUNTS national office at info@mathcounts.org.

WHAT DOES THE TEST LOOK LIKE? MATHCOUNTS competition typically consists of 4 rounds—Sprint, Target, Team and Countdown Rounds. Altogether the rounds take about 3 hours to complete. **However, Team and Countdown Rounds will not be conducted officially in the 2020-2021 Competition Series until the national level.** Here's what each round looks like.



Sprint Round

40 minutes
30 problems total
no calculators used
focus on speed and accuracy



Target Round

Approx. 30 minutes
8 problems total
calculators used
focus on problem-solving and mathematical reasoning

The problems are given to students in 4 pairs. Students have 6 minutes to complete each pair.



Team Round

20 minutes
10 problems total
calculators used
focus on problem-solving and collaboration

National level only for 2020-2021. The online practice competitions will have team rounds.



Countdown Round

Maximum of 45 seconds per problem
no calculators used
focus on speed and accuracy

National level only for 2020-2021.

HOW DO I GET MY STUDENTS READY FOR THESE COMPETITIONS? What specifically you do to prepare your students will depend on your schedule as well as your students' schedules and needs. But in general, working through lots of different MATHCOUNTS problems and completing practice competitions are the best ways to prepare. Each year, MATHCOUNTS provides the *MATHCOUNTS School Handbook* to all coaches, plus lots of additional free resources online. This guide will explain the layout of the *School Handbook* and other resources, plus give you tips on structuring your team meetings and preparation schedule.

THE ROLE OF THE COMPETITION COACH

Your role as the coach is such an important one, but that doesn't mean you need to know everything, be a math expert or treat coaching like a full-time job. Every MATHCOUNTS coach has a different coaching style and you'll find the style that works best for you and your students. But in general, **every good MATHCOUNTS coach must do the following:**

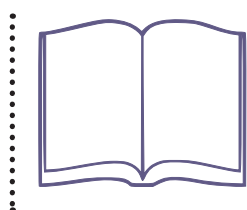
- Schedule and run an adequate number of practices for participating students (these can be online).
- Help motivate and encourage students throughout the program year.
- Select the 1-15 student(s) who will represent the school at the Chapter Competition in February.
- Ensure students can log in on the AoPS Contest Platform and are familiar with using the platform.

You don't need to know how to solve every MATHCOUNTS problem to be an effective coach. In fact, many coaches have told us that they themselves improved in mathematics through coaching. Chances are, you'll learn with and alongside your students throughout the program year.

You don't need to spend your own money to be an effective coach. You can prepare your students using solely the free resources and this handbook. We give coaches numerous detailed resources and recognition materials so you can guide your Mathletes® to success even if you're new to teaching, coaching or competition math, and even if you use only the free resources MATHCOUNTS provides all competition coaches.

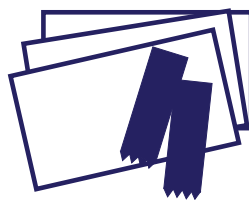
MAKING THE MOST OF YOUR RESOURCES

As the coach of a registered competition school, you already have received what we at MATHCOUNTS call the **School Competition Kit**. Your kit includes the following materials for coaches.



2020-2021 MATHCOUNTS School Handbook

The most important resource included in the School Competition Kit. Includes 200 problems.



Student Ribbons and Certificates

Ribbons and participation certificates for each registered student.

You'll also get access to electronic resources including **50 more handbook problems**. The following are available to coaches at www.mathcounts.org/coaches. This section of the MATHCOUNTS website is restricted to coaches and you already should have received an email with login instructions. *If you have not received this email, please contact us at info@mathcounts.org to confirm we have your correct email address.*

2020 MATHCOUNTS School, Chapter + State Competitions

Released by mid-April 2020
Each level includes all 4 test rounds and the answer key

MATHCOUNTS Practice Plans for Team Meetings

Pre-planned virtual mini-lessons, each 45-60 minutes, that cover a particular math topic.

