

Divisibility Rules

A number is divisible by

2	If last digit is 0, 2, 4, 6, or 8
3	If the sum of the digits is divisible by 3
4	If the last two digits is divisible by 4
5	If the last digit is 0 or 5
6	If the number is divisible by 2 and 3
7	cross off last digit, double it and subtract. Repeat if you want. If new number is divisible by 7, the original number is divisible by 7
8	If last 3 digits is divisible by 8
9	If the sum of the digits is divisible by 9
10	If the last digit is 0
11	Subtract the last digit from the number formed by the remaining digits. If new number is divisible by 11, the original number is divisible by 11
12	If the number is divisible by 3 and 4

Divisibility Tests for 2, 3, 5, 7 and 11

This shows you the divisibility tests for 2, 3, 5, 7, and 11, so you can tell if those numbers are factors of a given number or not without dividing.

Divisibility Test for 2: The last digit is 0, 2, 4, 6, or 8.

Divisibility Test for 3: The sum of the digits is divisible by 3.

Divisibility Test for 5: The last digit is 0 or 5.

Divisibility Test for 7: Cross off last digit, double it and subtract. Repeat if you want. If new number is divisible by 7, the original number is divisible by 7.

Divisibility Test for 11: For a 3-digit number, sum of the outside digits minus the middle digit must be 0 or 11.

11 Free Math Sites for Kids

Math Site	URL
Fun Brain	http://Funbrain.com
Math Blaster	http://Mathblaster.com
Multiplication.com	http://multiplication.com
Learn Zillion	http://LearnZillion.com
Hooda Math	http://HoodaMath.com
Manga High	http://mangahigh.com
Math Game Time	http://MathGameTime.com
Math Playground	http://MathPlayground.com
CryptoKids	http://www.nsa.gov/kids/home.shtml
BBC KS2 Bitesize	http://www.bbc.co.uk/schools/ks2bitesize/
Cool Math Games	http://www.coolmath-games.com/

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Reference Tools

A Notetaking Organizer can be used to write notes, vocabulary, and questions about a topic. In the space on the left, write important vocabulary or formulas. In the space on the right, write notes about the topic. In the space at the bottom, write questions about the topic.

Write important vocabulary or formulas in this space.

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c}$$
$$= \frac{a \cdot d}{b \cdot c}$$

(where $b, c,$ and $d \neq 0$)

Dividing fractions

To divide a number by a fraction, multiply the number by the reciprocal of the fraction.

Example:

$$\frac{1}{5} \div \frac{3}{4} = \frac{1}{5} \times \frac{4}{3} = \frac{1 \times 4}{5 \times 3} = \frac{4}{15}$$

Write your notes about the topic in this space.

Write your questions about the topic in this space.

How do you divide a mixed number by a fraction?

Quick Review

- Cross multiply when an equal sign is between fractions.
- Multiply the numerators and denominators when there is a multiplication symbol between fractions.
- To express a whole number as an improper fraction, put it over a denominator of 1.
- To write the reciprocal of a number, write the number as a fraction. Then invert the fraction. So, the reciprocal of a fraction $\frac{a}{b}$ is $\frac{b}{a}$, where a and $b \neq 0$.

Key Ideas

Adding and Subtracting Decimals

- To add or subtract decimals, write the numbers vertically and line up the decimal points.
- Then bring down the decimal point and add or subtract as you would with whole numbers.

Multiplying Decimals by Whole Numbers

- Multiply as you would with whole numbers.
- Then count the number of decimal places in the decimal factor.
- The product has the same number of decimal places.

Multiplying Decimals by Decimals

- Multiply as you would with whole numbers.
- Then add the number of decimal places in the factors.
- The sum is the number of decimal places in the product.

Dividing Decimals by Whole Numbers

- Place the decimal point in the quotient above the decimal point in the dividend.
- Then divide as you would with whole numbers.
- Continue until there is no remainder.

Dividing Decimals by Decimals

- Multiply the divisor *and* the dividend by a power of 10 to make the divisor a whole number.
- Then place the decimal point in the quotient and divide as you would with whole numbers.
- Continue until there is no remainder.

What's the Point?

The ability to work with fractions and decimals is very useful in real life for events like baking multiple batches of cookies for a bake sale. Bake some of your student's favorite cookies and try doubling or tripling the batch. Have them figure out how much of each ingredient is needed to make the cookies. For example, if a single batch calls for $\frac{3}{4}$ cups of sugar, then a triple batch would call for $3 * \frac{3}{4}$ cups of sugar.

The STEM Videos available online show ways to use mathematics in real-life situations. The Chapter 2: Space is Big STEM Video is available online at www.bigideasmath.com.



Parent Newsletter

Chapter 2: Fractions and Decimals

Objectives

Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.

Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Key Term

Two numbers whose product is 1 are **reciprocals**.

Games

- Fun with Fractions
- Pick Your Polygon
- Name the Number
- Let's Go Shopping
- Amazing Decimals

These are available online in the *Game Closet* at www.bigideasmath.com.

Essential Questions

What does it mean to multiply fractions?

How can you divide by a fraction?

How can you model division by a mixed number?

How can you add and subtract decimals?

How can you multiply decimals?

How can you use base ten blocks to model decimal division?

Students will...

Use models to multiply fractions.

Multiply fractions by fractions.

Write reciprocals of numbers.

