



2013 PhysicsBowl Results

Dear Physics Teachers,

Thank you for having your students participate in this year's AAPT PHYSICSBOWL contest.

This year there were more than 4000 students participating from ~270 schools across the United States, Canada the United Kingdom, China, Spain, and Thailand! Enclosed are lists of the overall top 10 students in each division, the overall top 5 schools in each division, the first and second place schools in each division by region, and the first and second place students in each division by region. Several placings were determined by tie-breakers. For students, the answers were compared from the end of the test forward until the tie was resolved. For schools, the tie was broken by comparing the highest scoring students for each team. Unfortunately, we received answer sheets which were not properly filled with the required information resulting in the student's score being disqualified for consideration of either individual prizes or for the team score. .

This year, the following prizes are awarded:

- To the top overall school in each Division
 - \$100 gift certificate awarded from Pasco Scientific
- To the top 5 overall schools in each Division:
 - \$100 gift certificate awarded from Frey Scientific
 - "PhysicsBowl Champion" T-shirts awarded to the five top students from each school from AAPT.
 - a TI-30 XS MultiView Scientific Calculator awarded from Texas Instruments to the five top students
- To the top two scoring schools in each region/division:
 - \$50 gift certificate awarded from Vernier Software & Technology
 - "PhysicsBowl Champion" T-shirts awarded to the five top students from the *1st* place school in each region from AAPT.
 - A rattleback from Arbor Scientific.

All student winners will receive a copy of "Used Math" from AAPT as well as a TI-30 XS MultiView Scientific Calculator awarded from Texas Instruments. In addition, student winners receive

- To the top 10 overall students (who are then excluded from the Regional Placings):
 - Divisions 01 & 02: A copy of "Particle Physics" from John Wiley & Sons
 - Div. 02 only: A copy of "Electricity and Magnetism" from Cambridge University Press and a book from Princeton University Press
 - Div. 01 only: A copy of "Introduction to Classical Mechanics" from Cambridge University Press.
- To the 1st place students in each Division by Region
 - A Mysterious Glowing Ball from Educational Innovations, Inc.

Finally, additional prizes are awarded to the 2 highest scoring schools in each Division that did NOT finish in the top 2 of their region. This also is true for students in both divisions.

A copy of this year's test along with solutions, as well as individual and team winners can be found at the following web site: <http://www.delta.edu/michaelfaleski/PhysicsBowl>



AAPT PHYSICSBOWL 2013

We had the good fortune of having many wonderful sponsors again this year. We hope to continue our relationship with these companies in the future. One way to ensure that this happens is for teachers to send “thank you’s” to the companies when ordering materials and to use the gift certificates provided. It was learned that as few as $\frac{1}{3}$ of all certificates are cashed in any given year. We hope that you use your certificates to help your physics program in the coming years.

It should be noted that the prizes for the schools in the “highest scoring outside the top 2” are the same as for second place teams in each region and division. Student prizes are awarded in the same way, except that the 2nd place regional winner for the highest scoring student outside the top 2 will also receive 1st place student prizes.

Instructors can obtain the scores of their students from the AAPT website and that link will be provided to you in an email from the national office. Please realize that we were able to retrieve some scores that were disqualified for improperly recording the required information, but this was done after-the-fact. If the information was not encoded correctly, the student was immediately disqualified from winning prizes even though we may be able to link that student to your code now. Some students provided no codes, the wrong regions, no name, just a last name, etc. There are a lot of records and we cannot go back and fill in missing information. While it is unfortunate to disqualify anyone, these are the rules of the contest. Sadly, some very high scores were disqualified. If you still are missing a student’s score... please email jlane@aapt.org or michaelfaleski@delta.edu with student information (CEEB, teacher codes, etc.) and we can try to find the information.

Based on recent trends, the PhysicsBowl Advisory Board will again be looking at the competitive balance in regions. Some regions are really starting to boom as far as the number of schools and we shall see what we can do to make it as fair a playing field as we can. We are doing the best that we can and are not trying to be punitive to any schools. We ask that folks please be patient as we try to tackle a very difficult issue! Regardless, in the near future (2014), regions very well may be revised again.

The statistics from this year's contest are shown below.

Division 01 had an average score of **16.8** (close to last year's average). Statistically, the easiest question was #2 (88.5 % correct) while the most difficult question was #40 (8.0 % correct).