MATHCOUNTS Problem of the Week

Released each Monday
Each multi-step problem relates to a timely event

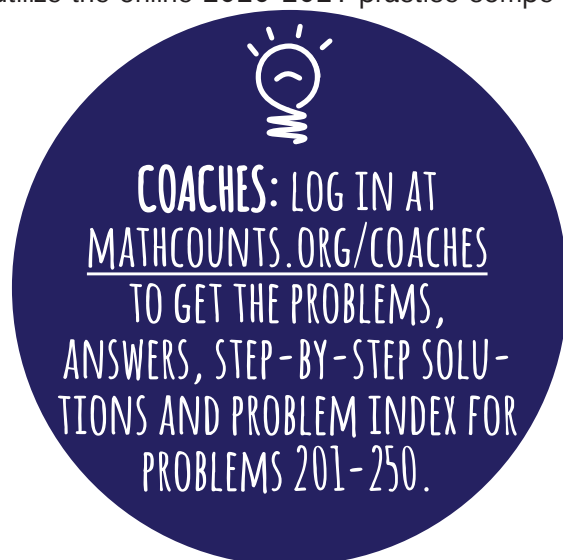
You can use any or all of these resources to choose the students who will represent your school at the Chapter Competition.

It is especially important though that your official competitors utilize the online 2020-2021 practice competitions so they are familiar with the online competition platform.

The **2020-2021 MATHCOUNTS School Handbook** will be your primary resource for the Competition Series this year. It is designed to help your students prepare for each of the rounds of the test, plus build critical thinking and problem-solving skills. This section of the Guide for New Coaches will focus on how to use this resource effectively for your team.

WHAT'S IN THE HANDBOOK? There is a lot included in the *School Handbook*, and you can find a full table of contents on pg. 9 of this book, but below are the sections that you'll use the most when coaching your students.









- **Handbook Problems:** 250 math problems (200 in the book and 50 online) divided into Warm-Ups, Workouts and



Stretches. These problems increase in difficulty as the students progress through the book. (pg. 12)

- **Solutions to Handbook Problems:** complete step-by-step explanations for how each problem can be solved. These detailed explanations are only available to registered coaches. (pg. 36)
- **Problem Index + Common Core State Standards Mapping:** catalog of all handbook problems organized by topic, difficulty rating and mapping to Common Core State Standards. (pg. 50)
- **Answers to Handbook Problems:** key available to the general public. Your students can access this key, but not the full solutions to the problems. (pg. 52)

There are 3 types of handbook problems to prepare students for each of the rounds of the competition. You'll want to have your students practice all of these types of problems.

<p style="text-align: center;">Warm-Ups</p> <p>14 Warm-Ups in handbook 10 questions per Warm-Up no calculators used</p> <div style="text-align: center;">  </div> <p style="text-align: center;">  <i>Warm-Ups prepare students particularly for the Sprint Round.</i> </p>	<p style="text-align: center;">Workouts</p> <p>8 Workouts in handbook 10 questions per Workout calculators used</p> <div style="text-align: center;">  </div> <p style="text-align: center;">  <i>Workouts prepare students particularly for the Target Round.</i> </p>	<p style="text-align: center;">Stretches</p> <p>3 Stretches in handbook Number of questions and use of calculators vary by Stretch</p> <p style="text-align: center;"><i>Each Stretch covers a particular math topic that could be covered in any round. These help prepare students for all rounds.</i></p> <p style="text-align: center;">     </p>
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IS THERE A SCHEDULE I SHOULD FOLLOW FOR THE YEAR? On average coaches meet with their students for an hour once a week at the beginning of the year, and more often as the competitions approach. Practice sessions may be held virtually or in-person, before school, during lunch, after school, on weekends or at other times, coordinating with your school's schedule and avoiding conflicts with other activities.

