Choose a Challenger

There is talk of having a Colchester Middle School school-wide triathlon featuring 1 competitor from each of the teams in the school. The 3 events will be discus throw, long jump and a 220 yard dash. There must be 1 representative from each team performing in all 3 events. Looking at the results of your recent PE test scores, decide which member of the Challenger Team should be chosen to represent our team in this triathlon.

Copyright ©, 2003. Exemplars. All rights reserved.

Grade Levels 6 - 8

Choose a Challenger

There is talk of having a Colchester Middle School school-wide triathlon featuring 1 competitor from each of the teams in the school. The 3 events will be discus throw, long jump and a 220 yard dash. There must be 1 representative from each team performing in all 3 events. Looking at the results of your recent PE test scores, decide which member of the Challenger Team should be chosen to represent our team in this triathlon.

Context

This task was given during the last week of school to all members of our multi-age, six-seven team. The students were in the midst of our interdisciplinary Olympics Unit, which included studying the history of the Olympic games, as well as preparing to enjoy the 1996 Summer Games. The physical education classes had just completed their track and field testing. This was a big topic of conversation and an inspiration for this task.

What This Task Accomplishes

The students had to organize and analyze the data and make mathematical decisions that involved comparing results measured in time and in distance. There is good opportunity for mathematical representations in the solution of this task.

What the Student Will Do

Students were given the results of three track and field events for 15 team members. They were asked to compare these results and select the best candidate to compete in a triathlon featuring these three events. Most students made some form of graphical representation of the data for comparison purposes. Others assigned a point system to the leaders in each field and compared point totals to determine a winner.

Interdisciplinary Links

Check with your physical educator. Your students probably do some activities that would give you similar results that you could use, or you could conduct a set of events to generate your own data. If there had been another week of school, we would have actually had the school-wide event described. To reduce the anxiety around physical competition between students, you could hold mock Olympic events such as "The cotton ball throw" which might be less threatening to students who are not as athletically inclined.

Teaching Tips

Get your physical educator to help you generate the data set needed for this task. I suggest

Copyright ©, 2003. Exemplars. All rights reserved.

having a variety of events as opposed to having all events based on speed, strength or jump length, as it makes more interesting comparisons if the units of measure are varied.

I adapted this task for special education students by having them work with a subset of only five competitors.

I believe that the brevity of all student responses may be a result of assigning this task during the final week of the school year. They did seem very engaged in finding solutions. There might have been more interesting examples of student work if one student's event results had not been as outstanding as Adam's.

Suggested Materials

- Stopwatches (for gathering data)
- Tapes (for gathering data)
- Calculators
- Graph paper

Time Required

50 minutes

Some students used extra time at home or in the computer room to create graphs or word process their responses.

Possible Solutions

See Expert solution

Benchmark Descriptors

Novice
This student added the times and distances for the top placeholders to get the "highest" score. This is not a workable approach. S/he made a poor attempt at a graph, which is inappropriate to the task and poorly constructed. There is no mathematical language used in his/her solution.

Apprentice
This student used no mathematics in coming to his/her solution. S/he says s/he made a chart, but in fact only made a few x's on the given list of results. There is no math language used in the student's solution. While s/he seems to have understood the task, s/he did not put much energy into finding a solution.

Practitioner
Rearranging the results in a chart as this student did is a workable approach to solving this problem. This is a good example of a solution that did not require a lengthy narrative for the

Copyright ©, 2003. Exemplars. All rights reserved.

reader to understand what was done to solve the problem. The student makes an interesting observation about the median score in each event. This shows that this student has a concrete understanding of how to find the median, but lacks conceptual understanding of its appropriate use. It is unclear why s/he did not mention David as an alternate candidate based on David's scores.

Expert
This student had an interesting approach to solving the problem by assigning points for the best scores in each event and comparing the competitors based on these totals. S/he used a computer spreadsheet to create an interesting stacked bar graph. The original was easier to read as it was in color. It is apparent that this student understood the task and was able to solve it efficiently.

