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Example Video Questions Lesson Share to Google Classroom Example Video Questions Lesson Share to Google Classroom We keep the whole number 6 the same.We turn our division sign into a multiplication sign.We flip the fraction we are dividing by.6 2 / 3 becomes 6 3 / 2 .We multiply the 6 by the numerator on the top.6 3 = 18.We divide 18 by the denominator on the bottom of the fraction.18 2 = 9.6 2 / 3 = 9. Dividing a whole number by a fraction tells us how many of these fractions add together to make the whole number. When teaching division by fractions, it is always best to start with a visual model. We can first look at the division of whole numbers by whole numbers to remember what the division tells us. Here we have 6 2. This division means, How many twos go into 6? We can see that 2 goes into six 3 times. Therefore 6 2 = 3. We can think of division by fractions in a similar way. Here we have 2 1 / 2 shown with a model. This division means, How many halves go into 2? It can help to teach division of fractions using a visual model. Each whole is made up of two halves. We can count and see that 4 halves make 2 wholes. We can see that the 2 in the whole number can be multiplied by the 2 in the fraction to give us our answer of 4. Whilst visual models are useful for first introducing division by fractions, it is useful to have a quicker, written method. Division is the opposite of multiplication and so, we can turn the division into a multiplication provided that we flip the fraction. We use the three steps of: to divide whole numbers by fractions. We keep 2 as 2. We turn the division into a multiplication. We flip the fraction 1 / 2 to become 2 / 1. We can multiply the whole number by the number on top of the fraction and divide by the number on the bottom of the fraction to work this out. 2 2 = 4 and 4 1 = 4 2 1 / 2 = 4. This means that 4 of the fraction 1 / 2 make up the whole number of 2. Here is another model of dividing whole numbers by fractions. We have 6 2 / 3. This question is asking, How many of the fractions 2 / 3 make 6 wholes? The fraction of two thirds is 2 out of 3. We can see this fraction shown in the model below. every 2 blocks shaded is another two thirds. We can see that there are 9 separate lots of two thirds that can fit inside 6 wholes. 6 2 / 3 = 9 because 2 / 3 goes into six 9 times. We can see that we can use our 3 steps of to divide this whole number by a fraction and get the same answer. We rewrite 6 2 / 3 as 6 3 / 2. We multiply 6 by the 3 on top and then divide it by the 2 on the bottom to get our answer. 6 3 = 18 and then 18 2 = 9. This is the same answer we got by drawing our visual model but it is more of a methodical process that does not require a drawing. How to Divide a Whole Number by a Fraction To divide a whole number by a fraction: Keep the whole number the same. Change the division sign into a multiplication sign. Flip the fraction you are dividing by. Multiply the whole number by the number on the top of this flipped fraction. Divide this result by the number on the bottom of the flipped fraction. We will use these steps to work out the following example. We have the division of the whole number 5 by the fraction 5 / 6 . The first step is to keep the whole number 5 as 5. The second step is to turn the division sign, , into a multiplication sign, . The third step is to flip the fraction 5 / 6 to 6 / 5 . 5 5 / 6 can be written as 5 6 / 5 . To work this out, we use use steps 4 and 5. The fourth step is to multiply the whole number, 5, by the numerator on the top of the flipped fraction, which is 6. 5 6 = 30 The fifth step is to divide this result by the denominator on the bottom of the flipped fraction, which is 5. 30 5 = 6 And so, 5 5 / 6 = 6. Here is another example of dividing whole numbers by fractions. We have 8 1 / 4 . We keep the 8 as 8 and turn the division into a multiplication. We flip the fraction 5 / 6 to become 6 / 5 . 8 1 / 4 can be written as 8 4 / 1 . We multiply the 4 by 8 to get 32. Then we divide 32 by 1, which is still 32. 