Use models to divide fractions.

Divide fractions by fractions.

Use models to divide mixed numbers.

Divide mixed numbers.

Use models to add and subtract decimals.

Add and subtract decimals.

Use models to multiply decimals.

Multiply decimals.

Use models to divide decimals.

Divide decimals.

Solve real-life problems.



Key Ideas

Multiplying Fractions

- Multiply the numerators and multiply the denominators.
- $\frac{a}{b} \cdot \frac{c}{d} = \frac{a \cdot c}{b \cdot d}$, where $b, d \neq 0$.

Multiplying Mixed Numbers

- Write each mixed number as an improper fraction.
- Then multiply as you would with fractions.

Dividing Fractions

- To divide a number by a fraction, multiply the number by the reciprocal of the fraction.
- $\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c} = \frac{a \cdot d}{b \cdot c}$, where $b, c, \text{ and } d \neq 0$

Dividing Mixed Numbers

- Write each mixed number as an improper fraction.
- Then divide as you would with proper fractions.

MATH STUDY SKILLS

MULTIPLICATION TABLE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32
3	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64
5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
6	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
7	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112
8	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128
9	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144
10	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
11	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176
12	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192



HELPING YOUR CHILD WITH TODAY'S MATH

Foster the skills they need to succeed in school and life

What is "today's math?"

Today's math is designed to help your child compete and thrive in a rapidly changing world—academically, professionally, financially and socially.

Math education should prepare your child to graduate from high school, get into college, start a career, and make smart, informed decisions in every area of life. To do this, today's math education may look different than it did when you were a child. That's because the world is different.

We live in a different economy, with different jobs, requiring different skills. For your child to compete in top fields like science, medicine and technology, or even to create their own path, math—and the mental problem-solving skills it instills—is critical.

Math is also essential to making good decisions in daily life—whether applying for financial aid, comparing mortgage rates or planning for retirement.

Today's math is meant to prepare students to manage and enrich their lives.

What does today's math mean for my child?

The idea behind today's math is not just to do it, but also to understand how and why we do it. Students do not just learn numbers, equations, angles and theorems, but also put in context why these concepts matter in life.

As a basic example, let's consider a second-grade classroom. In this classroom, two apples plus two apples still equal four apples. But the teacher asks students to go a step further. How many apples would they need for a classroom party? What is the cost to

buy those apples? How much money do they need to have in the class budget?

Working through this series of questions helps your child develop problem-solving skills, which they can apply over and over to everyday life. The same goes for solving complex equations in a tenth-grade classroom. The students don't have to become mathematicians to apply the logical thinking they develop. Employers in every field value this skill.

Because of this deeper approach to learning, math problems may take a bit longer, but there also may be fewer assigned. Help your child stay focused. Encourage them to talk through the problem and the solution, and ask them to demonstrate their process as well as the answer.

If you visit your child's classroom, you may also see an emphasis on group learning. That's because working in teams builds greater understanding, creativity and innovation—all in high demand in the work world, and key to enriching every aspect of your child's life.



How can you support your child's math education

Make math fun and relevant to life

These are just a few examples of how you can incorporate math into daily life. Ask your child to help you:

- ✓ Estimate the cost of groceries in your cart.
- ✓ Pay your bills.
- ✓ Determine how many gallons of gas you can buy with a certain amount of money.
- ✓ Figure out how many calories you need to burn to work off snacks you ate during the day.
- ✓ Calculate the cost of school lunch for the week or month.
- ✓ Determine how long your child will have to save their allowance in order to buy a new toy.
- ✓ Compare the costs of different cell phone plans.
- ✓ Determine how much paint you need to paint your child's room.
- ✓ Figure out if it's more cost-effective to lease or buy a car.
- ✓ Measure your garden or window box to determine how many plants and vegetables you can fit.



Show how math is all around us:

Point out uses for math whenever you can—in the store, in the car or on vacation.

Be positive:

If you cried, "This is stupid, I'll never use this," while doing math when you were in school, you're not alone. It was a common refrain. And that's why the curriculum has evolved—to make math relevant to the real world. So if you get frustrated helping your child with homework, turn that frustration into determination. It's okay to tell your child you don't understand something. But make sure you also tell them how important it is to work through the problem until you arrive at an answer. Because they will use what they're learning some day.

Talk to teachers if you don't understand something:

If you feel ill-equipped to help your child with homework at times, or are confused about how they are being evaluated, talk to their teacher. Teachers know that parents have a lot of questions, and they are used to talking about today's math. Find out how you can work together with your child's teacher to support your child. Your state department of education also has materials explaining curriculum and assessments.

Set high expectations:

We know that every child is capable of succeeding in various math areas, including geometry, statistics, algebra, and calculus. It's not just a select few who go on to more advanced topics. Push your child to pursue math all the way to their senior year. They'll have a better chance of getting into and succeeding in college or advanced career and technical education training and going into a challenging and fulfilling career.



Resources

PTA Math Information for Parents:

pta.org/parents

Other Resources

There is a wide range of other Parents' Guides to help you ensure your child thrives at school. Here are just a few examples:

- ✓ Raising Ready Readers—Helping Your Child Learn to Read
- ✓ Raising Scientifically Literate Children
- ✓ Preparing Your Child for School

For these and other guides, visit NEA.org/Parents/NEAResources-Parents.html or pta.org/familyguides



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