



# 2015 Academic Challenge Coach's Guide

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## The Academic Challenge Process

Academic Challenge is a battery of tests created by the Worldwide Youth in Science and Engineering (WYSE) program offered to high school students. Subjects tested are biology, chemistry, computer science, engineering graphics, English, mathematics and physics.

More than 40 community colleges and universities in Illinois and Missouri provide sites for the tests. The tests are designed to present a challenge to the states' brightest students. They are presented in multiple-choice format and students have 40 minutes to complete tests that range in length from 30 questions (computer science) to 100 questions (English).

The test material is drawn from high school senior and college freshman curricula to present a bridge between secondary and higher education. Tests are written by teams of faculty members at colleges and universities in Illinois, Missouri, Georgia, Tennessee, and Michigan. Each team produces sets of tests that increase in level of difficulty in a progression from regional, to sectional, to state finals.

This Coach's Guide is for the use of the Academic Challenge coaches. Additional information concerning the Academic Challenge program is available on the WYSE website at <https://wiki.engr.illinois.edu/display/wyse/WYSE+Academic+Challenge>

WYSE is located on the campus of the University of Illinois at Urbana-Champaign and is a unit of the College of Engineering.

### Guiding Philosophy of the Academic Challenge

The goal of Academic Challenge is to acquaint high school students with the course content and the level of competition that they will experience upon entering a science or engineering curriculum at the college or university level. Consequently, the test content will challenge the brightest students.

### 2015 Competition Dates

#### Regional Testing Window

February 1-15, 2015

#### Sectional Testing Window

March 1-16, 2015

#### Missouri State Finals

TBD

#### Illinois State Finals – To be held at the I-Hotel and Conference Center

Division	Date
Unlimited	April 13, 2015
1500	April 14, 2015
700	April 15, 2015
300	April 16, 2015

## Procedures for Testing at Alternate Site

Schools that find it impossible to test at their regular regional or sectional site due to a scheduling conflict may petition to test at an alternate site (on the regularly scheduled date of competition for the alternate site). The procedure for petitioning consists of the following steps:

- 1) Obtain permission from the WYSE office.
- 2) Obtain permission from the original site. (Site coordinator must notify WYSE office as to whether or not permission has been granted.)
- 3) Obtain permission from the alternate site. (Site coordinator must notify WYSE office as to whether or not permission has been granted.)

The coordinator at the alternate site must isolate the answer sheets produced by the alternate testers and forward those sheets or those scores to the WYSE office. The WYSE office will compare those scores with the scores from the original site and determine if the team advances or if any of the students advance to the next level of competition. At no time do these alternate scores affect the results from the original site or the alternate site. The alternate testers are eligible for advancement only, no medallions or trophies will be awarded.

## Translation Dictionaries

Foreign Exchange students are allowed to use non-electronic translation dictionaries for tests other than the English test. Permission must be obtained from the WYSE office prior to the first competition, and the WYSE office will notify each site coordinator in advance that the student will be bringing a dictionary to the test. Electronic translation dictionaries are not allowed in the testing room.

## Late Arrivals to State Finals

Students must arrive in time to find their seats, listen to instructions, and have their answer sheets correctly encoded prior to the scheduled start of the first test. Answer sheets will be included in the packet received at the check-in desk at the state competition. Coaches must arrive in time to distribute tests to their students. Students who arrive in the testing area with insufficient time to be fully prepared and ready to begin testing at the announced time must wait for the second test period, and will be allowed to take only one test during the second test period. Under no circumstances will provisions be made for students to take the missed exam after the second testing period.

## Individual Advancers – Reinforcement of Existing Rules

Individual competitors (either at-large competitors or members of teams) will qualify to advance if they attain a subject score equal to or better than the second-place score for that subject in their division. This qualification for advancement attaches to the specific competitor and therefore at-large competitors who advance to the next level or individual members of teams who advance when their team does not advance **cannot be replaced** by other students.

## Wild Card Advancement

There will be a wild card playoff for both the regional and sectional competitions. One team from each division will advance as the wild card winner at both the regional and sectional levels. The winners will be determined at the end of each level of competition.