Division 02 was a bit tougher than last year's contest with an average of **15.3**. Statistically, the easiest question was #11 (78.4% correct) while the most difficult question was #49 (9.9 % correct)

The production of a challenging contest of only 40 questions that has a small percentage of very high scores while still not being overly difficult to discourage the majority of students is an enormous task. We will continue to write the best contest that we can and hope to make it even better next year!

Over 28% of the schools that participated this year either won a team prize or had a student win an individual prize.

Statistics for exam

Average Score for Division 01 = **16.8** with a standard deviation of 5.3

Average Score for Division 02 = **15.3** with a standard deviation of 5.5

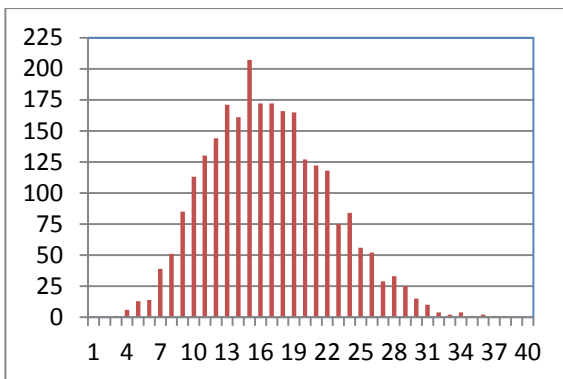


Figure 1. Division 01... # students vs. Score

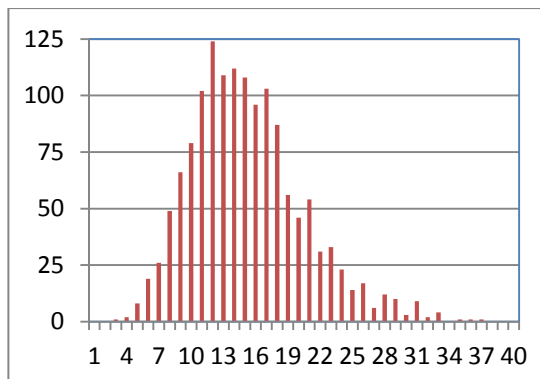
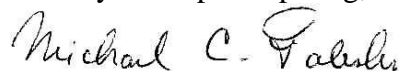


Figure 2. Division 02.... # students vs. Score

We look forward to having you participate in next year's contest... and please let your colleagues at schools near you know about the contest! We are considering how to expand the contest to include more schools and students next year as well as making some more changes with the contest to improve it.

Thank you for participating,



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AAAPT PHYSICS BOWL 2013

PHYSICS EDUCATION

TOP TEN OVERALL DIVISION 01 SCORES

<u>#</u>	<u>Reg</u>	<u>Score</u>	<u>Student</u>	<u>School</u>	<u>City</u>	<u>State</u>
1	01	38	Mike H. Winer	Montgomery Blair HS	Silver Springs	MD
2	13	37	Vinson Luo	University HS-Irvine	Irvine	CA
3	04	36*	Samuel Z. Liu	Millburn HS	Millburn	NJ
4	13	36	Chih-Yuan F. Chiu	Temple City HS	Temple City	CA
5	13	35	Aneesh V. Samineni	The King's Academy	Sunnyvale	CA
6	04	34*	Lisa F. Kong	Manheim Twp Epgy	Lititz	PA
7	13	34*	Chi Yo Tsai	Arcadia HS	Arcadia	CA
8	03	34*	Chris Ni	Ay Jackson Secondary School	Toronto	ON
9	13	34	Tony Jiang	Lynbrook HS	San Jose	CA
10	13	33*	Liwen Ko	Olympia Institute	San Francisco	CA

TOP TEN OVERALL DIVISION 02 SCORES

<u>#</u>	<u>Reg</u>	<u>Score</u>	<u>Student</u>	<u>School</u>	<u>City</u>	<u>State</u>
1	01	37	Kevin Zhou	High Technology HS	Lincroft	NJ
2	12	36	Bobby C. Shen	John Foster Dulles HS	Sugar Land	TX
3	03	35	Henry Wu	Univ of Toronto Schools	Toronto	ON
4	13	33*	Paolo Y. Gentili	Canyon Crest Academy	San Diego	CA
5	04	33*	Yan Huang	West Windsor-Plainsboro HS S	West Windsor	NJ
6	01	33*	Michael Lim	Stuyvesant HS	New York	NY
7	01	33	Alex Bourzutschky	Montgomery Blair HS	Silver Spring	MD
8	01	32*	Youbin Kim	Stuyvesant HS	New York	NY
9	14	32	Rachit Singh	Pullman HS	Pullman	WA
10	13	31*	Eric S. Chen	Canyon Crest Academy	San Diego	CA

Note: Ranking for tied scores is based on the tiebreaker rules... scoring from the end of the test to the front. There were multiple other scores of 31 in Division 02 (and a 33 in Division 01) that did not make the top 10 overall because of the tiebreaks.

