

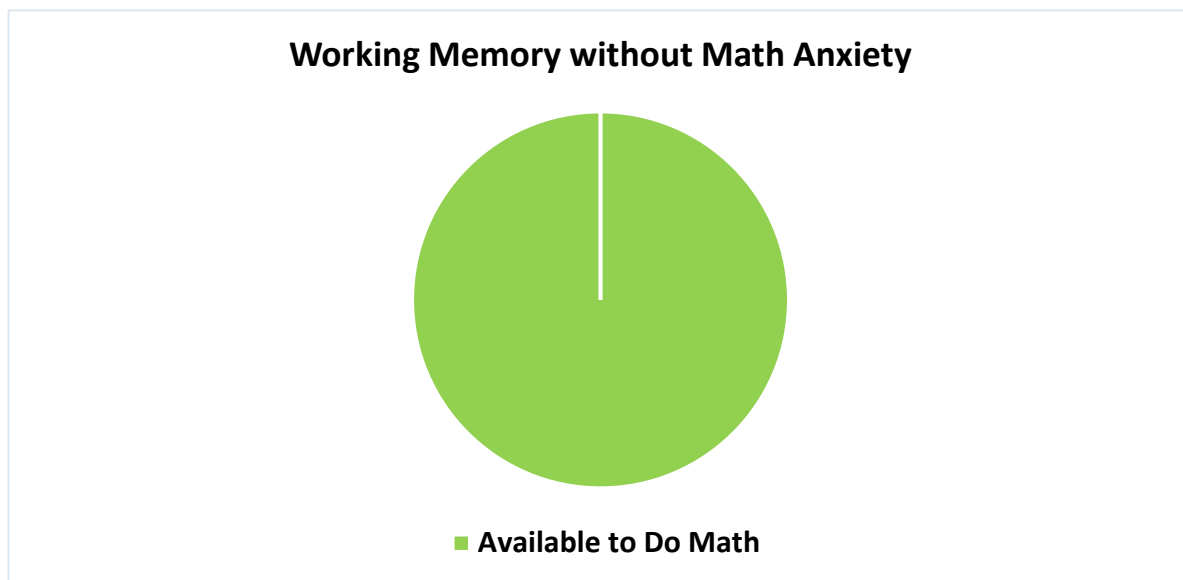
What Is Math Anxiety and What Can I Do about It as a Student?

What Is Math Anxiety?

Math anxiety is the negative emotions a person has when required to do math. Someone with math anxiety might have those feelings just thinking about doing math. Not everyone has math anxiety, but many people do.

Math Anxiety is not the inability to do math!

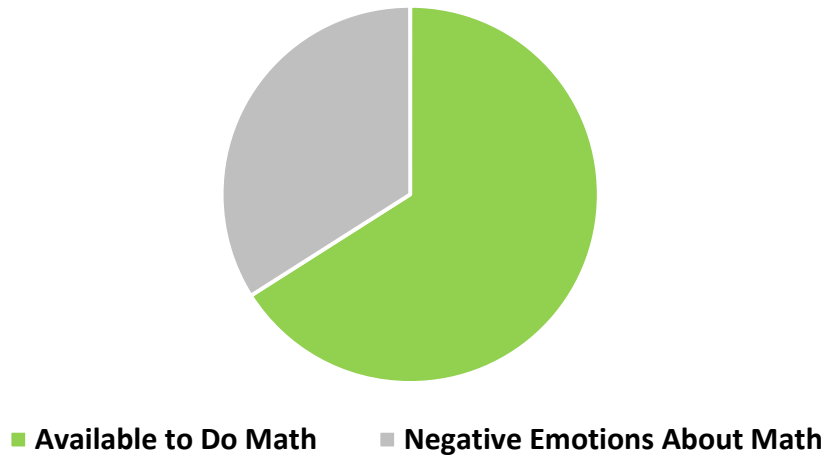
There is increasing evidence that math anxiety uses up some of a person's working memory. Working memory is the brainpower you use when solving a problem or learning something new. A person without math anxiety can use almost all of her working memory to do the math she is working on. (Even when a person is very focused, unrelated thoughts or external distractions can use up a small amount of working memory.)



