



# Math Is Cool 2013-2014 Competition Schedule

Grade Level	Competition Date	Registration Deadline
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## Spokane, Seattle, & Vancouver

High School	SEA - October 18 <sup>th</sup> SPO/VAN - Oct. 23 <sup>rd</sup> (Wed.)	September 27 <sup>th</sup>
7 <sup>th</sup> /8 <sup>th</sup>	November 8 <sup>th</sup>	October 11 <sup>th</sup>

## Spokane, Seattle, Wenatchee, Vancouver, & Tri-Cities

6 <sup>th</sup>	February 7 <sup>th</sup>	January 10 <sup>th</sup>
5 <sup>th</sup>	March 7 <sup>th</sup>	February 7 <sup>th</sup>
4 <sup>th</sup>	April 18 <sup>th</sup>	March 21 <sup>st</sup>

## Masters (Moses Lake)

High School, 7/8 <sup>th</sup>	December 7 <sup>th</sup> , 2013	High School - Nov. 5 <sup>th</sup> 7/8 <sup>th</sup> - Nov. 15 <sup>th</sup>
4 <sup>th</sup> , 5 <sup>th</sup> , 6 <sup>th</sup>	May 17 <sup>th</sup> , 2014	6 <sup>th</sup> - Feb. 21 <sup>st</sup> 5 <sup>th</sup> - March 21 <sup>st</sup> 4 <sup>th</sup> - April 30 <sup>th</sup>

## Contact Information

Registration:	Annie Bouscal "Academics Are Cool"	(509) 738-7000 2447 Pierre Lake Road, Kettle Falls, WA 99141	<a href="mailto:Registrar@academicsarecool.com">Registrar@academicsarecool.com</a>
Regional Directors:			
Moses Lake	Triscia Hochstatter	(509) 766-2650x2780	<a href="mailto:MosesLake@academicsarecool.com">MosesLake@academicsarecool.com</a>
Seattle	Tom Tosch	(206) 824-8948	<a href="mailto:Seattle@academicsarecool.com">Seattle@academicsarecool.com</a>
Spokane	Gregg Sampson	(509) 951-6521	<a href="mailto:Spokane@academicsarecool.com">Spokane@academicsarecool.com</a>
Tri-Cities	Chris Johnson	(509) 371-7096	<a href="mailto:Richland@academicsarecool.com">Richland@academicsarecool.com</a>
Vancouver	Mahen Malixi	(360) 300-6700	<a href="mailto:Vancouver@academicsarecool.com">Vancouver@academicsarecool.com</a>
Wenatchee	Mary Nordt	(509) 470-2037	<a href="mailto:Wenatchee@academicsarecool.com">Wenatchee@academicsarecool.com</a>
See the <a href="http://www.academicsarecool.com">www.academicsarecool.com</a> website for specific contest locations and addresses.			



# About Math Is Cool

## What is Math Is Cool?

Math Is Cool is a mathematics competition facilitated by the 503c organization Academics Are Cool for students in 4<sup>th</sup> through 12<sup>th</sup> grades in the state of Washington and surrounding communities. Contests are presented at regional-level "Math Is Cool Championships" events, from which top-scoring schools are invited to send a team of four to the state-level "Math Is Cool Masters" contest.

The competition consists of six events:

- Mental Math
- Multiple Choice Test
- Relay or Pressure Round
- Individual Test
- Team Test
- College Bowl

The individual test and mental math (and at higher grade levels, the multiple choice test) events are performed individually, while the other events are collaborative team events. Detailed rules and prior-year tests are available online at [www.academicsarecool.com](http://www.academicsarecool.com).

## Awards

- All participants receive a "Math Is Cool" participation award.
- The top scoring individual from each school receives a prize.
- Individual awards: 1<sup>st</sup> - n<sup>th</sup> place trophies for Division I & II (large & small school districts)
- Team awards: 1<sup>st</sup> - n<sup>th</sup> place plaques for Division I & II

For every six group-of-four teams registered in each division, one school award and two individual awards will be given, with a maximum of 5 school awards and 10 individual trophies. Event raw scores are combined with weighted scaling factors to give the school scores. If you bring more than one group-of-four from your school, your school score will be based on the highest score attained in each event by any group-of-four from your school.

## Registration

Registration is completed online at [www.academicsarecool.com](http://www.academicsarecool.com) by creating an account and filling in the registration form. A welcome packet with a final schedule of events, logistical information, and other key information/reminders will be e-mailed to you about 2 weeks prior to the contest. ***By two weeks prior to the competition at the latest, coaches must submit the names of the students who will be attending in the online form.*** In addition to the registered teams (groups of four), schools are allowed to bring a maximum of two "alternates" to a Math Is Cool Championships contest (but not Masters) at no additional charge. Please do not register the "alternates" as individuals.