Note: These students are recognized as “overall” winners and are removed from the regional winners pool.



AAPT PHYSICS BOWL 2013

PHYSICS EDUCATION

Highest Scoring *Division 01* Students in each Region

<u>Reg</u>	<u>Score</u>	<u>Student</u>	<u>School</u>	<u>City</u>	<u>State</u>
01	31	Mark W. Sabini	Bergen County Academies	Hackensack	NJ
02	31	Angus L. MacMullen	Hopkins School	New Haven	CT
03	32	Zhongyi Wei	Don Mills Collegiate Inst	Toronto	ON
04	33	Keon Ho Lim	Millburn HS	Millburn	NJ
05	27	Matthew D. Zheng	William G. Enloe HS	Raleigh	NC
06	31	Yash Chandramouli	Northview HS	Duluth	GA
07	30	Jaydeep Singh	Lancaster HS	Lancaster	OH
08	29	Willie Zhu	Carmel HS	Carmel	IN
09	29*	Steven P. Zheng	Libertyville HS	Libertyville	IL
10	32	Roy H. Zhao	Edina Center for Acad. Exc	Eden Prairie	MN
11	28*	Erik W. Blokland	Oak Ridge HS	Oak Ridge	TN
12	30	Edward Nguyen	Paschal HS	Fort Worth	TX
13	32	Jerry T. Li	Arcadia HS	Arcadia	CA
14	32	Lingdi Cai	Cambridge Int Cnt of Shanghai Normal University	Shanghai	China

Second Highest Scoring *Division 01* Students in each Region

<u>Reg</u>	<u>Score</u>	<u>Student</u>	<u>School</u>	<u>City</u>	<u>State</u>
01	30*	Kelvin Wang	Bergen County Academies	Hackensack	NJ
02	30*	Jackson C. Macor	Guilford HS	Guilford	CT
03	31	Stephen Liu	Bayview Secondary Schools	Richmond Hill	ON
04	31*	Christopher Shao	West Windsor-Plainsboro HSN	Plainsboro	NJ
05	26*	Gregory T. Hare	South River HS	Edgewater	MD
06	30*	Sommy Khalaj	Walton HS	Marietta	GA
07	29	Aric G. Floyd	Hawken School	Gates Mills	OH
08	27	Helena Ma	Carmel HS	Carmel	IN
09	29*	Jack Baumruk	Libertyville HS	Libertyville	IL
10	28	Apekshya Panda	Wayzata HS	Plymouth	MN
11	28	Benjamin R. Mobley	Oak Ridge HS	Oak Ridge	TN
12	29	Jeffrey J. Zhang	William P Clements HS	Sugar Land	TX
13	31*	Albert J. Tung	University HS – Irvine	Irvine	CA
14	31*	Jiage Lv	Gao Xin No 1 HS	Xi'An	China

Highest Scoring *Division 01* Students outside the top 2 of their Region

<u>Reg</u>	<u>Score</u>	<u>Student</u>	<u>School</u>	<u>City</u>	<u>State</u>
13	31*	Tony Li	Arcadia HS	Arcadia	CA
14	31*	Jan A. Tache	New Westminster Second. Sch	New Westminster	BC