Designing a schedule for your practices will help ensure you're able to cover more problems and prepare your students for competitions. We've designed the *School Handbook* with this in mind. Below is a suggested schedule for the program year that mixes in Warm-Ups, Workouts and Stretches from the *School Handbook*, plus free practice competitions from last year. This schedule allows your students to tackle more difficult problems as the Chapter Competition approaches.

<p>Mid-August – September 2020</p> <p>Warm-Ups 1, 2 + 3 Workouts 1 + 2</p>	<p>October 2020</p> <p>Warm-Ups 4 + 5 Workout 3 Mixture Stretch Practice Competition 1</p>	<p>November 2020</p> <p>Warm-Ups 6 + 7 Workout 4 Statistics Stretch Practice Competition 2</p>	<p>December 2020</p> <p>Warm-Ups 8 + 9 Workout 5 Pascal's Triangle Stretch Practice Competition 3</p>
<p>January 2021</p> <p>Warm-Ups 10 +11 and Workout 6 Past Competitions (2020 School + Chapter) Practice Competition 4 <i>Select chapter competitors (required by this time)</i></p>		<p>February 2021</p> <p><i>2021 MATHCOUNTS Chapter Competition</i> <i>2021 MATHCOUNTS Chapter Invitational</i></p>	

**FINISHED ALL THE PROBLEMS IN THE HARD-COPY HANDBOOK?
FIND 50 MORE CHALLENGING PROBLEMS AT
WWW.MATHCOUNTS.ORG/COACHES**

You'll notice that in January you'll need to select the 1-15 student(s) who will represent your school in the Chapter Competition. This must be done by **January 15, 2021**. You'll identify your official competitors on the Art of Problem Solving (AoPS) Contest Platform.

It's possible you and your students will meet more frequently than once a week and need additional resources. If that happens, don't worry! You and your Mathletes can work together using the **Interactive MATHCOUNTS Platform**, powered by NextThought. This free online platform contains numerous *MATHCOUNTS School Handbooks* and past competitions, not to mention lots of features that make it easy for students to collaborate with each other and track their progress. You and your Mathletes can sign up for free at mathcounts.nextthought.com.



And remember, just because you and your students will meet once a week doesn't mean your students can only prepare for MATHCOUNTS one day per week. Many coaches assign "homework" during the week so they can keep their students engaged in problem solving outside of team practices. Here's one example of what a 2-week span of practices in the middle of the program year could look like.

Monday	Tuesday	Wednesday (Weekly Team Practice)	Thursday	Friday
-Students continue to work individually on Workout 4, due Wednesday	-Students continue to work on Workout 4 -Coach emails team to assign new homework problem(s), due Wednesday	-Coach reviews solutions to Workout 4 -Coach gives Warm-Up 7 to students as timed practice and then reviews solutions -Students discuss solutions to homework problem(s) in groups	-Coach emails math team to assign Workout 5 as individual work, due Wednesday	-Students continue to work individually on Workout 5
-Students continue to work individually on Workout 5, due Wednesday	-Students continue to work on Workout 5 -Coach emails team to assign new homework problem(s), due Wednesday	-Coach reviews solutions to Workout 5 -Coach gives Warm-Up 8 to students as timed practice and then reviews solutions -Students discuss solutions to homework problem(s) in groups	-Coach emails math team to assign Workout 6 as group work, due Wednesday	-Students work together on Workout 6 using online Interactive Platform

WHAT SHOULD MY TEAM PRACTICES LOOK LIKE? Obviously every school, coach and group of students is different, and after a few practices you'll likely find out what works and what doesn't for your students. Here are some suggestions from veteran coaches about what makes for a productive practice.

- Encourage discussion of the problems so that students learn from each other
- Encourage a variety of methods for solving problems
- Have students write math problems for each other to solve
- Practice working in groups so students can learn from one another
- Practice oral presentations to reinforce understanding

On the following page is a sample agenda for a 1-hour practice session. There are many ways you can structure math team meetings and you will likely come up with an agenda that works better for you and your group. It also is probably a good idea to vary the structure of your meetings as the program year progresses.