## Ordering State Finals T-Shirts

If you wish to purchase a State Finals t-shirt, you must pre-order them – there will be no extra t-shirts available at the competition. Payment is not required until the day of your competition. T-shirt order forms will be included in the state finals advancement packet and will also be available on our web page.

## Academic Challenge Calculator/Testing Rules

Calculator usage at all levels of the Academic Challenge competition will follow the guidelines used in the ACT, SAT, and Prairie State Achievement Exam. As in past years, calculators are allowed on the math, physics, and chemistry tests only.

- Examinees must bring their own calculators and may not share calculators.
- Only one calculator per student is allowed.
- Each competitor is responsible for his/her own calculator.
- Testing site staff will not have extra batteries or calculators.
- An acceptable calculator includes any four-function, scientific, or graphing calculator, as long as it doesn't have any of the prohibited features (see **prohibited** list below).

### The following calculators and types of calculators are prohibited:

- Calculators with built-in computer algebra systems. Calculators in this category include:
  - ⇒ **Texas Instruments:** All model numbers that begin with **TI-89** or **TI-92**, and the **TI-Nspire CAS** (the non-CAS TI-Nspire is permitted)
  - ⇒ **Hewlett-Packard:** **HP 48GII** and all model numbers that begin with **HP 40G**, **HP 49G**, and **HP 50G**
  - ⇒ **Casio:** **Algebra fx 2.0**, **ClassPad 300** and **ClassPod 330**, and all model numbers that begin with **CFX-9970G**
- Handheld, tablet, or laptop computers, including PDAs
- Electronic writing pads or pen-input devices (Sharp EL 9600 is permitted)
- Calculators built into cell phones or other wireless communication devices
- Calculators with a typewriter keypad (QWERTY format)
- Calculators with paper tape and/or that make noise
- Calculators that can communicate wirelessly with other calculators
- Calculators that have power cords

### Competitors will be dismissed from the test and their answer sheets not scored if they are found:

- using unauthorized calculators;
- using the calculator's memory to store any test materials;
- using any device to share or exchange information at any time during the tests or during break (All electronic devices, including cellular phones and pagers, must be turned off from the time the competitor is admitted to test until dismissed after testing concludes.);
- removing any part of a test book or any notes relating to the test from the test room;
- creating a disturbance or allowing an alarm, pager, or phone to sound in the testing room.

## Calendar for 2014-2015

October 1	WYSE office mails registration materials to all secondary schools in Illinois, addressed to WYSE Coach or Math/Science Department.
December 15	Deadline for competing schools and home-schooled individuals to register with the WYSE office. Registrations can be completed on-line, returned by fax, or mailed with a check made payable to the University of Illinois.
January 15	Registration fees due in WYSE office.
February 1-15	Regional competition window. Sites not using the WYSE software must report competition results to the WYSE office within three business days of test date. Regional sites give advancement packages to schools advancing to the sectionals. Advancing schools must register with their sectional site.
February 20	Regional tests, answer keys, and solution sets should be available from the WYSE office by this date.
March 1-16	Sectional competition window. Sites not using the WYSE software must report competition results to the WYSE office within three business days of test date. Sectional sites give advancement packages to schools advancing to state finals. Advancing schools must register with the WYSE office in order to compete in the state finals competition.
March 25	Sectional tests, answer keys, and solution sets should be available from the WYSE office by this date.
March 30	Deadline for advancing schools (teams and individuals) to register for Illinois State Finals.
April 13-16	<b>Illinois state finals</b> , held at the Illini Union, University of Illinois Urbana campus.
TBD	<b>Missouri state finals</b> , held at the Missouri University of Science and Technology.
April 24	State finals tests, answer keys, and solution sets should be available from the WYSE office by this date.

# Participation

## Cost to Participate

### Registration Fees

Varsity team	\$17.00 per student or \$228.00 for a team of 14 members
At-large competitors	\$17.00 per student
Junior varsity	\$6.00 per student

### Surcharges

If a site finds it necessary to add a surcharge to help defray the cost of awards as specified in the WYSE rules for the competition, attending schools are not allowed to opt out of this charge.