Copyright ©, 2003. Exemplars. All rights reserved.

Novice

I was asked to Choose a Challenger= Porige, adam s, Sean, David Adam B, Aadam C, Ryan E, Jenn, Kevin, Carol, Natasha, matt, SuSan, Jason, Julie, Ryan. A, by tie Scores they got on the Long Jump, Discus 220 yard dash.

On the Page with all the results I marked Each score by high, low, avarage. The two top Scores were Adam Bengerman, Adam Clevelle.

To See wich one was the highest I added All three scores in the three competitions.

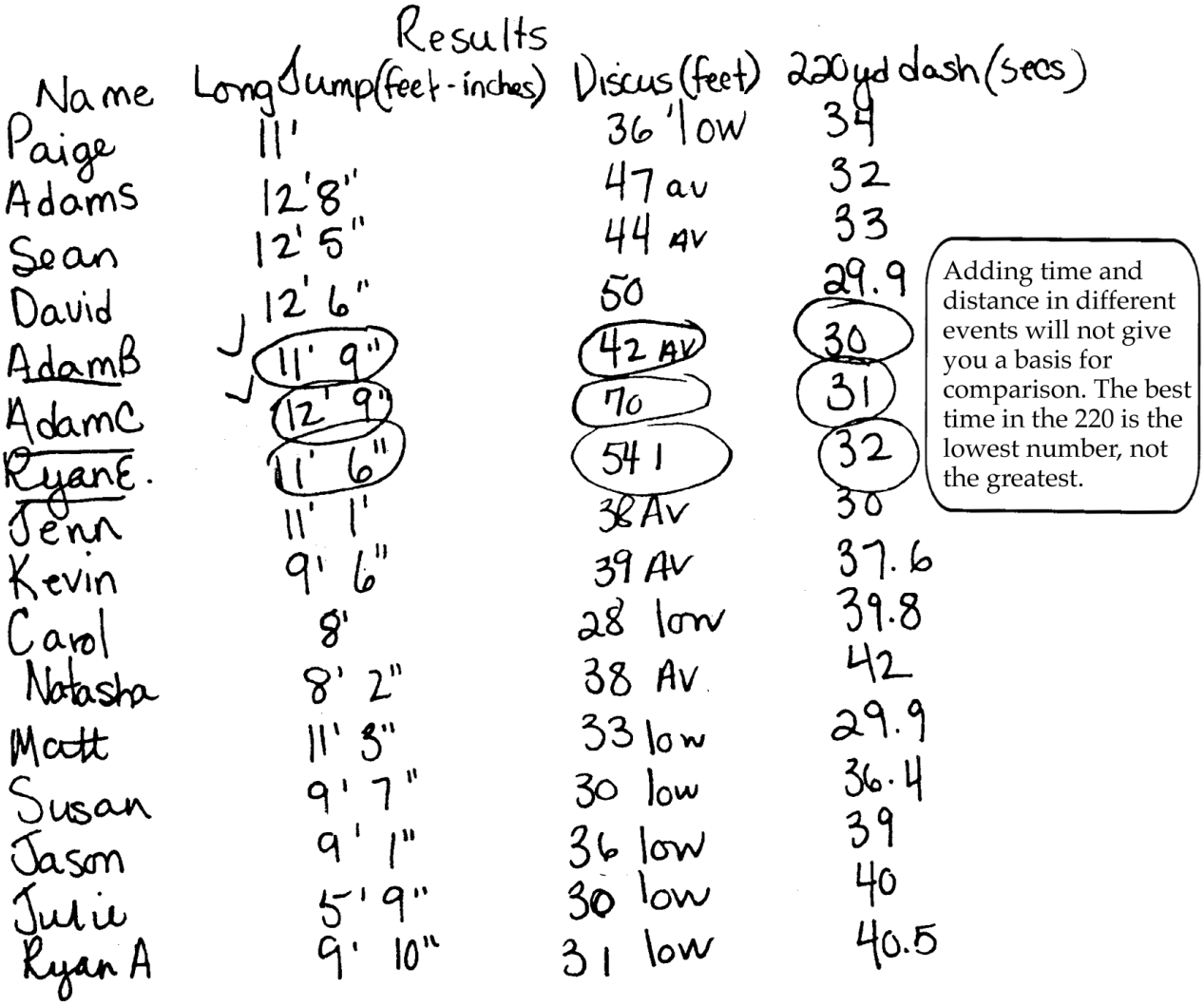
Adam Benjerman Scored a 83, Adam Clavelle Scaret a 113, Ryan Esberg Scored a 97.