8 1 / 4 = 32. This means that 32 quarters make 8 wholes in total. Now try our lesson on Translating Shapes where we learn what it means to translate a shape. Translating Shapes Use some of the same strategies to teach multiplication for teaching division in 3rd grade. Teaching division in 3rd grade can result in the case of the guzintas. What do you mean, you ask? You remember4 guzinta 36 or 5 guzinta 25. How many of us use to say it out loud as we learned how to divide? Instead, get rid of the guzintas by teaching division to 3rd graders as how many groups of 4 are in 36? What else matters with how to teach division to kids? For starters, teaching a solid conceptual understanding of division. Using and solving real-life division problems which relate to students. And curing the guzintas! We also need to be careful we dont omit a certain type of division problem. What do I mean? When third-graders learn to divide whole numbers we emphasize the quotient will be less than the dividend. But what happens when we divide a whole number by a fraction (6)? We get a result greater than the dividend! Teaching division using measurement situations will build a solid foundation for later division of fractions in grade 5 and beyond. I will explain more about measurement division later. Teaching division to 3rd graders has many complexities. In this post, youll learn critical strategies for teaching division (both partitive and quotative) to kids conceptually while building procedural fluency. No more guzintas or wondering what exactly happens in a division problem. One of the first strategies teachers use to teach multiplication is equal groups. Teachers can also use the same strategy for teaching division to kids. This type of division is referred to as partitive division. While multiplication is an efficient algorithm for finding a total quantity from joining equal groups, division inversely finds the number of groups or the amount in each group. Understanding the context of a story helps students imagine real-life scenarios of how this occurs. For example, most kids like to bake. If you baked 24 cookies, how many friends could you give cookies to if you gave each friend 8 cookies? or 6 cookies? How about 4 cookies? or 12 cookies? Using dividends (the starting number or total quantity) with multiple divisors (the number that divides) allows students to explore how division works. After all, we want to be fair and share the cookies equally! Start with presenting scenarios such as the one above to students. Use the CRA (concrete-representational-abstract) approach for teaching division. Have students work in pairs to find solutions to how many cookies the friends would get if there were 2, 3, 4, 6, 8, or 12 friends. A wonderful companion book showing this process in story When the Doorbell Rang by Pat Hutchins (I have no affiliate links or association with Amazon). Give students math tools such as tiles, counters, beans, or any other object which can be easily grouped. Provide sentence frames such as I had 24 cookies so I gave my _____ friends _____ cookies each (I had 24 cookies so I gave my 3 friends 8 cookies each). Have students make visual representations of their solutions. In other words, go from concrete to represenational. Finally, teach the abstract by showing students how to model their solutions with math24 3 = 8; 24 6 = 4; etc. introduce the academic vocabulary of dividend, divisor, quotient and the symbol for division. Students must find the connection to multiplication when learning to divide. Some students might immediately connect when they start making equal groups to divide cookies. But some may not, so we need to make the connection explicit for those students. Since students used arrays to multiply, we can teach division in 3rd grade the same way. In 2nd grade, students lined up objects in rows to use repeated addition to find the total. We can do the same with an array by having students start with a total, then use repeated subtraction to see how many rows (or columns) we can make. This is also a form of partitive division. What if instead of giving out cookies, we gave out brownies? Have students work in pairs to find solutions to divide 36 brownies among 2, 3, 4, 6 and 9 friends. Students should use math tools (tiles, paper squares, beans, counters, etc.) to make rows depending on the divisor (2, 3, 4, 6 or 9). Emphasize to students they are to construct an array so rows and columns should be lined up properly and evenly. As the students construct the rows or columns, they are conceptually subtracting from the total such as taking 4 more away from the total to make another row/column. Provide sentence frames such as 36 brownies arranged in rows of _____ makes _____ rows (36 brownies arranged in rows of 4 makes 9 rows). Once the array has been built, have students make a visual respresentation of their solutions. Then, ask students to model the solution with mathematics by creating a division equation. Finally, ask the students to write a multiplication equation matching the array. Ask students to notice and wonder once the division and multiplication