MATHCOUNTS Team Practice Sample Agenda – 1 Hour

Review Assigned Homework Problem(s) (10 minutes)

- Have 1 student come to the board to show how s/he solved the problem(s).
- Have students divide into groups of 4 to discuss the solution presented and other methods for solving.
- Have 2 groups share an alternate solution.
- Discuss as a group other strategies to solve the problem (and help if any groups answered incorrectly).

Timed Practice with Warm-Up (15 minutes)

- Have students put away all calculators and have one student pass out Warm-Ups (face-down).
- Give students 12 minutes to complete as much of the Warm-Up as they can.
- After 12 minutes is up, have students hold up pencils and stop working.

Play Game to Review Warm-Up Answers (35 minutes)

- Have students divide into 5 groups (size will depend on number of students in meeting).
- Choose a group at random to start and then rotate clockwise to give each group a turn to answer a question. When it is a group's turn, ask the group one question from the Warm-Up.
- Have the group members consult their completed Warm-Ups and work with each other for a maximum of 60 seconds to choose the group's official answer.
- Award 2 points for a correct answer on questions 1-3, 3 points for questions 4-7 and 5 points for questions 8-10. The group gets 0 points if they answer incorrectly or do not answer in 60 seconds.
- Have all students check their Warm-Up answers as they play.
- Go over solutions to select Warm-Up problems that many students on the team got wrong.

OK I'M READY TO START. HOW DO I GET STUDENTS TO JOIN? Here are some tips given to us from successful competition coaches and club leaders for getting students involved in the program at the beginning of the year.

- Ask Mathletes who have participated in the past to talk to other students about participating.
- Ask teachers, parent volunteers and counselors to help you recruit.
- Reach parents through school newsletters, PTA meetings or Back-to-School-Night presentations.
- Advertise around your school by:
 1. posting intriguing math questions (specific to your school) in your school and referring students to the first meeting for answers.
 2. designing a bulletin board or display case with your MATHCOUNTS poster (included in your School Competition Kit) and/or photos and awards from past years.
 3. attending meetings of other extracurricular clubs (such as honor society) so you can invite their members to participate.
 4. adding information about the MATHCOUNTS team to the website for your class or school.
 5. making a presentation at the first pep rally or student assembly.



Good luck in the competition! If you have any questions during the year, please contact the MATHCOUNTS national office at info@mathcounts.org.

**COACH RESOURCES:
WWW.MATHCOUNTS.ORG/COACHES**

HIGHLIGHTED RESOURCES

ACCESS MORE RESOURCES AT WWW.MATHCOUNTS.ORG/COACHES

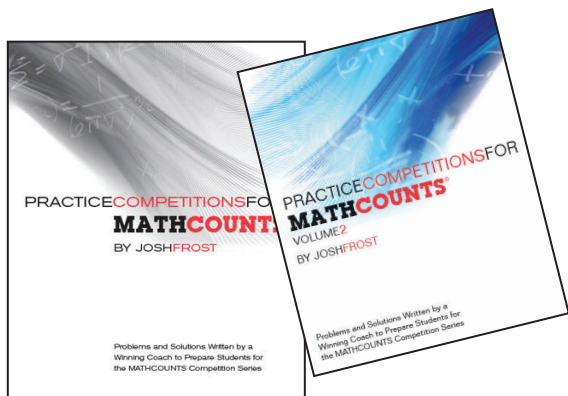
MATHCOUNTS OPLET

The Online Problem Library & Extraction Tool (OPLET) is a database of over 13,000 problems and over 5,000 step-by-step solutions. Create personalized quizzes, flash cards, worksheets and more!

