

# How To Use This School Handbook

## If You're a New Coach



Welcome! We're so glad you're a coach this year.  
Check out the **Guide for New Coaches**  
starting on the next page.

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## If You're a Returning Coach



Welcome back! Thank you for coaching again.  
Get the **2017-2018 Handbook Materials**  
starting on page 8.

# Guide For New Coaches

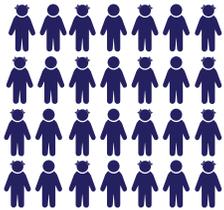
**Welcome to the MATHCOUNTS® Competition Series!** Thank you so much for serving as a coach this year. Your work truly does make a difference in the lives of the students you mentor. We've created this Guide for New Coaches to help you get acquainted with the Competition Series and understand your role 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 (703) 299-9006 or [info@mathcounts.org](mailto:info@mathcounts.org).

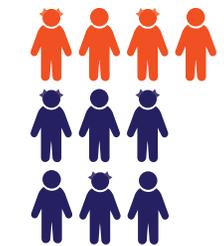
## the mathcounts competition series in a nutshell

The **MATHCOUNTS Competition Series** is a national program that provides students the opportunity to compete in live, in-person math contests against and alongside their peers. Created in 1983, it is the longest-running MATHCOUNTS program and is open to all sixth-, seventh- and eighth-grade students.

**HOW DOES IT WORK?** The Competition Series has 4 levels of competition—school, chapter, state and national. Here's what a typical program year looks like.



**Schools register in the fall and work with students during the year. Coaches administer the **School Competition**, usually in January.** Any number of students from your school can participate in your team meetings and compete in the School Competition. MATHCOUNTS provides the School Competition to coaches in November. Many coaches use this to determine which student(s) will advance to the Chapter Competition.



**Between 1 and 10 students from each school advance to the local **Chapter Competition**, which takes place in February.** Each school can send a team of 4 students plus up to 6 individual competitors. All chapter competitors—whether they are team members or individuals—participate in the individual rounds of the competition; then just the 4 team members participate in the team round. Schools also can opt to send just a few individual competitors, rather than forming a full team. Over 500 Chapter Competitions take place across the country.



**Top students from each Chapter Competition advance to their **State Competition**, which takes place in March.** Your school's registration fees cover your students as far as they get in the Competition Series. If your students make it to one of the 56 State Competitions, no additional fees are required.



**Top 4 individual competitors from each State Competition receive an all-expenses-paid trip to the **National Competition**, which takes place in May.** These 224 students combine to form 4-person state teams, while also competing individually for the title of National Champion.

**WHAT DOES THE TEST LOOK LIKE?** Every MATHCOUNTS competition consists of 4 rounds—Sprint, Target, Team and Countdown Round. Altogether the rounds are designed to take about 3 hours to complete. 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

*Only the 4 students on a school's team can take this round officially.*



### Countdown Round

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

*Students with highest scores on Sprint and Target Rounds compete head-to-head. This round is optional at the school, chapter and state level.*

**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 is the best way to prepare to compete. Each year MATHCOUNTS provides the *School Handbook* to all coaches, plus lots of additional free resources online.

The next sections of this Guide for New Coaches will explain the layout of the *MATHCOUNTS 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.
- Help motivate and encourage students throughout the program year.
- Select the 1-10 student(s) who will represent the school at the Chapter Competition in February.
- Take students to the Chapter Competition or make arrangements with parents and volunteers to get them there.



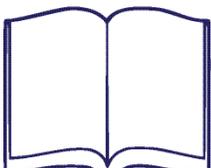
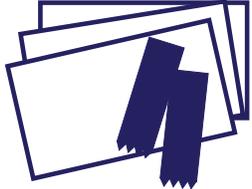
**Looking for tools to help you become a top-notch coach? check out our videos at the coach section of the MATHCOUNTS website!**

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.