equations are written (correctly). What do they notice? What do they wonder? Guide the discussion to understand and explain how a division problem is a missing factor problem. Where do the factors in the multiplication equation show up in the division equation? Do the factors in the multiplication equation represent the same quantities in the division equation? How is the quotient and product related? How can we use multiplication to solve division problems? Students have been taught division using equal groups and arrays by this point. These strategies build the concept of division by finding each groups quantity or the number of groups formed. The teaching of division in 3rd grade usually stops here. But theres one more strategy to consider. One aspect of teaching division in 3rd grade is sometimes we dont teach division around measurement problems. Whats a measurement problem? What if I had 6 feet of rope I wanted to cut into 2-foot segments. How many pieces could I cut? This type of division is referred to as quotative division. How does this differ from the standard division problem? In the situation presented, we know: the total (length of the rope) we know how many in each group (2-foot segments) but were trying to solve for how many groups (how many segments). Though this seems straightforward, it will become more challenging once students in later grades divide by fractions. What if we cut the segments in foot increments (6)? You would end up with 12 pieces which to students seems counterintuitive when dividing. So we have to give students opportunities to work with measurement division problems so later they have the experience to understand the context of the problem involving fractions. Also, the rope can be thought of as a number line or measuring ruler. Use a number line as a math tool when teaching division to 3rd graders. Use measurement scenarios such as the one above. Use the CRA (concrete-representational-abstract) approach in which the concrete model can be a ruler or number line. Have students work in pairs to find how many segments can be cut from a 12 inch (use 30 cm or 24 cm if using metric) piece of string if you cut segments of 2, 3, 4, or 6 inch segments. Give each pair 4 5 strings measuring 12 inches each. Give each pair a simple ruler having inches (or centimeters if using metric). Have students use the ruler to divide by 2, 3, or 6 inch segments. If your students are not familiar with using rulers (2nd grade Common Core Math Standards specifically state measuring to the nearest half-inch), you might do a separate lesson on using a ruler to the nearest inch. I would recommend the students cut the string into the segments (have extra strings on hand for miscalculations when cutting) Provide sentence frames such as a ____ inch string can be divided into ____ segments of ____ inches each (a 12 inch string can be divided into 3 segments of 4 inches each). Once the strings have been cut into various segment lengths, have students make a visual represenation of their work. This is when you can supply number lines to substitute for the ruler (because they are the same thing!). Then, ask students to model the solution with mathematics by creating a division equation. Challenge students to use the missing factor approach by writing an appropriate multiplication sentence. Are there any other considerations we need to know for teaching division to kids? What about resources? Do you have resources to teach division? I have a FREEBIE Im offering if you sign up for my newsletter. It contains 6 pictures you can use to launch a division problem based on equal groups, arrays, or measurement. Based on the Notice and Wonder routine, show the image and have students observe the pictures. Shells a collection of 12 fancy seashellsDogs and cats a collection of 18 dogs or cats (and one mouse not counted)Carton of eggs 18 eggs arranged in rows of 6Rows of crayons 24 crayons arranged in 3 rowsUnwound rope a length of unwound rope (you determine length)Yellow ribbon a length of unwoud ribbon (you determine length) A recent addition to my store resources includes a new animated PowerPoint for teaching division to 3rd graders (or review for 4th and 5th graders, intervention students, etc.). The PowerPoint is specifically made to teach dividing through equal groups, arrays, and measurement (number lines). The PowerPoint includes 4 separate lessons which build on each other What is Division? Teaching Division with Equal Groups Division with Arrays Use Measurement Situtations to Teach Division as Subtraction Each lessonhas explicit examples through