looking at these Scores adam clavelle Score thre high of 113. meaning he won.

So I Choose Adam clavelle.

Copyright ©, 2003. Exemplars. All rights reserved.

Novice



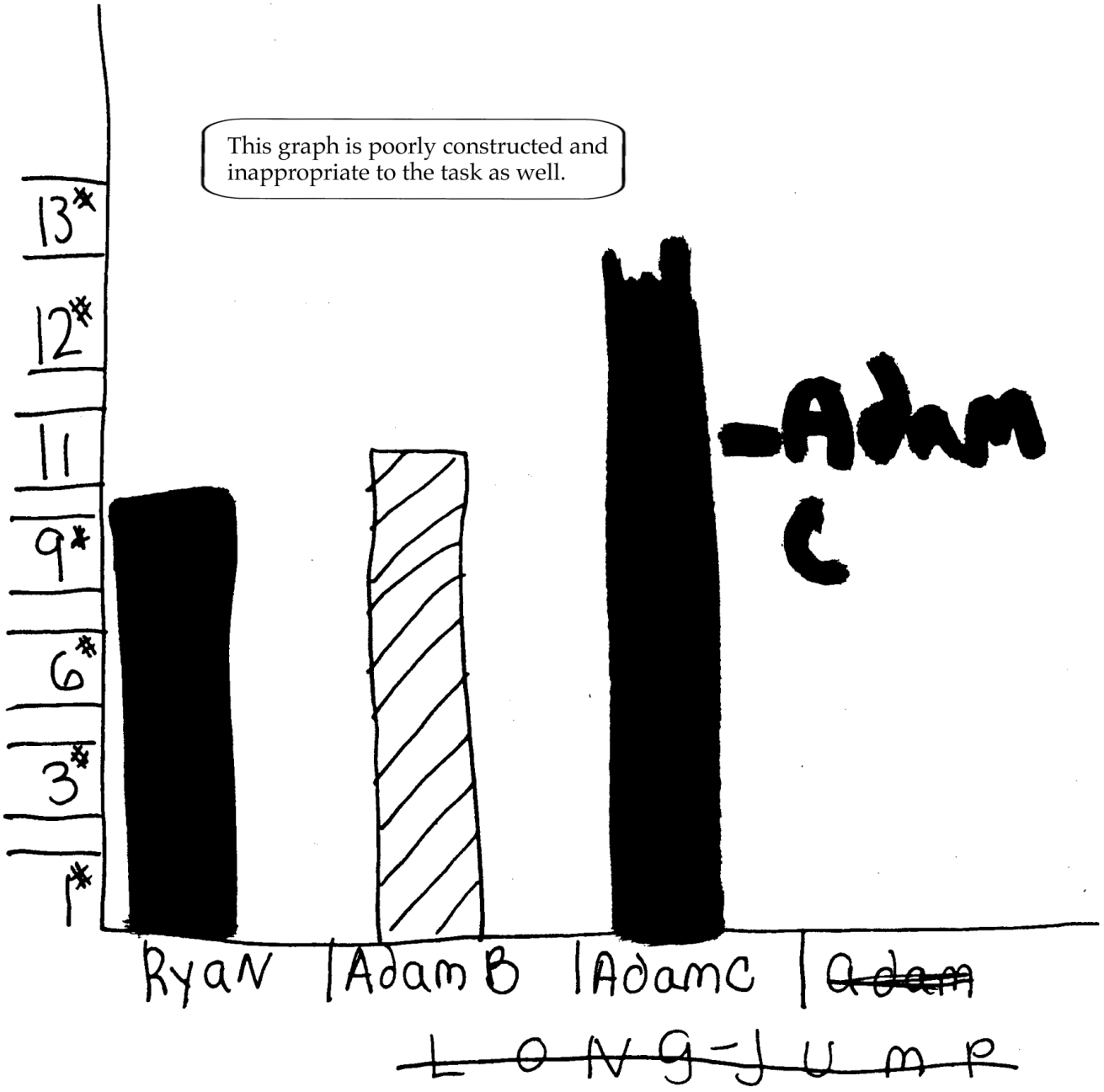
Results

Name	Long Jump (feet-inches)	Discus (feet)	220 yd dash (secs)
Paige	11'	36 low	34
Adams	12' 8"	47 av	32
Sean	12' 5"	44 AV	33
David	12' 6"	50	29.9
AdamB	11' 9"	42 AV	30
AdamC	12' 9"	70	31
RyanE.	11' 6"	54 1	32
Jenn	11' 1'	38 Av	30
Kevin	9' 6"	39 AV	37.6
Carol	8'	28 low	39.8
Natasha	8' 2"	38 AV	42
Matt	11' 3"	33 low	29.9
Susan	9' 7"	30 low	36.4
Jason	9' 1"	36 low	39
Julie	5' 9"	30 low	40
Ryan A	9' 10"	31 low	40.5

Adding time and distance in different events will not give you a basis for comparison. The best time in the 220 is the lowest number, not the greatest.

Copyright ©, 2003. Exemplars. All rights reserved.

Novice



Copyright ©, 2003. Exemplars. All rights reserved.

Apprentice

I am asked to figure out who on the Challenger team should represent us all in the school wide triathalon.

We made a chart of the results for whodid the events which is shown on the next page.

The chart on the nextpage is how I determined my answer. I looked first at the long jump to see who jumped the fearthest. I picked 3 people withthe top scores and picked who had the best overall including the other two events and the person that I think should