* = place determined by tiebreaker



AAPT PHYSICS BOWL 2013
PHYSICS EDUCATION

Highest Scoring *Division 02* Students in each Region

<u>Reg</u>	<u>Score</u>	<u>Student</u>	<u>School</u>	<u>City</u>	<u>State</u>
01	31	Eric D. Schneider	High Technology HS	Lincroft	NJ
02	31	David M. Meyer	King and Low-Heywood Thomas Sch.	Stamford	CT
03	29*	Renhao Wang	Marc Garneau C.I.	Toronto	ON
04	31*	Michael J. Seaman	Home School	Short Hills	NJ
05	29	Gautam R. Nagaraj	Raleigh Charter HS	Raleigh	NC
06	31	Edward S. Park	Walton HS	Marietta	GA
07	27	Shivam B. Sarodia	Centerville HS	Centerville	OH
08	31	Kevin C. Fei	Carmel HS	Carmel	IN
09	28	Licheng Zhu	Adlai Stevenson HS	Lincolnshire	IL
10	23*	Maxwell B Strange	Arrowhead HS	Hartland	WI
11	26	Harrison Garrett	Clayton HS	Clayton	MO
12	31	Dominic J. Yurk	Paschal HS	Fort Worth	TX
13	30	Kevin F. Zhu	The Harker School	San Jose	CA
14	30	Eddie H. Wang	Westview HS	Portland	OR

Second Highest Scoring *Division 02* Students in each Region

<u>Reg</u>	<u>Score</u>	<u>Student</u>	<u>School</u>	<u>City</u>	<u>State</u>
01	29	Richard B. Yip	Stuyvesant HS	New York	NY
02	28	Elijah H. Gunther	Cambridge Rindge and Latin School	Cambridge	MA
03	29	Yuan Yao	Colonel by Secondary School	Gloucester	ON
04	31*	Brice Huang	West Windsor-Plainsboro HS N	Plainsboro	NJ
05	24	Yang R. Xu	Middleburg Academy	Middleburg	VA
06	26	Lexie L. Krehbiel	West Short Jr/Sr HS	Melbourne	FL
07	25	Alexander W Hamlin	Beavercreek HS	Beavercreek	OH
08	24	Joshua Segaran	Carmel HS	Carmel	IN
09	26*	Daniel E. Schwartz	Deerfield HS	Deerfield	IL
10	23	Stephen M Osowski	Arrowhead HS	Hartland	WI
11	23	Alexander R Owen	Ridgeview Classical Schools	Fort Collins	CO
12	29	Daniel L Fan	John Foster Dulles HS	Sugar Land	TX
13	29*	Rahul Sridhar	The Harker School	San Jose	CA
14	26	Jingli Zhang	WHBC of Wuhan For. Lang Sch	Wuhan	China

Highest Scoring *Division 02* Students outside the top 2 of their Region

<u>Reg</u>	<u>Score</u>	<u>Student</u>	<u>School</u>	<u>City</u>	<u>State</u>
04	31	Chaitanya Asawa	West Windsor-Plainsboro HS S	West Windsor	NJ
04	30	Rishabh Pipada	West Windsor-Plainsboro HS N	Plainsboro	NJ

* = place determined by tiebreaker



TOP FIVE OVERALL DIVISION 01 TEAM SCORES

<u>#</u>	<u>Reg</u>	<u>Score</u>	<u>School</u>	<u>City</u>	<u>State</u>
1	04	<i>156</i>	Millburn HS	Millburn	NJ
2	13	<i>151</i>	Arcadia HS	Arcadia	CA
3	13	<i>149</i>	University HS – Irvine	Irvine	CA
4	14	<i>147</i>	Cambridge Int. Cnt. Of Shanghai Normal U	Shanghai	China
5	14	<i>146</i>	Gao Xin No. 1 HS	Xi'An	China

TOP FIVE OVERALL DIVISION 02 TEAM SCORES

<u>#</u>	<u>Reg</u>	<u>Score</u>	<u>School</u>	<u>City</u>	<u>State</u>
1	01	<i>145</i>	Stuyvesant HS	New York	NY
2	13	<i>144</i>	The Harker School	San Jose	CA
3	12	<i>139</i>	John Foster Dulles HS	Sugar Land	TX
4	01	<i>134*</i>	Canyon Crest Academy	San Diego	CA
5	13	<i>134</i>	Montgomery Blair HS	Silver Spring	MD

Note: The team tie-break (*) is that the tie goes to the school with the highest scoring student.

Note: These schools are recognized as “overall” winners for each Division and are removed from that Division’s regional winners’ pool.