 <p><b>2017-2018 MATHCOUNTS School Handbook</b> The most important resource included in the School Competition Kit. Includes 250 problems.</p>	 <p><b>Student Recognition Ribbons and Certificates</b> 10 participation certificates and 1 ribbon for each registered chapter competitor.</p>
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You'll also get access to electronic resources. The following resources are available to coaches online at [www.mathcounts.org/coaches](http://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](mailto:info@mathcounts.org) to make sure we have your correct email address.*

<p><b>Official 2018 MATHCOUNTS School Competition</b> Released in November 2017 Includes all 4 test rounds and the answer key</p>	<p><b>2017 MATHCOUNTS School, Chapter + State Competitions</b> Released by mid-April 2018 Each level includes all 4 test rounds and the answer key</p>	<p><b>MATHCOUNTS Problem of the Week</b> Released each Monday Each multi-step problem relates to a timely event</p>
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You can use the **2018 MATHCOUNTS School Competition** to choose the students who will represent your school at the Chapter Competition. Sometimes coaches already know which students will attend the Chapter Competition. If you do not need the School Competition to determine your chapter competitors, then we recommend using it as an additional practice resource for your students.

The **2017-2018 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 4 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. 8 of this book, but below are the sections that you'll use the most when coaching your students.

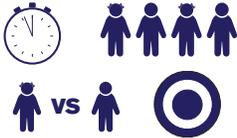
- **Handbook Problems:** 250 math problems divided into Warm-Ups, Workouts and Stretches. These problems in-



crease in difficulty as the students progress through the book. (pg. 11)

- **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. 56)
- **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. 49)
- **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. 53)

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;"><b>Warm-Ups</b></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 and Countdown Rounds.</i></p> <div style="text-align: center;">  </div>	<p style="text-align: center;"><b>Workouts</b></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 and Team Rounds.</i></p> <div style="text-align: center;">  </div>	<p style="text-align: center;"><b>Stretches</b></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 4 rounds.</i></p> <div style="text-align: center;">  </div>
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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 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 School and Chapter Competition approach.

<p><b>Mid-August – September 2017</b></p> <p>Warm-Ups 1, 2 + 3 Workouts 1 + 2</p>	<p><b>October 2017</b></p> <p>Warm-Ups 4, 5 + 6 Workout 3 Probability Stretch</p>	<p><b>November 2017</b></p> <p>Warm-Ups 7 + 8 Workouts 4 + 5 Patterns Stretch</p>	<p><b>December 2017</b></p> <p>Warm-Ups 9, 10 + 11 Workout 6 Travel Stretch</p>
<p><b>January 2018</b></p> <p>Warm-Ups 12, 13 + 14 Workouts 7 + 8 <i>2018 MATHCOUNTS School Competition</i> <i>Select chapter competitors (optional at this time)</i></p>		<p><b>February 2018</b></p> <p>Practice Competition: 2017 School Competition Practice Competition: 2017 Chapter Competition <i>Select chapter competitors (required by this time)</i> <i>2018 MATHCOUNTS Chapter Competition</i></p>	

You'll notice that in January or February you'll need to select the 1-10 student(s) who will represent your school at the Chapter Competition. This must be done before the start of your local Chapter Competition. You'll submit the names of your chapter competitors either online at [www.mathcounts.org/coaches](http://www.mathcounts.org/coaches) or directly to your local Chapter Coordinator.

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](http://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 Problem of the Week, 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 Problem of the Week 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 Problem of the Week, 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 Problem of the Week 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
- Use the **Problem of the Week** (posted online every Monday)
- Practice working in groups to develop teamwork (and to prepare for the Team Round)
- 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 Problem of the Week (20 minutes)*

- Have 1 student come to the board to show how s/he solved the first part of the problem.
- Discuss as a group other strategies to solve the problem (and help if student answers incorrectly).
- Have students divide into groups of 4 to discuss the solutions to the remaining parts of the problem.
- Have 2 groups share answers and explain their solutions.

### *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 (25 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 45 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 45 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) 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 your school's website.
  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 (703) 299-9006 or [info@mathcounts.org](mailto:info@mathcounts.org).**

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**Coach Resources: [www.mathcounts.org/coaches](http://www.mathcounts.org/coaches)**