SAVE \$25 WHEN YOU BUY YOUR SUBSCRIPTION
BY OCT. 1, 2020

www.mathcounts.org/myoplet

PRACTICE COMPETITIONS FOR MATHCOUNTS, VOL. 1 & 2

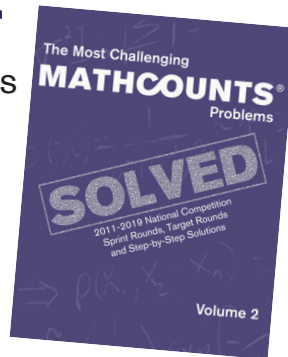


Practice books written by repeat national-level coach Josh Frost. Each volume includes 4 complete mock-competitions plus solutions.

www.mathcounts.org/store














MOST CHALLENGING MATHCOUNTS PROBLEMS SOLVED, VOL. 2

This book contains the Sprint Round and Target Round problems from the 2011 – 2019 MATHCOUNTS National Competitions plus never-before-available, step-by-step solutions!



COMING SEPTEMBER 2020!

CRITICAL 2020-2021 DATES

-  Jun. 16 – Jan. 15 Submit your school's registration to participate in the Competition Series. The fastest way for schools to register is online at www.mathcounts.org/compreg. Schools also can download the MATHCOUNTS Competition Series Registration form and mail or email it with payment to:
MATHCOUNTS Foundation – Competition Series Registrations
1420 King Street, Alexandria, VA 22314 Email: reg@mathcounts.org
- Parents who have confirmed their student's school is not participating in the program can register their child as a non-school competitor (NSC) this year. NSCs must register online and pay with a credit card at www.mathcounts.org/nscreg.
- Registered schools and NSCs will receive this year's School Competition Kit, which includes a hard copy of the *2020-2021 MATHCOUNTS School Handbook*. Kits are shipped on an ongoing basis between mid-August and January 31.
- Questions?** Email the MATHCOUNTS national office at info@mathcounts.org.
-  Oct. 1 (postmark) **Early Bird Registration Deadline** (\$30/student for schools and \$60/NSC)
After October 1, registration increases to \$35/student for schools and \$65/NSC.
-  Oct. 15 **Practice Competition 1 Released**, available for registered schools and NSCs at the Art of Problem Solving (AoPS) Contest Platform through January 31, 2021.
-  Nov. 15 **Practice Competition 2 Released**, available for registered schools and NSCs at the AoPS Contest Platform through January 31, 2021.
-  Dec. 1 (postmark) **Regular Registration Deadline** (\$35/student for schools and \$65/NSC)
After December 1, registration will cost \$40/student for schools and \$70/NSC.
-  Dec. 15 **Practice Competition 3 Released**, available for registered schools and NSCs at the AoPS Contest Platform through January 31, 2021.
-  Early Jan. Coaches should identify official chapter competitors on the AoPS Contest Platform at this time to ensure their students can practice using the competition platform. Identify official competitors by January 15 to ensure their participation in Practice Competition 4.
-  Jan. 15 (postmark) **Final Day to Register, Pay and Add Students** (\$40/student for schools and \$70/NSC)
MATHCOUNTS cannot guarantee participation for schools with outstanding invoices after January 15. Schools cannot add students to their registration after January 15.
-  Jan. 22-23 **Practice Competition 4**, available from 1:00pm ET on January 22 through 1:00pm ET on January 23 on the AoPS Contest Platform. Recommended for chapter competitors to use as a run-through for the Chapter Competition.
-  Feb. 5-6 **2021 Chapter Competition**, available from 1:00pm ET on February 5 through 1:00pm ET on February 6 on the AoPS Contest Platform.
-  Feb. 25 **2021 Chapter Invitational** at 7:00pm ET on February 25 on the AoPS Contest Platform. All competitors must take this competition at the same time.
-  Mar. 25 **2021 State Competition** at 7:00pm ET on March 25 on the AoPS Contest Platform. All competitors must take this competition at the same time.
-  May 8-11 **2021 Raytheon Technologies MATHCOUNTS National Competition** in Washington, DC