**Fees: \$10 registration fee per grade, plus:**

**\$45 per team-of-four**

**\$15 purchase order fee (only if sending PO as payment)**

**For an individual competing on own (not on a team): \$15**

***All fees are non-refundable two weeks before the competition.*** Please make checks out to "Academics Are Cool." Checks are preferred. However, purchase orders are accepted, if it is necessary; please include the \$15 PO fee if paying by PO.

For more information, please check out the website [www.academicsarecool.com](http://www.academicsarecool.com) or contact the registrar, Annie Bouscal, at 509-738-7000.



# Register for Math Is Cool

Registration takes just a few steps.

1. Start by going to the Math Is Cool website at <http://www.academicsarecool.com>. If this is your first visit to the website you will need to create an account before you can log in and begin the registration process. Click on the "Create Account" link in the menu on the left side of the page. Fill in the form that comes up, then click the "Create Account" button at the bottom. You should get an e-mail within 10 minutes verifying that the account was successfully created. Save your login information in a safe place for future use!
2. Once you have an account, log in using the e-mail address and password you specified when creating your account.
3. Click the "Register Team" link in the menu on the left side of the page. Fill in the school, grade, division, contact info., etc. on the form that is presented (see example below). After verifying your information, click on the "Submit Team Registration" button at the bottom of the form. Please submit registrations only once.
4. An automated e-mail will be sent to you to confirm that the registration is entered into the system. About 3 weeks prior to the contest date, you will receive a welcome packet via e-mail with key information on schedule, etc. You can access an invoice for your registration via the "View Invoices" item in the left-side menu.
5. As soon as possible, but no later than 2 weeks prior to the contest, enter the student names for the contest (using the "Enter Names" link in the left-side menu).

If you have any questions or concerns, contact the webmaster, the registrar (Annie Bouscal), or your regional director.

**Math Is Cool**

Create Account

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Create Account  
Competition Dates  
Locations  
Sample Schedule  
Masters Schedule  
Fees  
Rules  
FAQ  
History  
Contact  
Past Tests/Results  
Coach Tools  
Register Team

**Create an Account**  
To create an account fill out the following information:

E-mail Address:   
E-mail Again:   
Password:   
Password Again:   
(note: this password may be accessible by our administrators to help with account recovery)

Optional Personal Contact Information:  
This information will be made available to you as you fill in other forms.

Your Name:   
Your Mailing Address:   
    
(City) (State) (Zip)  
Your Phone Number (ex. 206-555-1234 x 33):

**Math Is Cool**

Register Teams

You are logged in as Someone@somewhere.com. [Logout](#)

Home  
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Masters Schedule  
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Coach Tools  
Register Team  
Edit Registrations  
Register an Individual  
Enter Names  
View Invoices

**Note New Rule:** Any student may compete as an individual in their grade level or any higher grade; however, a student may compete as a team at one grade level only. This applies to both Championships and Masters.

Also note each team includes four students in addition to two alternates per school that can compete as individuals. So when registering n teams, you get to bring 4n+2 students along. These students don't need to be registered as individuals separately.

Competition Location:   
Competition Level:   
School Registering:   
Coach:   
School Division - See below for details on division level:   
Number of 4th, 5th, 6th, 7th or 9-10 Teams:   
Number of 8th or 11-12 Teams:   
School Address:   
School City:   
School State:   
School Zip:   
Contact Phone:   
Contact FAX:   
Contact Email (who will be bringing the students):   
Paying via PO (\$10 billing fee):

## Example Math Is Cool Problems

2	Ben received an 87%, 93%, 94%, and an 80% on four tests. What is the minimum percentage that Ben must get on the next test to have an average of 90% over the five tests?	4 <sup>th</sup> grade
3	How many 7-digit phone numbers are possible if the first three digits must be odd & the last digit must be prime?	4 <sup>th</sup> grade
4	If the number of bacteria on a kitchen sink doubles every 5 minutes, then how many bacteria would there be in 15 minutes, given that there was 1 bacterium initially?	4 <sup>th</sup> grade
5	An apartment currently rents for seven hundred fifty dollars a month. The monthly rent is expected to increase fifteen dollars every twelve months. What will the monthly rent be at the end of five years, in dollars?	4 <sup>th</sup> grade
6	The ratio of boys to girls on the math team is 5 to 3. If they can get three more girls to join, the ratio of boys to girls would be ten to seven. How many kids are currently on the math team?	5 <sup>th</sup> grade
7	Express $11011_2$ as a base 10 number.	5 <sup>th</sup> grade
8	There are five light switches in a room, each of which can either be on or off. How many different ways can the switches be positioned?	6 <sup>th</sup> grade
9	Colin can mow a yard in one hour. Lee can mow the same yard in two hours. How long, in hours, will it take the two of them to mow the same yard working together?	6 <sup>th</sup> grade
12	A standard die is rolled three times. What is the probability that a prime number is rolled on exactly one of the three rolls?	7 <sup>th</sup> grade
13	Solution A is a solution of water and hydrochloric acid and is 70% water. How many liters of water should be added to 30 liters of solution A to create a solution with 20% hydrochloric acid?	7 <sup>th</sup> grade
14	Three people (A, B, and C) are suspects in an investigation and made the following statements. If exactly one statement is true, who committed the crime, A, B, or C?  A: B is innocent.                      B: I'm guilty.                      C: A is innocent.	8 <sup>th</sup> grade