represent our team is Adam C. because he had the best scores in the long jump and the discus throw. In the 220 yd dash Adam got 31sec. and that wasnt the best time but the only ones better was Matt and David at 29.9 sec. and me and Adam Benjamin at 30. Seconds He came very close though. and with

S/He did not make a chart, but only put x's on the given page of results.

Copyright ©, 2003. Exemplars. All rights reserved.

Apprentice

Results

Name	Long Jump (feet-inches)	Discus (feet)	220yd dash (secs
Paige	11'	36'	34
Adam	12'8" X	47 X	32
Sean	12' 5"	44	33
David	12' 6" X	50 X	29.9
AdamB	11' 9"	42	30
AdamC	12' 9" X	70X	31X
RyanE.	11' 6"	54	32
Jenn	11' 1'	38	30
Kevin	9' 6"	39	37.6
Zand	8'	28	39.8
Natasha	8' 2"	38	42
Matt	11' 3"	33	29.9
Susan	9' 7"	30	36.4
Jason	9' 1"	36	39
Julie	5' 9"	30	40
Ryan A	9' 10"	31	40.5

Copyright ©, 2003. Exemplars. All rights reserved.

Practitioner

The event described in the task is a triathlon not a marathon. This does not affect the solution, but is a point of clarification.

In this problem I was asked to figure out who would be the most eligible athlete to be in a marathon. This person would have to be from our team and would have to be very good. Keep in mind that the sixteen people that were used wouldn't be the whole team. What I did was I made a chart that went from best to last in each event.

Look on bottom of page.