Your (and everyone's) working memory is very limited. If you have negative emotions about math and those emotions use up some of your working memory, you have less working memory to devote to actually doing the math. As a result, it will be more difficult to do the math you are working on.

Note – *the following charts do not mean that every person who has math anxiety has the same amount. They are only meant to show that math anxiety can use up some of a person's working memory. Some people have more anxiety about math than others. Some people do not feel any anxiety about math.*

Working Memory with Math Anxiety



The good news is that, if you do have math anxiety, it is possible to reduce it. And when you reduce it, you have more working memory to devote to actually doing the math you need to do.

Working Memory When Math Anxiety is Reduced



What Causes Math Anxiety?

If you have math anxiety, it might be the result of any or all of the following:

You have been exposed to negative messages about math. Those messages could have been from society in general, or from friends or parents who talked about how difficult math is or how much they dislike math. You might have even received negative messages about math from teachers. Many elementary school teachers say they have math anxiety and research suggests that such teachers unintentionally cause their students to have negative feelings about math. For many people, math anxiety develops in elementary school.

You have had difficulty with math in the past. One reason many people have difficulty with math is that they never memorized basic math facts in school. For a variety of reasons, many adults have never memorized math facts such as knowing the answers to single-digit addition, subtraction, multiplication, and division by heart (without having to do the calculations). For example, instead of being able to immediately say what $3 + 9$, or 6×7 is, some students need to stop and figure out the answer. Because those basic math facts are used in almost every other kind of math, not knowing them makes almost all other math more difficult. Remember that solving a math problem requires you to use working memory and your working memory is limited. Imagine that you are trying to figure out how much plywood you will need for a job and figuring that out requires you to know what 6×7 is. If you know, from memory, that $6 \times 7 = 42$ you do not have to use up some of your working memory for that part of the problem. You have all of your working memory available. However, if you have to use up some of your working memory to calculate 6×7 , you have less working memory to solve the plywood problem, so it is more difficult. A person who has not memorized basic math facts will struggle with more challenging math. That struggle can lead to frustration, which can cause negative feelings about math. Those negative feelings are math anxiety. Brushing up on your basic math facts may not eliminate your math anxiety, but it can make it easier for you to do the kinds of math you will need to do on the job. As you find it easier to do math, any anxiety you have about math might ease.

What Can I Do about It (If I think I have math anxiety)?

Brush up on your basic math facts. If you do not already know single-digit multiplication, division, addition, and subtraction (for example, what 6×7 equals) by heart and without having to calculate it, use the Multiplication, Division, Subtraction, and Addition *Brush Up* sheets to practice until you have them memorized. When you do, you will have more working memory available to do the math you will be required to do on the job.

Try to relax. Researchers who study math anxiety suggest that trying to relax before doing math might be the best way to reduce the negative effects of math anxiety.

One way to relax is to do a short relaxation exercise before doing math. In one study, when the following instructions were read to students before a test, their math anxiety was lower and their performance on the test was better (when compared with students who did not do the relaxation exercise). Try walking yourself through a relaxation exercise like this one, or another that you prefer. You can even relax yourself just by focusing on your breathing – just noticing your breath going in and out – for a few minutes.

Relax your muscles

Breathe deeply and exhale slowly 3 – 4 times

Let your body relax, put your arms at your sides, close your eyes, and let your mind go blank.

Now, sitting comfortably and breathing deeply, think of a safe place for you – at the beach, the mountains, a park, wherever you feel relaxed. Continue breathing and paint a picture in your mind of this safe place. Feel the cool breeze against your skin, the sun’s warmth, the sound of birds. Create an environment that is calming for you. Feel the quiet.

Another way to relax is to do some free writing before doing math. Research suggests that taking ten minutes or so to write privately about the emotions you are feeling before doing math or taking a test can help you improve your performance. Try to write openly about your thoughts and feelings about the math you are about to do, or about the quiz or test you are about to take. What you write is only for you – you do not need to share it with anyone. The researchers suggest that putting your emotions on paper frees up working memory, especially if you are feeling anxiety about the math you are about to do, or the test you are about to take. Your writing can help you put the math, or the quiz or test into perspective and help you see that it is not as consequential as you might think at first.