AAPT PHYSICS BOWL 2013

PHYSICS EDUCATION

Highest Scoring *Division 01* Schools in each Region

<u>Reg</u>	<u>Score</u>	<u>School</u>	<u>City</u>	<u>State</u>
01	142	Montgomery Blair HS	Silver Spring	MD
02	138	Guilford HS	Guilford	CT
03	123	Ay Jackson Secondary School	Toronto	ON
04	127	North Allegheny Senior HS	Wexford	PA
05	126	William G. Enloe Magnet HS	Raleigh	NC
06	143	Northview HS	Duluth	GA
07	120	Hawken School	Gates Mills	OH
08	125	Carmel HS	Carmel	IN
09	143	Libertyville HS	Libertyville	IL
10	113	Minnetonka HS	Minnetonka	MN
11	130	Oak Ridge HS	Oak Ridge	TN
12	127	John Foster Dulles HS	Sugar Land	TX
13	137	Lynbrook HS	San Jose	CA
14	142	New Westminster Secondary School	New Westminster	BC

Second Highest Scoring *Division 01* Schools in each Region

<u>Reg</u>	<u>Score</u>	<u>School</u>	<u>City</u>	<u>State</u>
01	137	Stuyvesant HS	New York	NY
02	126	The Bromfield School	Harvard	MA
03	113*	Smithtown HS East	Nesconset	NY
04	126	West Windsor-Plainsboro HS S	West Windsor	NJ
05	117	Thomas S Wootton HS	Rockville	MD
06	132	Walton HS	Marietta	GA
07	106	Beavercreek HS	Beavercreek	OH
08	109	De La Salle Coll. HS	Warren	MI
09	125	Vernon Hills HS	Vernon Hills	IL
10	104	Edina Center for Acad. Excellence	Eden Prairie	MN
11	116	Montgomery Bell Academy	Nashville	TN
12	124	William P Clements HS	Sugar Land	TX
13	124	North Hollywood HS	North Hollywood	CA
14	119	Olympia HS	Olympia	WA

Highest Scoring *Division 01* Schools outside the top 2 of their Region

<u>Reg</u>	<u>Score</u>	<u>School</u>	<u>City</u>	<u>State</u>
01	131	Thomas Jefferson HS for Sci-Tech	Alexandria	VA
01	127*	Bergen County Academies	Hackensack	NJ

* = place determined by tiebreaker

Highest Scoring *Division 02* Schools in each Region

<u>Reg</u>	<u>Score</u>	<u>School</u>	<u>City</u>	<u>State</u>
01	132	High Technology HS	Lincroft	NJ
02	109	King and Low-Heywood Thomas Sch.	Stamford	CT
03	120	Univ of Toronto Schools	Toronto	ON
04	133	West Windsor-Plainsboro HS South	West Windsor	NJ
05	104	Raleigh Charter HS	Raleigh	NC
06	106	West Shore Jr/Sr HS	Melbourne	FL
07	110	Beavercreek HS	Beavercreek	OH
08	123	Carmel HS	Carmel	IN
09	122	Libertyville HS	Libertyville	IL
10	110	Arrowhead HS	Hartland	WI
11	100	Clayton HS	Clayton	MO
12	109	William P Clements HS	Sugar Land	TX
13	122	University HS-Irvine	Irvine	CA
14	119	WHBC of Wuhan Foreign Lang. Sch	Wuhan	China

Second Highest Scoring *Division 02* Schools in each Region

<u>Reg</u>	<u>Score</u>	<u>School</u>	<u>City</u>	<u>State</u>
01	115	Oklahoma School of Science/Math	Oklahoma City	OK
02	100	Hopkins School	New Haven	CT
03	119	Colonel by Secondary School	Gloucester	ON
04	119*	West Windsor – Plainsboro HS North	Plainsboro	NJ
05	99	Thomas S Wootton HS	Rockville	MD
06	104	Stanton College Prep School	Jacksonville	FL
07	97	New Albany HS	New Albany	OH
08	77	De La Salle Collegiate HS	Warren	MI
09	86	Vernon Hills HS	Vernon Hills	IL
10	89	Mayo HS	Rochester	MN
11	86	Oak Ridge HS	Oak Ridge	TN
12	108	Martin HS	Arlington	TX
13	101*	The Bishop's School	La Jolla	CA
14	116	Westview HS	Portland	OR

Highest Scoring *Division 02* Schools outside the top 2 of their Region

<u>Reg</u>	<u>Score</u>	<u>School</u>	<u>City</u>	<u>State</u>
04	119	Millburn HS	Hackensack	NJ
04	118	North Allegheny Senior HS	Wexford	PA

* = place determined by tiebreaker