By doing this it would show who was the best athlete out of these three events which by the way were the long jump, the discus, and the 220 yard dash. After this I looked at my chart and said that the best person from the sixteen that were picked would be Adam Clavelle because he was placed 1st in two events and 5th in the other event. If I had to pick the person according to median that person would be Paige Welch.

CHALLENGER CHOICE

NAME GR-LE	LONG JUMP	NAME	DISCUS GR-LE	NAME	22O YARD DASH
Adam	12′ 9″	Adam	70′	David	29.9 sec.
Adam	12′ 8″	Ryan	54′	Matt	29.9 sec.
David	12′ 6″	David	50′	Adam	30.0 sec.
Sean	12′ 5″	Adam	47′	Jenn	30.0 sec.
Adam	11′ 9″	Sean	44′	Adam	31.0 sec.
Ryan	11′ 6″	Adam	42′	Ryan	32.0 sec.
Matt	11′ 3″	Kevin	39′	Adam	32.0 sec.
Jenn	11′ 1″	Jenn	38′	Sean	33.0 sec.
Paige	11′ 0″	Natasha	38′	Paige	34.0 sec.
Ryan	9′ 10″	Paige	36′	Susan	36.4 sec.
Susan	9′ 7″	Jason	36′	Kevin	37.6 sec.
Kevin	9′ 6″	Matt	33′	Jason	39.0 sec.
Jason	9′ 1″	Ryan	31′	Carol	39.8 sec.
Natasha	8′ 2″	Susan	30′	Julie	40.0 sec.
Carol	8′ 0″	Julie	30′	Ryan	40.5 sec.
Julie	5′ 9″	Carol	28′	Natasha	42.0 sec.
Median	11′ 5″	Average	40′	Average	32.8 sec.
		Median	37′	Median	35 sec.

Copyright ©, 2003. Exemplars. All rights reserved.

Expert

To solve this problem and figure out the best score I devised a way to easily match them up. First I gave each person a letter so the names would fit on the graph. I then went through the sheet (attached page) and numbered the scores from one to fifteen. I did this because it is easier to add and compare 7, 12, and 1 then it is 11' 3", 33, and 29.9. I then made a chart that stacked the scores, so, the better the score the smaller the overall bar. I found the the choose a Challenger should be Adam Cl., for he got the best in two events and fifth in the other.

This is a list of the names and their letters:

Paige	A
Adam S.	B
Sean	C
David	D
Adam B.	E
Adam Cl.	F
Ryan E.	G
Jenn	H
Kevin Lo.	I
Carol*	J
Natasha*	K
Matt	L
Susan*	M
Jason	N
Julie*	O
Ryan A.	P

*Aliases

Some team members were willing to have their results used, but did not want me to use their real names. I gave everyone the option of using an alias.

Copyright ©, 2003. Exemplars. All rights reserved.