Focus more on the process of solving math problems than on whether you get the correct answer. Whether or not you get the correct answer, you will learn much more if you focus on how you arrived at your answer. Remember that making mistakes is essential to learning. It is impossible to learn a skill without making mistakes. If you are not making mistakes, you are probably not learning.

Ask for help. If you are having difficulty or feel stuck, do not hesitate to ask your instructor or another student for help. But do not just ask for the correct answer. Instead, walk them through the steps you used to solve the problem you are stuck on and tell them what questions you have. Ask them to show you the process to follow to solve the problem and where you might have gotten off track. Remember, to learn math you need to focus on the *process*, not just the correct answer.

Practice. Learning math has one important thing in common with every other skill you need on the job, like framing a house, welding steel, or pouring a concrete driveway, you should not

expect to be good at it right away and you will get better at it if you practice (and only if you practice!).

Remember the importance of a growth mindset. Just because you are good at other things, do not expect yourself to be good at construction math right away, especially if you have not done it before or if you have struggled with it in the past. **Be gritty!** Even if you struggle with it at first, **you can do it** if you follow the tips above and approach it with a growth mindset.

Do not take “can’t” for an answer. Never let anyone tell you that you cannot do math or anything else. That includes yourself. Try to pay attention to your self-talk. Cheer on your classmates, your co-workers and, most of all, yourself!

The information above comes from the following sources:

The article: [Math Anxiety: Can Teachers Help Students Reduce It?](#)

The book: [Why Don't Students Like School?](#)

The journal article: [The Role of Expressive Writing in Math Anxiety](#)

The journal article: [A Simple Visualization Exercise for Reducing Test Anxiety and Improving Performance on Difficult Math Tests](#)



Multiplication Brush Up

Knowing multiplication up to 10 x 10 by heart (without having to calculate it) will help you do construction math faster and more easily. Many people never learned the multiplication table by heart, or they have forgotten it. You can use this table to practice multiplication up to 10 x 10 until you have it memorized.

To use this table:

1. Pick one of the numbers in a gray square in the top row (for example, 2).
2. Multiply it by a number in a gray square in the far left-hand column (for example, 3).
3. Write the answer (to 2 x 3) in the white square where your two numbers intersect (for example, where the black circle is).

	0	1	2	3	4	5	6	7	8	9	10
0											
1											
2											
3			○								
4											
5											
6											
7											
8											
9											
10											

Multiplication Brush Up Answer Key

Use this answer key to check your answers as you brush up on your knowledge of single-digit multiplication using the *Multiplication Brush Up* practice table.

	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

Division Brush Up

Knowing division up to $10 \div 10$ by heart (without having to calculate it) will help you do construction math faster and more easily. Many people never learned the division table by heart, or they have forgotten it. You can use this table to brush up on division up to $10 \div 10$ until you have it memorized.

To use this table:

1. Pick one of the numbers from a white square (for example, 28).
2. Divide it by the number in the gray square at the top of the column (for example, 7).
3. Write the answer (to $28 \div 7$) in the gray blank that is in the same row as your first number (for example, where the black circle is).

	0	1	2	3	4	5	6	7	8	9	10
	0	6	12	18	24	30	36	42	48	54	60
	0	3	6	9	12	15	18	21	24	27	30
	0	1	2	3	4	5	6	7	8	9	10
	0	4	8	12	16	20	24	28	32	36	40
	0	10	20	30	40	50	60	70	80	90	100
	0	9	18	27	36	45	54	63	72	81	90
	0	8	16	24	32	40	48	56	64	72	80
	0	2	4	6	8	10	12	14	16	18	20
	0	7	14	21	28	35	42	49	56	63	70
	0	5	10	15	20	25	30	35	40	45	50
	0	0	0	0	0	0	0	0	0	0	0

Division Brush Up Answer Key

Use this answer key to check your answers as you brush up on your knowledge of single-digit division using the *Division Brush Up* practice table.