Site coordinators may add a surcharge to the base fee to defray the cost of lunches, t-shirts, or other locally generated costs. Schools should be allowed to opt-out of these site-arranged lunches, t-shirts, etc. and provide for themselves less expensive alternatives.

### How to Register and Pay

- 1) Register with the WYSE office by December 15, 2014 [on-line from our web page at <https://wyse.engr.illinois.edu/wyse2015/register-for-regionals.htm> (preferred method), fax, or U.S. mail].
- 2) Payment must be received in the WYSE office by January 15, 2015. Pay by credit card by going to <https://my.engr.illinois.edu/eventreg/register.asp> or send a check made payable to the University of Illinois.

### School Competitive Divisions

All public and private schools offering courses for 9<sup>th</sup> through 12<sup>th</sup> grades are eligible to compete. Division of competition is determined by enrollment as of 9/30 of the current year. Home-schooled students are eligible to compete as at-large competitors in the division of their local public school or as members of their local school team if this is agreeable to the school.

Division 300	enrollment equal to or less than 300
Division 700	enrollment from 301 through 700
Division 1500	enrollment from 701 through 1500
Division Unlimited	enrollment greater than 1500

### Number of Tests per Team

To be eligible for team awards, a school must have at least two test scores in each of five subject areas, three of which are mandatory. The mandatory subject areas are English, math, and chemistry. The remaining two subject areas can be selected from the following: biology, computer science, engineering graphics, and physics. Schools can elect to compete in more than five subject areas (i.e., six areas or all seven subject areas).

Schools may send individual students (at-large competitors) without sending a team or in addition to a team. These students are eligible for subject awards and individual advancement.



## Participation Options

Schools may enter teams (one team per school) and/or at-large competitors.

### Varsity Team

The varsity team is composed of between 6 and 14 students who must be registered as full-time students at the school. Teams may substitute or replace members from the regional to sectional and/or sectional to state finals competition. A team may also drop members as long as they still have at least 6 members, but the number of team members cannot be increased beyond the number registered at the regional level.

Exchange students enrolled as full-time students are eligible for the team and the competition **provided they are not over 18 and they have not graduated from secondary school in their home country.**

### At-Large Competitors

This category is for full-time students who compete as individuals and are not on a school team. This includes situations where a school competes with fewer than 6 students, and situations where a school competes with individuals in addition to a team. Home-schooled students are eligible to compete as at-large competitors in the division of their local public school.

### Junior Varsity

Junior varsity (JV) participants compete only at regional and sectional sites that allow them to participate. Junior varsity participants choose which tests they take and compete for practice purposes only. Junior varsity answer sheets do not have to be scored. JV participants are not eligible for awards or advancement. Junior varsity participants are not allowed at state finals.

**Note:** Academic Challenge coaches must contact their competition site to determine if junior varsity participants are allowed. Not all regional or sectional sites allow junior varsity participants.

## Advancement

### *Team Advancement*

The number of teams advancing (regional to sectional or sectional to state finals) is determined by the following rule.

Within each division (300, 700, 1500, unlimited), if there are:

1 or 2 teams, both advance

3 – 7 teams, 2 advance

8 – 12 teams, 3 advance

13 – 16 teams, 4 advance

More than 16 teams, 5 advance

### *Individual advancement from the regional to sectional competition*

Individual competitors (either at-large competitors or members of teams) will qualify to advance if they attain a subject score equal to or better than the second-place score for that subject in their division. There is no limit on the number of individual competitors who may advance. For example, if two students are tied for first place and three tied for second place, all five students will qualify to advance because they finished "in either 1st or 2nd place."

These advancement rules also apply to individual members of teams whose team does not advance.

**Note:** Although the individuals with the three highest scores in a subject and within a division receive medallions, only the top two qualify to advance.