Expert

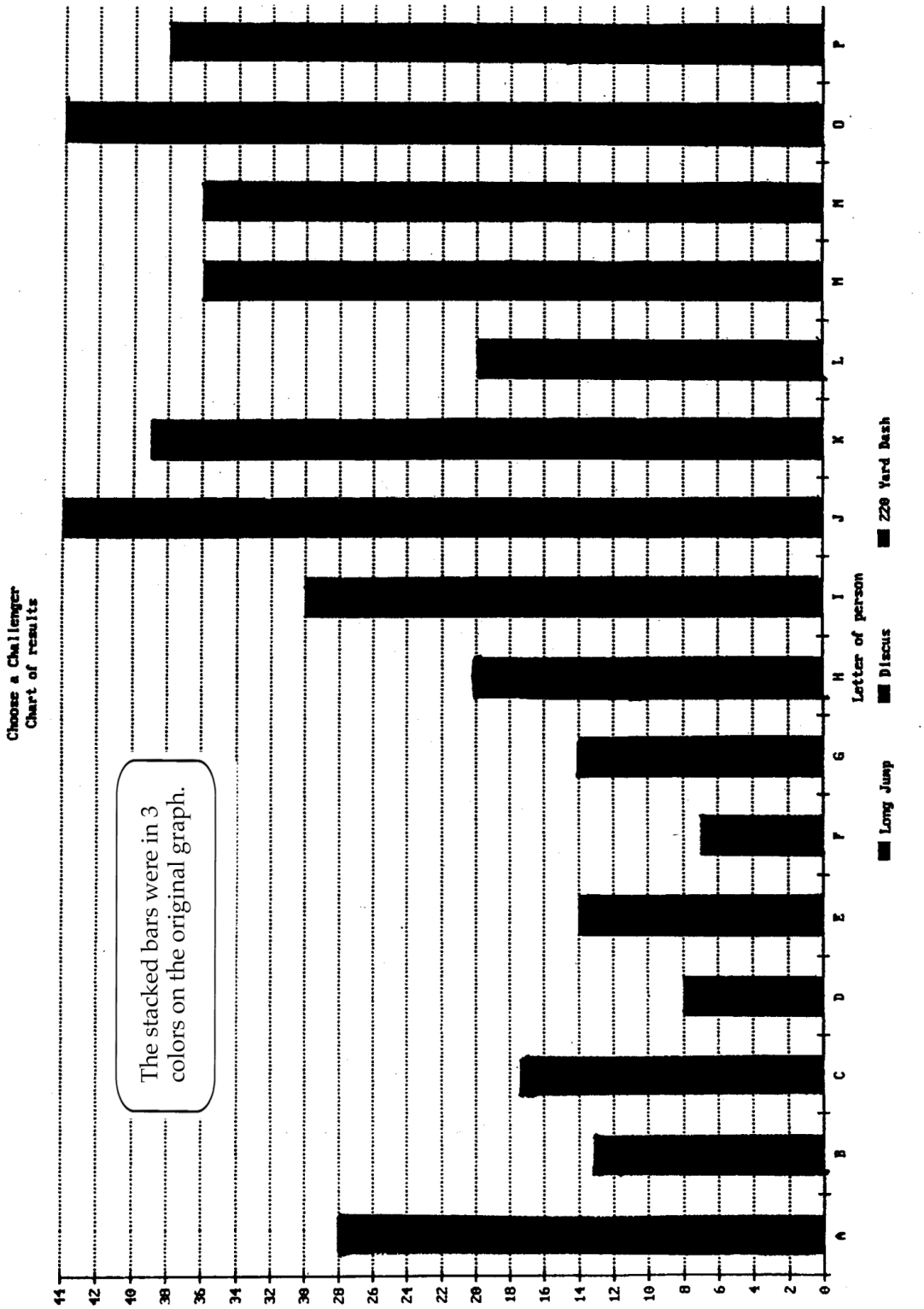
Results

Name		Long Jump (feet inches)		Discus (feet)		220yd dash (secs.)	
Paige	6	11'	9	36'	10	34	9
AdamS	6	12' 8"	2	47	4	32	7
Sean	6	12' 5"	4	44	5	33	8
David	6	12' 6"	3	50	3	29.7	2
AdamB	7	11' 9"	5	42	6	30	3
AdamC	7	12' 9"	1	70	1	31	5
RyanE	7	11' 6"	6	54	2	32	6
Jenn	7	11' 1'	8	38	8	36	4
Kevin	6	9' 6"	12	39	7	37.6	11
Carol	7	8'	15	28	16	39.8	13
Natasha	7	8' 2"	14	38	9	42	16
Matt	7	11' 3"	7	33	12	29.9	1
Susan	7	9' 7"	11	30	15	36.4	10
Jason	7	9' 1"	13	36	11	39	12
Julie	6	5' 9"	16	30	14	40	14
RyanA	6	9' 10"	10	31	13	40.5	15

All students received this list of students and results of the 3 events.

Copyright ©, 2003. Exemplars. All rights reserved.

Expert



Choose a Challenger

Copyright ©, 2003. Exemplars. All rights reserved.