	0	1	2	3	4	5	6	7	8	9	10
6	0	6	12	18	24	30	36	42	48	54	60
3	0	3	6	9	12	15	18	21	24	27	30
1	0	1	2	3	4	5	6	7	8	9	10
4	0	4	8	12	16	20	24	28	32	36	40
10	0	10	20	30	40	50	60	70	80	90	100
9	0	9	18	27	36	45	54	63	72	81	90
8	0	8	16	24	32	40	48	56	64	72	80
2	0	2	4	6	8	10	12	14	16	18	20
7	0	7	14	21	28	35	42	49	56	63	70
5	0	5	10	15	20	25	30	35	40	45	50
0	0	0	0	0	0	0	0	0	0	0	0

Addition Brush Up

Knowing addition up to $10 + 10$ by heart (without having to calculate it) will help you do construction math faster and more easily. Many people never learned the addition table by heart, or they have forgotten it. You can use this table to brush up on addition up to $10 + 10$ until you have it memorized.

To use this table:

1. Pick one of the numbers in a gray square in the top row (for example, 5).
2. Add it to a number in a gray square in the far left-hand column (for example, 7).
3. Write the answer (to $5 + 7$) in the white square where your two numbers intersect (for example, where the black circle is).

	0	1	2	3	4	5	6	7	8	9	10
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

Addition Brush Up Answer Key

Use this answer key to check your answers as you brush up on your knowledge of single-digit addition by heart using the *Addition Brush Up* practice table.

	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12
3	3	4	5	6	7	8	9	10	11	12	13
4	4	5	6	7	8	9	10	11	12	13	14
5	5	6	7	8	9	10	11	12	13	14	15
6	6	7	8	9	10	11	12	13	14	15	16
7	7	8	9	10	11	12	13	14	15	16	17
8	8	9	10	11	12	13	14	15	16	17	18
9	9	10	11	12	13	14	15	16	17	18	19
10	10	11	12	13	14	15	16	17	18	19	20

Subtraction Brush Up

Knowing subtraction up to 10 – 10 by heart (without having to calculate it) will help you do construction math faster and more easily. Many people never learned the subtraction table by heart, or they have forgotten it. You can use this table to brush up on subtraction up to 10 – 10 until you have it memorized.

To use this table:

1. Pick one of the numbers from a white square (for example, 13).
2. Subtract the number in the gray square at the top of the column (for example, 9).
3. Write the answer (to $13 - 9$) in the gray blank that is in the same row as your first number (for example, where the black circle is).

	0	1	2	3	4	5	6	7	8	9	10
	6	7	8	9	10	11	12	13	14	15	16
	3	4	5	6	7	8	9	10	11	12	13
	1	2	3	4	5	6	7	8	9	10	11
	4	5	6	7	8	9	10	11	12	13	14
	10	11	12	13	14	15	16	17	18	19	20
	9	10	11	12	13	14	15	16	17	18	19
	8	9	10	11	12	13	14	15	16	17	18
	2	3	4	5	6	7	8	9	10	11	12
	7	8	9	10	11	12	13	14	15	16	17
	5	6	7	8	9	10	11	12	13	14	15
	0	1	2	3	4	5	6	7	8	9	10

Subtraction Brush Up Answer Key

Use this answer key to check your answers as you brush up on your knowledge of single-digit subtraction by heart using the *Subtraction Brush Up* practice table.

	0	1	2	3	4	5	6	7	8	9	10
6	6	7	8	9	10	11	12	13	14	15	16
3	3	4	5	6	7	8	9	10	11	12	13
1	1	2	3	4	5	6	7	8	9	10	11
4	4	5	6	7	8	9	10	11	12	13	14
10	10	11	12	13	14	15	16	17	18	19	20
9	9	10	11	12	13	14	15	16	17	18	19
8	8	9	10	11	12	13	14	15	16	17	18
2	2	3	4	5	6	7	8	9	10	11	12
7	7	8	9	10	11	12	13	14	15	16	17
5	5	6	7	8	9	10	11	12	13	14	15
0	0	1	2	3	4	5	6	7	8	9	10