## Solutions to the Example Math Is Cool Problems

2	$(87 + 93 + 94 + 80 + x) / 5 = 90 \rightarrow 354 + x = 90 \cdot 5 = 450 \rightarrow x = 450 - 354 = \underline{96}$
3	Denote how many choices you have for each digit in the number. There are 5 odd digits and there are 4 prime digits. So, there are 5 ways to have an odd digit, 10 ways to have any digit, and 4 ways to have a prime digit. The number of possible phone numbers is the product of the number of ways to choose each digit: $5 \cdot 5 \cdot 5 \cdot 10 \cdot 10 \cdot 10 \cdot 4 = 125 \cdot 4 \cdot 1000 = \underline{500000}$ .
4	This is not strictly a "drt" problem, but it involves the rate of growth in terms of doubling time. Divide the total time by the doubling time: $15 / 5 = 3$ . Then double the initial quantity 3 times: $1 \cdot 2 \cdot 2 \cdot 2 = 1 \cdot 2^3 = \underline{8}$ .
5	Understanding the nature of money, payments, interest, etc. is important. This problem is slightly tricky in that the intent (not stated explicitly) is that the rent increases at the first of the year. So the first year is \$750/mo., second year is \$765/mo., etc. Thus, the answer is found as: $750 \text{ \$/month} + 15 \times 4 = \underline{810} \text{ \$/month}$
6	Students must understand part to whole (fraction) versus part to part (ratio) relationships. Here there are blocks of 8 students initially and blocks of 17 after 3 girls join. So you need a multiple of 8 plus 3 that is a multiple of 17. Look at 34 first (fails), then 51 (works, $51 - 3 = 48 = 8 \cdot 6$ ). Answering the question that was asked: <u>48</u> .
7	Remind students what place value means and how it can be used in such "base" problems. $1 + 2 + 8 + 16 = \underline{27}$
8	There are 2 ways to choose the position of each switch, so the five switches can be positioned in: $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 2^5 = \underline{32}$ ways
9	Combine the efforts of the two boys. $1 \text{ yard} / 1 \text{ hour} + 1 \text{ yard} / 2 \text{ hours} = \frac{2}{2} + \frac{1}{2} = \frac{3}{2} \text{ yard/hour}$ Take the reciprocal to get the time for one yard: $1 \text{ yard} / (\frac{3}{2} \text{ hour})$ So it takes the two boys $\frac{2}{3}$ hours to mow one yard when working together.
12	The probability that you roll a prime is $\frac{1}{2}$ (primes are 2, 3, & 5) and the probability that you don't roll a prime is thus also $\frac{1}{2}$ . So the probability that you roll a prime, non-prime, and non-prime is the product of the three independent event probabilities: $\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{8}$ . However, there are 3 permutations that fit the criteria: P, N, N or N, P, N or N, N, P. So the total probability is the sum of the probabilities for each permutation: $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} = \underline{\frac{3}{8}}$
13	This problem (indirectly) deals with concentration (quantity per volume) and mixing/dilution. Solution A has 70% water (thus 30% acid, so out of 30 L of Solution A, 9 L are acid. In the new solution it is 20% acid so $9 \text{ L} = 0.2 \times V_{\text{new}} \rightarrow V_{\text{new}} = 45$ . The difference in volume is $45 - 30 = \underline{15}$ L of water added.
14	It can be easy to get turned around or lost when thinking about logic problems. Here, being organized can help. Start by supposing that statement A is true. Then, statements B and C must be false (per the 'only one is true' criterion), which leads to A being guilty. If B is true, then A and C are false, which leads to a contradiction between statement B and the opposite (negation) of statement C. If C is true, then A and B are false, which leads to a contradiction between the opposite of A and the opposite of B. Therefore, A must be the true statement and person <u>A</u> is guilty.