

RAYTHEON U.S. MIDDLE SCHOOL STUDENTS MATH HABITS STUDY

With growing concerns over the country's global competitiveness, technical proficiency and talent pool to fuel future innovations, Raytheon commissioned a survey to uncover the attitudes and behaviors of today's U.S. middle school students toward math. This study seeks to understand what young students between the ages of 10 and 15 think about math. The study focused on the time and attention students give to math and their general understanding of math's role in their daily lives, as well as their futures. Furthermore, Raytheon intended key findings from the survey to assist corporations, educators and volunteers in understanding how youth math programs should evolve to address today's young students' achievements in the subject of math.

Conducted in August 2009 by independent panel research firm, Toluna, the survey is based on 1,076 U.S. middle school students ages 10-15 who completed grade six, seven or eight in spring/summer 2009. It bears a confidence interval of +/- 2.99% for the total sample at the 95% confidence level. For more information, visit www.Raytheon.com.

Executive Summary

The "Raytheon U.S. Middle School Students Math Habits Study" found that students spend an alarmingly large amount of time in front of a screen doing one or more of the following activities: watching TV, playing video games, sending text messages or using the computer (for non-school related tasks). In fact, seventy-two percent of U.S. middle school students spend more than three hours each day outside of school in front of a TV, mobile phone or computer screen rather than doing homework or other academic-related activities. By contrast, just 10 percent of students spend the same amount of time on their homework each day, and 67 percent spend less than one hour on their math homework.

The study findings also uncovered a shift in attitudes from sixth grade to eighth grade. As students progress from their last year of elementary school into middle school, there is a dramatic increase in those who "hate" math. Moreover, 39 percent of the survey respondents cited math as unimportant for their future careers whereas only 28 percent of students could name an actual career that uses math. Students fail to understand the connection between math and potential careers. The problem is especially dire for girls, who are overwhelmingly attracted to careers that don't use math skills. Girls expressed the most interest in careers as singers/musicians (23 percent) and actresses (22 percent) over careers requiring math skills. Boys were more attracted to careers that actively use math skills, but still had non-math-related careers high on the list. Top selections included video game creators (33 percent) and professional athletes 26 percent).

Attitudes Toward Math

- Approximately one in 10 sixth graders report "hating" math, but this number jumps to one to five in eighth grade.
- Sixty-one percent of respondents would rather take out the trash than do math homework; 70 percent would rather read a book and 54 percent would rather practice a musical instrument.
- While 78 percent of respondents reported getting As and Bs in math, this perception did not carry through to performance on a basic math quiz given during the survey, which included the question,

“How many sides does an equilateral triangle have?” (answer: three). Less than 50 percent received a grade of an A or B while 31 percent got a D or an F.

Screen Time vs. Math Time

- Seventy-two percent of U.S. middle school students spend more than three hours each day outside of school in front of a TV, mobile phone or computer screen rather than doing homework or other academic-related activities.
- By contrast, just 10 percent of students spend the same amount of time on their homework each day, with 67 percent spending less than one hour on their math homework.

Career Path & Interests

- When asked to name their “dream job,” girls were attracted to careers as singers/musicians (23 percent) and actresses (22 percent) over careers requiring math skills, such as doctors (13 percent), teachers (10 percent) and video game creators (seven percent).
- Boys were more attracted to careers that actively use math skills, but still had non-math-related careers high on the list. Top selections included: video game creators (33 percent), professional athletes (26 percent), computer/Internet programmers (13 percent) and singers/musicians (11 percent).
- Thirty-nine percent of students say math is the most important subject for their future careers, yet 28 percent of students could not name an interesting career that uses math.

Full Survey Results

1. Which of these statements best describes how you feel about math?

- I hate math – 17%
- I love math – 18%
- I like math – 35%
- I don't really love or hate math - it is just something I have to do – 30%

2. What grades do you get most often in math?

- Mostly A's – 36%
- Mostly B's – 41%
- Mostly C's – 18%
- Mostly D's – 4%
- Mostly F's – 1%

3. Which activity would you rather do in each of these instances?

Take out the trash or do math homework:

- Take out the trash – 61%
- Math homework – 39%

Read a book or do math homework:

- Read a book – 70%
- Math homework – 30%

Practice an instrument or do math homework:

- Practice an instrument – 54%
- Math homework – 46%

Get a shot at the doctor's office or do math homework:

- Get a shot at the doctor's office – 20%
- Math homework – 80%

Do English homework or math homework:

- English homework – 46%
- Math homework – 54%

4. During the school year, how much time do you spend on the following activities on an average weekday during non-school hours?