### *Individual advancement from the sectional to the state final competition*

Individual competitors (either at-large competitors or members of teams) will qualify to advance if they attain a subject score equal to or better than the second-place score for that subject in their division, **or** if they meet or exceed the State Finals Qualifying Scores listed on following page. These advancement rules also apply to individual members of teams whose team does not advance. The table on the next page represents our best estimate of competitive qualifying scores.

In situations where teams or individuals compete outside of their division, regardless of how divisions are grouped at the previous level of competition, they must advance by division as determined by school enrollment. For example, if there is only one unlimited school with a team or individuals at a site and it competes against teams and individuals in division 1500, the unlimited school cannot "bump" a 1500 team or individuals from advancing.

At either stage of advancement, a group of students from a given school who qualify to advance as individuals, but whose team did not advance, are not eligible to compete as a team even if they technically satisfy the criteria for team participation.

## 2015 State Finals Qualifying Scores for Advancement from Sectional to State Finals Competition

<b>Subject</b>	<b>Division</b>	<b>Qualifying Scores</b>
Biology	300	35
	700	35
	1500	39
	Unlimited	39
Chemistry	300	22
	700	22
	1500	25
	Unlimited	30
Computer Science	300	20
	700	25
	1500	25
	Unlimited	26
Engineering Graphics	300	23
	700	27
	1500	27
	Unlimited	29
English	300	66
	700	74
	1500	75
	Unlimited	75
Math	300	20
	700	24
	1500	28
	Unlimited	31
Physics	300	20
	700	23
	1500	24
	Unlimited	29

# Scoring

## Varsity Team

1. Separate each team according to division. Scores are calculated within each division.
2. Scores should be calculated by subject first and then by team.
3. For each team, add the two highest scores for each subject. The sum of the two highest scores in each subject is that team's raw score for that subject. If a team has only one score for a particular subject, the team's score is zero for that subject.
4. Compare the raw scores of all schools within a division. Determine the highest raw score for each subject within each division. Divide the highest raw score for each subject within each division into 100. The resulting quotient is the normalizing constant for that particular subject within that particular division. The normalizing constant serves to equalize each subject's contribution to the final varsity team score, regardless of the number of questions on the test.  
*Note:* Normalizing constant =  $(100 / \text{highest raw score for the subject from all schools in the division})$ .
5. Multiply each raw score by the normalizing constant for that subject in that division; the result is the normalized score.  
*Note:* Normalized score = raw score x normalizing constant.
6. Total the normalized scores for each team. The team score is the sum of the three mandatory subjects (chemistry, English, and math) plus the sum of the highest two remaining subjects.
7. Round the score to the nearest whole number. This is the team's final varsity team score.

## At-large Competitors

At-large competitor scores do not affect team scores.

## Junior Varsity

Junior varsity participants do not score and do not advance.

## Worldwide Youth in Science and Engineering Academic Challenge VARSITY TEAM ROSTER and SCORING SAMPLE

Division of Testing      300     700     1500     Unlimited

Testing Site \_\_\_\_\_ Site Coordinator \_\_\_\_\_

School \_\_\_\_\_

School Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Coach \_\_\_\_\_ Phone: \_\_\_\_\_

Email Address \_\_\_\_\_

Student Name	Biology	Chemistry	Computer Science	Engineering Graphics	English	Math	Physics
1. Apple, Julie	32				90		
2. Black, Sue		21	16				
3. Book, Nicholas						12	
4. Brown, Michelle			19	18			
5. Green, Jenny		32				28	
6. Gray, Phil	39				75		
7. Fish, Doug			20	33			
8. Lake, Lisa	42			26			
9. Ship, Jamie		27					17
10. Storm, Doug		14					
11. Trout, Sam					81	17	
12. White, Leo					96	30	
13. Wright, Joe			22	40			
14.							

Procedures for Scoring	Biology	Chemistry	Computer Science	Engineering Graphics	English	Math	Physics
Raw Score <sup>1</sup>	81	59	42	73	186	58	0 <sup>2</sup>
Normalizing Constant <sup>3</sup>	1.20	1.61	2.27	1.26	.54	1.72	2.86
Normalized Score <sup>4</sup>	97.20	94.99	95.34	91.98	100.44	99.76	0

**The team score is equal to: 94.99 (chem) + 100.44 (English) + 99.76 (math) + 97.20 (biol) + 95.34 (comp sci) = 487.73 (round to 488)**

<sup>1</sup>Add the two highest scores in each column above.