animation. Each lesson includes the following components: concept building with explicit examples with animation mathematical questions to elicit discourse and develop reasoning skills. printables for each lesson coordinate with selected slides with hands-on activities to go from concrete understanding to connecting to multiplication symbols and numbers. Sentence frames to help frame understanding and support English Language Learners Each slide also has sounds to enhance the animation and keep students engaged though it can be turned off by turning down the volume. I hope the strategies presented here to teach division to kids were helpful and eliminated any case of the guzintas. What strategies to do have for teaching division? Share them in the comments! Worksheets for Grade 6Lesson 1 SummaryStudents use visual models such as fraction bars, number lines, and area models to show the quotient of whole numbers and fractions. Students use the models to show the connection between those models and the multiplication of fractions. Students divide a fraction by a whole number.The following diagrams give some examples of dividing a fraction by a whole number. Scroll down the page for more examples and solutions.Lesson 1 ClasswerkLesson 1 Opening ExerciseDraw a model of the fraction 5/6. Describe what the fraction means.A fraction shows division of the numerator by the denominator. In other words, a fraction shows a part being divided by a whole. Fractions are numbers; therefore, they can be added, subtracted, multiplied, or divided.Example 1 Maria has 3/4 lb. of trail mix. She needs to share it equally among 6 friends. How much will each friend be given? What is this question asking us to do?How can this question be modeled?Example 2Imagine that you have 2/5 of a cup of frosting that you need to share equally between three desserts. How would we write this as a division question? How can we show that we are dividing two-fifths into three equal parts?Exercises 15For each question below, rewrite the problem as a multiplication question. Then model the answer.1/2 61/3 31/5 43/5 42/3 4Show Step-by-step SolutionsShow Step-by-step Solutions ExercisesFind the value of each of the following.1/453/551/54Solve. Draw a model to support your solution.3/5 pt. of juice is poured equally into 6 glasses. How much juice is in each glass?Show Step-by-step SolutionsLesson 1 Exit TicketFind the quotient using a model. Problem SetRewrite each problem as a multiplication question. Model the answer. Show Step-by-step Solutions Try out our new and fun Fraction Concoction Game.Add and subtract fractions to make exciting fraction concoctions following a recipe.There are four levels of difficulty: Easy, medium, hard and insane. Practice the basicsof fraction addition and subtraction or challenge yourself with the insane level. We welcome your feedback, comments and questions about this site or page. Please submit your feedback or enquiries via our Feedback page. How to divide fractions is one of those topics I find myself needing to refresh on every so often. For me dividing fractions is definitely one of those "don't use, lose" situations. So this post came from me refreshing my memory of fraction division. But why now? This tweet:After sharing Howie Hua's tweet in our Visual Math Facebook group, it got me reminiscing on fraction division. And full disclosure, I had never considered dividing across as a thing to do. I'm 42 with a Masters in Math for Teaching and this never crossed my mind. I'm not usually too worried about how I come across, but I did appreciate other teachers in the group admitting they never thought of this, either. It allowed us all to learn something new together, and I love when this happens.In one graduate class we had to write papers on the various algorithms taught in math and why they work. Fraction division was one of those algorithms, and after more than a few "redo"s written at the top of my paper, I finally handed in a paper that could actually be graded. Needless to say that was a taxing class.Keep, change, flip. Why? I hope to answer that with the 3 examples in this post.Example 1: (2/3)(1/2)Division asks, "How many of these fit into that?" For 10 divided by 2, for example, we're asking, "How many 2's fit into 10?" We ask the same question when we divide fractions, it's just a little harder to see.In our first example (2/3)(1/2), we're asking, "How many 1/2s fit into 2/3?" It would be easier to answer this question if our fractions were broken into the same number of parts. By creating a common denominator, it will be easier to see how many will fit.By