

The Mathematics Attitudes and Perceptions Survey

The Mathematics Attitudes and Perceptions Survey (MAPS) instrument [1] consists of the following 31 statements and 1 filter statement. The survey can be offered online or in written form. Students respond to each question using a 5-point Likert format: “Strongly Disagree”, “Disagree”, “Neutral”, “Agree”, and “Strongly Agree”. The student receives 1 point for a question if their answer is in the same direction—that is, in the disagree or agree direction—as the expert consensus, given at the end of each question below. If the student responds in the opposite direction of the expert consensus, or a neutral response is given, they receive 0 for that question. The total expertise index is calculated by averaging the scores for all questions except 19, 22, and 31. Subscale scores are calculated analogously, with the question numbers comprising each category given in the following table.

MAPS categories and corresponding question numbers

Category	Question
Growth Mindset	5, 6, 22, 31
Real World	13, 15, 21
Confidence	1, 14, 17, 20
Interest	12, 26, 32
Persistence	8, 10, 24, 29
Sense Making	3, 4, 11, 18, 23
Answers	2, 7, 9, 16, 28, 30
No category but scored for expertise	25, 27
Filter statement	19
Expertise (expert consensus)	all except 19, 22 and 31

The following questions are the MAPS instrument. The direction of the expert consensus follows each question in parentheses. A standard preamble for the survey would look something like:

“This is a survey of your attitudes and perceptions about math; these statements all have the response choices Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree, and should take less than 10 minutes. Please choose the response that matches *your* opinion, not what you think an instructor might say or want to hear.”

1. After I study a topic in math and feel that I understand it, I have difficulty solving problems on the same topic. (*Disagree*)
2. There is usually only one correct approach to solving a math problem. (*Disagree*)
3. I'm satisfied if I can do the exercises for a math topic, even if I don't understand how everything works. (*Disagree*)
4. I do not expect formulas to help my understanding of mathematical ideas, they are just for doing calculations. (*Disagree*)
5. Math ability is something about a person that cannot be changed very much. (*Disagree*)
6. Nearly everyone is capable of understanding math if they work at it. (*Agree*)
7. Understanding math means being able to recall something you've read or been shown. (*Disagree*)
8. If I am stuck on a math problem for more than ten minutes, I give up or get help from someone else. (*Disagree*)
9. I expect the answers to math problems to be numbers. (*Disagree*)
10. If I don't remember a particular formula needed to solve a problem on a math exam, there's nothing much I can do to come up with it. (*Disagree*)

11. In math, it is important for me to make sense out of formulas and procedures before I use them.
(*Agree*)
12. I enjoy solving math problems. (*Agree*)
13. Learning math changes my ideas about how the world works. (*Agree*)
14. I often have difficulty organizing my thoughts during a math test. (*Disagree*)
15. Reasoning skills used to understand math can be helpful to me in my everyday life. (*Agree*)
16. To learn math, the best approach for me is to memorize solutions to sample problems. (*Disagree*)
17. No matter how much I prepare, I am still not confident when taking math tests. (*Disagree*)
18. It is a waste of time to understand where math formulas come from. (*Disagree*)
19. We use this statement to discard the survey of people who are not reading the questions. Please select Agree (not Strongly Agree) for this question. (*Filter statement; discard data for respondents that do not choose Agree here.*)
20. I can usually figure out a way to solve math problems. (*Agree*)
21. School mathematics has little to do with what I experience in the real world. (*Disagree*)
22. Being good at math requires natural (i.e. innate, inborn) intelligence in math. (*Disagree*)
23. When I am solving a math problem, if I can see a formula that applies then I don't worry about the underlying concepts. (*Disagree*)
24. If I get stuck on a math problem, there is no chance that I will figure it out on my own.
(*Disagree*)
25. When learning something new in math, I relate it to what I already know rather than just memorizing it the way it is presented. (*Agree*)
26. I avoid solving math problems when possible. (*Disagree*)

27. I think it is unfair to expect me to solve a math problem that is not similar to any example given in class or the textbook, even if the topic has been covered in the course. (*Disagree*)
28. All I need to solve a math problem is to have the necessary formulas. (*Disagree*)
29. I get upset easily when I am stuck on a math problem. (*Disagree*)
30. Showing intermediate steps for a math problem is not important as long as I can find the correct answer. (*Disagree*)
31. For each person, there are math concepts that they would never be able to understand, even if they tried. (*Disagree*)
32. I only learn math when it is required. (*Disagree*)

[1] Code, W., Merchant, S., Maciejewski, W., Thomas, M., & Lo, J. (2016). *The Mathematics Attitudes and Perceptions Survey: an instrument to assess expert-like views and dispositions among undergraduate mathematics students*. International Journal of Mathematical Education in Science and Technology (IJMEST), available online, 21 pages. <http://dx.doi.org/10.1080/0020739X.2015.1133854>