Playing Sports:

- 0 hours – 27%
- 0-1 hours – 31%
- 1-2 hours – 24%
- 2-3 hours – 11%
- 3+ hours – 7%

Watching TV:

- 0 hours – 3%
- 0-1 hours – 20%
- 1-2 hours – 38%
- 2-3 hours – 21%
- 3+ hours – 19%

Playing Video Games:

- 0 hours – 18%
- 0-1 hours – 39%
- 1-2 hours – 25%
- 2-3 hours – 9%
- 3+ hours – 10%

Texting:

- 0 hours – 43%
- 0-1 hours – 28%
- 1-2 hours – 13%
- 2-3 hours – 7%
- 3+ hours – 8%

Talking on the phone:

- 0 hours – 25%
- 0-1 hours – 53%
- 1-2 hours – 13%
- 2-3 hours – 5%
- 3+ hours – 5%

On the computer/Internet (for activities unrelated to school):

- 0 hours – 6%
- 0-1 hours – 39%
- 1-2 hours – 32%
- 2-3 hours – 11%
- 3+ hours – 12%

Doing homework for all subjects other than math:

- 0 hours – 3%
- 0-1 hours – 44%
- 1-2 hours – 38%
- 2-3 hours – 9%
- 3+ hours – 7%

Doing homework for math:

- 0 hours – 4%
- 0-1 hours – 67%
- 1-2 hours – 22%
- 2-3 hours – 5%

- 3+ hours – 3%

5. Rank the below subjects with 1 being the subject you like the most and 5 being the subject you'd want to skip the most.

English:

- Rank 1 – 15%
- Rank 2 – 17%
- Rank 3 – 20%
- Rank 4 – 24%
- Rank 5 – 24%

History:

- Rank 1 – 11%
- Rank 2 – 21%
- Rank 3 – 24%
- Rank 4 – 25%
- Rank 5 – 19%

Math:

- Rank 1 – 19%
- Rank 2 – 20%
- Rank 3 – 16%
- Rank 4 – 17%
- Rank 5 – 28%

Science:

- Rank 1 – 21%
- Rank 2 – 27%
- Rank 3 – 26%
- Rank 4 – 17%
- Rank 5 – 9%

Gym Class:

- Rank 1 – 34%
- Rank 2 – 15%
- Rank 3 – 14%
- Rank 4 – 16%
- Rank 5 – 20%

6. In school, what's most important to you?

- Getting good grades – 62%
- Being popular – 15%
- Preparing for college – 14%
- Excelling in sports – 10%

7. Can your parents help you with your math homework?

- Yes, they can help me – 69%
- No, they don't know how to do the homework either – 14%
- I don't ask them for help – 16%
- I don't know – 2%

8. Who do you think gets better grades in math?

- Girls – 26%
- Boys – 17%
- Neither - both girls and boys get about the same grades – 57%

9. Do you think you will enter into a career that requires math skills?

- Yes – 53%
- No – 47%

10. Which of these careers would be your 'dream' job?

- Video game creator – 19%
- Singer/Musician – 17%
- Professional athlete – 16%
- Actor/Actress – 14%
- Fashion designer – 10%
- Doctor – 10%
- Computer/Internet programmer – 9%
- Teacher – 6%
- Amusement park ride designer – 5%
- Astronaut – 4%
- Pilot – 4%
- Other – 28%

11. What do you think is the most important subject that you'll use from school in your future career?

- Math – 39%
- English – 31%
- Science – 21%
- Gym class – 7%
- History – 3%

12. Which of these activities would get you most excited about math (outside of school)?

- Learning how to build a robot – 33%
- Playing interactive math-related games online – 25%
- Listening to someone with a cool job talk about how they use math – 22%
- Hearing from a celebrity who likes math – 7%
- Competing in math competitions – 6%
- Other – 5%

13. Name one interesting career that uses math.

- Can't name one – 28%

- Open ended answers – 72%

14. What motivates you the most to do well in math?

- I want to get good grades – 41%
- I'll need math skills in the future - for college or for a job – 30%
- I don't want to disappoint my parents – 15%
- I'll get into trouble if I fail – 13%
- I don't want to disappoint my teachers – 1%

15. If the average text message takes 5 seconds to compose and you send exactly 180 texts every day, how much time in minutes do you spend in a 30-day?

- 450 [CORRECT] – 43%
- 900 – 18%
- 5400 – 11%
- 27000 – 28%

16. If a train stops for 5 minutes at each stop and stops 13 times during each trip, how much time in seconds does the train stop each day?

- 65 – 19%
- 780 – 6%
- 3500 – 6%
- 3900 [CORRECT] – 70%

17. Harry Potter's Nimbus 2000 flies at 60 miles per hour. How many miles can he fly in 5 hours?

- 12 – 3%
- 60 – 2%
- 300 [CORRECT] – 94%
- 2000 – 2%

18. A storm is moving at 30 miles per hour. The next town is 75 miles away. The current time is 10:00 p.m. At what time will the storm arrive?

- Midnight – 7%
- 12:30 a.m. [CORRECT] – 84%
- 1:00 a.m. – 6%
- 1:30 a.m. – 4%

19. $A + B = C$. If A is 6 and C is 13, what is B?

- 7 [CORRECT] – 94%
- 19 – 5%
- 20 – 1%
- 78 – 0%

20. What kind of angle is 180 degrees?

- A right angle – 25%
- A circle – 9%
- A straight line [CORRECT] – 56%

- The angle of a triangle – 11%

21. How many sides does an equilateral triangle have?

- 3 [CORRECT] – 82%
- 4 – 10%
- 5 – 5%
- 6 – 4%

###