creating the common denominator 6, we can then see that all 3 of our green bars will fit into the space taken up by our blue bars. There is even room for one more! So all of the green bars (1 whole) can fit into the blue space and 1 more bar out of the 3 (1/3). So (2/3)(1/2) = 1 and 1/3.Here is a video explaining:The connection to Keep Change Flip:When I posted this video on my Instagram feed, one teacher pressed me for the connection to the keep change flip (aka: multiplying by the reciprocal) standard algorithm. Like anything in math, there is more than one good way to make a connection. I personally like bringing it back to whole numbers when explaining why keep change flip works:If 10 divided by 2 is 5,Then half of 10 is 5.So 10 divided by 2 is 1/2 of 10.We can multiply by a reciprocal for division. If you'd like to link the keep change flip algorithm straight to this fraction example, here is how that can be done:We can see that the numerator of the second fraction becomes the denominator of our answer. This is because we are asking, "How many of the second fraction's numerator (bars) can we fit into the first fraction's numerator [after we create a common denominator]?"Example 2: (1/2)(2/3)This example is just like example 1, we just switched the fractions' placements, which is fun because it reinforces that division is not commutative.In our second example (1/2)(2/3), we're asking, "How many 2/3s fit into 1/2?"By creating a common denominator, we can easily see that 3 of the 4 blue bars will fit into the space occupied by the green bars. So (1/2)(2/3)=(3/4).Example 3: (4/5)(2/3)Sometimes creating a common denominator with just columns would get too messy to be helpful, so we can create a grid to show it instead. We can always do this, I just prefer columns when there is a chance to use them because I feel they are easier to see.With (4/5)(2/3), our common denominator is 15, so we can create a grid of 15 spaces. 4/5 takes up 12 of these spaces and 2/3 takes up 10 of these spaces. So all of our 2/3 can fit into 4/5, plus an additional 2. We can then see that (4/5)(2/3) = 1 and 2/10.Here is a video explaining this example:Summary:All three fraction by fraction division examples from this post are in this video:These fraction multiplication and division references are included in my 6th Grade Math Word Wall.I also just created this set of fraction division task cards to go along with this post. The cards can be laminated and used with a dry erase marker so that they can be reused.Dividing fractions using models tasksAnd for a fun review, this fraction review digital math escape room. In puzzle #5, students are asked to multiply and divide fractions. Students figure out the 4 answers then type their 4-letter code into the answer-validated Google Form to unlock the puzzle.Fraction review digital math escape roomI hope this post has been helpful!-Shana McKay. Scaffolded Math and ScienceBrowse all fraction activities here.Free math resource library Make math practice fun, active, and effective with this huge bundle of 65 printable Math Scoot games designed for Kindergarten through 4th Grade (primarily K-1 skills included. Please read contents!)! This low-prep, high-engagement resource covers essential math skills like addition, subtraction, multiplication, counting, fractions, time, place value, geometry, number sense, money, graphs, and more. Perfect for whole-group activities, math centers, early finishers, or math around the room Here, in this lesson, we learn how to use area model to divide a whole number by a fraction. There is a whole number and a fraction that divides that whole number. We consider a whole number as that many squares as the number indicates.We divide each of the squares into that many parts as the denominator of the fraction indicates. We find the result of this division by counting the total number of parts of the squares. Divide 3 $\frac{1}{2}$ using an area model.SolutionStep 1:The whole number 3 is taken as three squares. As the fraction is one-half, each of the squares is divided into two halves. Step 2:Now the halves in all three squares are counted and found to be 6. This is the answer we get by dividing 3 by $\frac{1}{2}$.So, 3 $\frac{1}{2}$ = 6Problem 1Divide 5 $\frac{1}{3}$ using an area model. SolutionStep 1:Dividing 5 into one-thirds can be modeled as follows:Consider 5 squares as 5 wholes. Each of the squares is further divided into three parts or one-thirds. Step 2:Then counting the total number of such parts of the squares or wholes gives the answer which is 15.So, 5 $\frac{1}{3}$ = 15Problem 2Divide 6 $\frac{1}{2}$ using an area model.SolutionStep 1:Dividing 6 into one-halves can be modeled as follows:Consider 6 squares as 6 wholes. Each of the squares is further divided into two parts or one-halves.Step 2:Then counting the total number of such parts of the squares or wholes gives the answer which is 12.So, 6 $\frac{1}{2}$ = 12 When dividing whole numbers by fractions, what should we do? When a whole number is divided by a fraction, the number of groups of the fraction that fit inside the whole is determined. Multiplying the given whole number by the reciprocal fraction is the most popular way to divide whole numbers by fractions. We will learn more about dividing whole numbers by fractions in this article and the different ways of doing it. When a whole number is divided by a fraction, the number of groups of the fraction that fit inside the whole is determined. Let us first look at dividing whole numbers. Let us say 6 3. We want to find out how many threes makeup six. The figure below illustrates 6 3 = 2. We can say that if we divide 6 by 3, there will be 2 equal groups of 3. The division of whole numbers by fractions works the same way since we also want to identify how many equal groups of the fraction fit in the given whole number. Let us say, for example, we want to calculate 6 . Here, we want to identify how many fit the whole number 6. Using a visual model or a diagram, let us look at how we divide 6 by . Let us use 6 squares, and since the denominator of is 4, we shall divide each square by 4. Hence, we have, Now, since we are dividing the whole number by the fraction , we will create groups with 3 squares. The figure below shows the different colors of each group with three squares. Notice that each square has one leftover part that remains unshaded. We can still form groups using three squares. The number of equal groups is the answer to the division problem. Therefore, 6 = 8. The number of groups of the fraction that fit inside the whole is found when a whole number is divided by a fraction. When dividing whole numbers by fractions using diagrams, we first draw shapes to represent whole numbers and divide each shape in reference to the fractions denominator. For example, we want to calculate 523; the figure below shows five squares since it is the given whole number, and each square is divided into 3 equal parts in reference to the fractions denominator. To represent the fraction 23, 2 parts are shaded in each square. We will then count the number of groups of 23. Notice that we have formed 7 groups and 1 piece as a leftover. The 7 groups will give the whole number answer to the division problem, but the leftover piece must be interpreted and compared over to a complete group. In the illustration above, each group has 2 parts. The 1 piece will then be interpreted as 12. Combining the whole number answer and the fractional number gives us 7 12. Therefore, 5 23 = 7 12. The processes of dividing whole numbers by fractions are as follows: Step 1:Keep the same whole number.Step 2:Change the division symbol into the multiplication symbol.Step 3:Flip the fraction.Step 4:Multiply the whole number by the flipped fraction.Step 5:Simply, if necessary. Example 1 Calculate 4 12. Solution Let us follow the steps of dividing whole numbers by fractions. Step 1:We will keep the same whole number, 6.Step 2:Change the division symbol into the multiplication symbol.Step 3:Flip the fraction.Since the given fraction is , it becomes 2/1.Step 4:Multiply the whole number by the flipped fraction.Multiply 4 by 2, then divide the answer by 1.4 $\frac{2}{1}$ = $\frac{8}{1}$Step 5:Simply, if necessary. $\frac{8}{1}$ is equal to 8 when simplified. Example 2 Calculate 5 34. Solution Let us follow the steps of dividing whole numbers by fractions. Step 1:We will keep the same whole number, 5.Step 2:Change the division symbol into the multiplication symbol.Step 3:Flip the fraction.Since the given fraction is , it becomes $\frac{4}{3}$.Step 4:Multiply the whole number by the flipped fraction.Multiply 5 by 4, then divide the answer by 3.5 $\frac{4}{3}$ = $\frac{20}{3}$Step 5:Simply, if necessary. $\frac{20}{3}$ is equal to 6$\frac{2}{3}$ when simplified or as a mixed fraction. Example 3 Solve 12 $\frac{4}{7}$. Solution Let us follow the steps of dividing whole numbers by fractions. Step 1:We will keep the same whole number, 12.Step 2:Change the division symbol into the multiplication symbol.Step 3:Flip the fraction.Since the given fraction is $\frac{4}{7}$, it becomes $\frac{7}{4}$.Step 4:Multiply the whole number by the flipped fraction.Multiply 12 by 7, then divide the answer