

Want to be good at science? Take lots of math

WASHINGTON (AP) -- Students who had more math courses in high school did better in all types of science once they got to college, researchers say.

On the other hand, while high school courses in biology, chemistry or physics improved college performance in each of the individual sciences, taking a high school course in one science didn't result in better college performance in the others.

Philip M. Sadler of the Harvard-Smithsonian Center for Astrophysics and Robert H. Tai of the University of Virginia surveyed 8,474 students taking introductory science courses at 63 U.S. colleges and universities. Their findings are reported in Friday's edition of the journal *Science*.

Science educators debate the effect of the order in which students take science courses. Since the 1890s biology has tended to come first, followed by chemistry and then physics.

Some educators argue that physics should be taught earlier because it will help students understand the other two science areas; others say having chemistry first will help in learning biology.

But in this study neither was the case.

Using a scale of 0-to-100 points, Sadler and Tai found that every year of high school math a student took added 1.86 points to their grade in college chemistry. Taking chemistry in high school added 1.72 points to the college grade, but taking biology or physics in high school had no significant impact on the college chemistry grade.

Likewise, students taking college biology got a 1.84 point boost for each year of high school math. Taking high school biology got them an extra 1.35 points, but high school chemistry and physics had no significant effect.

And for physics, each year of high school math added 1.28 points, high school physics gave a 1.32 point boost, while high school biology and chemistry had no impact.

"I was surprised," Sadler said in a telephone interview. "I had a very open mind about whether this kind of early preparation would pay off."

"The most important thing for high school science teachers is to make sure there is lots of math in whatever science course they teach," Sadler said. "Math is so important in college science."

The paper does note that other variables not measured in their study may also have an impact, such as a student's interest in a particular subject and their parents' occupations.

Gerry Wheeler, executive director of the National Science Teachers Association, welcomed the paper as a source of new data for making decisions on science teaching.

"The correlation with math makes sense," he said.

But Wheeler, who was not part of the research group, cautioned that a correlation isn't necessarily the same as cause and effect.

The research was supported by the National Science Foundation.