How much math, science homework is too much?

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When it comes to adolescents with math and science homework, more isn't necessarily better—an hour a day is optimal—but doing it alone and regularly produces the biggest knowledge gain, according to research published by the American Psychological Association.

Researchers from the University of Oviedo in Spain looked at the

performance of 7,725 public, state-subsidized and private school students in the principality of Asturias in northern Spain. The students had a mean age of 13.78. Girls made up 47.2 percent of the sample. The article was published in APA's *Journal of Educational Psychology*.

The students were given questionnaires asking how often they did homework and how much time they spent on various subjects. They were also asked whether they did their homework alone or whether they had help and, if so, how often. Their academic performance in math and science was measured using a standardized test. Adjustments were made to account for gender and socioeconomic background. Prior knowledge was measured using previous grades in math and science.

The researchers found that the students spent on average between one and two hours a day doing homework in all subjects. Students whose teacher systematically assigned homework scored nearly 50 points higher on the standardized test. Students who did their math homework on their own scored 54 points higher than those who asked for frequent or constant help. The curves were similar in science.

"Our data indicate that it is not necessary to assign huge quantities of homework, but it is important that assignment is systematic and regular, with the aim of instilling work habits and promoting autonomous, self-regulated learning," said Javier Suarez-Alvarez, PhD, co-lead author with Ruben Fernandez-Alonso, PhD. "The data suggest that spending 60 minutes a day doing homework is a reasonable and effective time."

The total amount of homework assigned by teachers was a little more than 70 minutes per day on average, the researchers found. While some teachers assigned 90-100 minutes of homework per day, the researchers found that the students' math and science results began to decline at that point. And while they found a small gain in results between 70 and 90 minutes, "that small gain requires two hours more homework per week,

which is a large time investment for such small gains," said Suarez-Alvarez. "For that reason, assigning more than 70 minutes of homework per day does not seem very efficient."

As for working autonomously or with help, the researchers found that students who needed help and did 70 minutes of homework per day could expect to score in the 50th percentile on their test while autonomous students spending the same amount of homework time could expect to score in the 70th percentile. One possible explanation of this result is that self-regulated learning is strongly connected to academic performance and success, according to Suarez-Alvarez.

"The conclusion is that when it comes to homework, how is more important than how much," said Suarez-Alvarez. "Once individual effort and autonomous working is considered, the time spent becomes irrelevant."

More information: "Adolescents' Homework Performance in Mathematics and Science: Personal Factors and Teaching Practices," by Ruben Fernandez-Alonso and Javier Suarez-Alvarez, University of Oviedo, and Jose Muniz, University of Oviedo and Biomedical Research Network in Mental Health, Barcelona, Spain; *Journal of Educational Psychology*; online March 16, 2015. www.apa.org/pubs/journals/releases/edu-0000032.pdf

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