<sup>2</sup>There is only one score for this team in this subject. Thus, the team score in that subject is zero.

<sup>3</sup>As calculated earlier using step 4 on the previous page. (100 / highest raw score for the subject from all schools in the division)

**Note:** The normalizing constant serves to equalize each subject's contribution to the final varsity team score, regardless of the number of questions on the test. In this example, this team's normalizing constant for English and math were highest in this division.

<sup>4</sup>Denotes normalized scores as calculated earlier using step 5 on the previous page.

## Awards

### Team Trophies

At the regional and sectional levels, the three top-scoring teams in each division will be awarded first-, second-, and third-place trophies. In case of ties, duplicate trophies will be awarded.

At the state finals level, the five top-scoring teams in each division will be awarded first- through fifth-place trophies. In case of ties, duplicate trophies will be awarded. Beginning in 2013, trophies will be awarded to the top boundaried and to the top non-boundaried schools in the 300 and 700 divisions at the state level.

### Team Ribbons

Team ribbons are given to members of a varsity team that wins a trophy. Because the trophy will be stored at school, team members receive the ribbons to acknowledge their achievement.

### Medallions

At-large competitors (including home-schooled individuals) compete for medallions along with the individual members of teams within each division.

**Regional level:** Any at-large competitors and/or any individual members of teams who attain the highest, second-highest, or third-highest scores in the subject in each division will receive a first place, second place, or third place medallion, respectively. In case of ties, duplicate medallions will be awarded. (**Remember**, only the top two scores in each subject and in each division advance to the next level.)

**Sectional level:** Any at-large competitors and/or any individual members of teams who attain the highest, second-highest, or third-highest scores in the subject in each division will receive a first place, second place, or third place medallion, respectively. In case of ties, duplicate medallions will be awarded. (**Remember**, only the top two scores in each subject and each division advance to the next level, unless individuals advance by meeting or exceeding the state finals qualifying scores.)

**State finals level:** Any at-large competitors and/or any individual members of teams who attain the highest through the sixth-highest scores in the subject in each division will receive a first place through sixth place medallion, respectively. In case of ties, duplicate medallions will be awarded.

### Participation Ribbons

These ribbons are provided by the WYSE office and are presented to every participant at every level of competition.

# Worldwide Youth in Science and Engineering Academic Challenge

## Sample Agenda

### Site Name

8:30 – 9:30	Registration
9:30 – 10:00	Test Preparation
10:00 – 10:40	Test Period #1
10:40 – 10:45	Collect Exams and Answer Sheets
10:45 – 10:55	Preparation for Test Period #2
11:00 – 11:40	Test Period #2
11:40 – 11:45	Collect Exams and Answer Sheets
11:45 – 1:15	Free Time/Lunch
1:30 – 2:15	Awards Ceremony
2:15	Team Photos

## Worldwide Youth in Science and Engineering Academic Challenge REGIONAL or SECTIONAL VARSITY TEAM ROSTER

Division of Testing      300     700     1500     Unlimited

Testing Site \_\_\_\_\_ Site Coordinator \_\_\_\_\_

School \_\_\_\_\_

School Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Coach \_\_\_\_\_ Phone: \_\_\_\_\_

Email Address \_\_\_\_\_

Student Name	Biology	Chemistry	Computer Science	Engineering Graphics	English	Math	Physics
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							



## Worldwide Youth in Science and Engineering Academic Challenge AT-LARGE COMPETITOR ROSTER

Division of Testing      300     700     1500     Unlimited   
 Testing Site \_\_\_\_\_ Site Coordinator \_\_\_\_\_  
 School \_\_\_\_\_  
 School Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
 Coach \_\_\_\_\_ Phone: \_\_\_\_\_  
 Email Address \_\_\_\_\_

Student Name	Biology	Chemistry	Computer Science	Engineering Graphics	English	Math	Physics
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							