by 4.12 $\frac{7}{4}$ = $\frac{84}{4}$Step 5:Simply, if necessary. $\frac{84}{4}$ is equal to 21 when simplified. Example 4 Solve 13 $\frac{5}{6}$. Solution Let us follow the steps of dividing whole numbers by fractions. Step 1:We will keep the same whole number, 13.Step 2:Change the division symbol into the multiplication symbol.Step 3:Flip the fraction.Since the given fraction is $\frac{5}{6}$, it becomes $\frac{6}{5}$.Step 4:Multiply the whole number by the flipped fraction.Multiply 13 by 6, then divide the answer by 5.13 $\frac{6}{5}$ = $\frac{78}{5}$Step 5:Simply, if necessary. $\frac{78}{5}$ is equal to 15$\frac{3}{5}$ when simplified or as a mixed fraction. Example 5 Calculate 9 $\frac{3}{8}$. Solution Let us follow the steps of dividing whole numbers by fractions. Step 1:We will keep the same whole number, 9.Step 2:Change the division symbol into the multiplication symbol.Step 3:Flip the fraction.Since the given fraction is $\frac{3}{8}$, it becomes $\frac{8}{3}$.Step 4:Multiply the whole number by the flipped fraction.Multiply 9 by 8, then divide the answer by 3.9 $\frac{8}{3}$ = $\frac{72}{3}$Step 5:Simply, if necessary. $\frac{72}{3}$is equal to 24 when simplified. Example 6 Solve 25 $\frac{1}{5}$. Solution Let us follow the steps of dividing whole numbers by fractions. Step 1:We will keep the same whole number, 25.Step 2:Change the division symbol into the multiplication symbol.Step 3:Flip the fraction.Since the given fraction is $\frac{1}{5}$, it becomes $\frac{5}{1}$.Step 4:Multiply the whole number by the flipped fraction.Multiply 25 by 5, then divide the answer by 1.25 $\frac{5}{1}$ = 125.Step 5:Simply, if necessary. 125 is the final answer. Multiplying the reciprocal of the fraction is a common method for dividing a whole number by a fraction. When we say by the reciprocal of the fraction, it means that we switch the numbers placed in the numerator and the fractions denominator. Let us say, for example, we have $\frac{3}{4}$, and its reciprocal is $\frac{4}{3}$. Thus, in dividing a whole number by a fractional number, we must multiply the given whole number by the reciprocal of the given fraction. Example 1 Find 4 $\frac{3}{2}$. Solution Let us first change the whole number 4 to a fraction by making it $\frac{4}{1}$. Then, multiply it by the reciprocal of the fraction 32, which is 23. Thus, we have, $\frac{4}{1}$ $\frac{2}{3}$ Now that we must multiply two fractions, we will first multiply the numerators and then the denominators. $\frac{4}{1}$ $\frac{2}{3}$ = $\frac{8}{3}$ Therefore, 4 $\frac{3}{2}$ = $\frac{8}{3}$ or 2 $\frac{2}{3}$ when simplified or as a mixed fraction. Example 2 Calculate 7 $\frac{5}{6}$. Solution Let us first change the whole number 7 to a fraction by making it $\frac{7}{1}$. Then, multiply it by the reciprocal of the fraction $\frac{5}{6}$, which is $\frac{6}{5}$. Hence, we have, $\frac{7}{1}$ $\frac{6}{5}$ Now that we must multiply two fractions, we will first multiply the numerators and then the denominators. $\frac{7}{1}$ $\frac{6}{5}$ = $\frac{42}{5}$ Therefore, 7 $\frac{6}{5}$ = $\frac{42}{5}$ or 8 $\frac{2}{5}$ when simplified or as a mixed fraction. Example 3 Solve 11 $\frac{2}{3}$. Solution Let us first change the whole number 11 to a fraction by making it $\frac{11}{1}$. Then, multiply it by the reciprocal of the fraction $\frac{2}{3}$, which is $\frac{3}{2}$. Thus, we have, $\frac{11}{1}$ $\frac{3}{2}$ Now that we must multiply two fractions, we will first multiply the numerators and then the denominators. $\frac{11}{1}$ $\frac{3}{2}$ = $\frac{33}{2}$ Therefore, 11 $\frac{2}{3}$ = $\frac{33}{2}$ or 16 $\frac{1}{2}$ when simplified or as a mixed fraction. Example 4 Calculate 20 $\frac{4}{5}$. Solution Let us first change the whole number 20 to a fraction by making it $\frac{20}{1}$. Then, multiply it by the reciprocal of the fraction $\frac{4}{5}$, which is $\frac{5}{4}$. Thus, we have, $\frac{20}{1}$ $\frac{5}{4}$ Now that we must multiply two fractions, we will first multiply the numerators and then the denominators. $\frac{20}{1}$ $\frac{5}{4}$ = $\frac{100}{4}$ Therefore, 20 $\frac{4}{5}$ = $\frac{100}{4}$ or 25 when simplified. Example 5 Calculate 16 $\frac{9}{4}$. Solution Let us first change the whole number 16 to a fraction by making it $\frac{16}{1}$. Then, multiply it by the reciprocal of the fraction $\frac{9}{4}$, which is $\frac{4}{9}$. Thus, we have, $\frac{16}{1}$ $\frac{4}{9}$ Now that we must multiply two fractions, we will first multiply the numerators and then the denominators. $\frac{16}{1}$ $\frac{4}{9}$ = $\frac{64}{9}$ Therefore, 16 $\frac{9}{4}$ = $\frac{64}{9}$ or 7 $\frac{1}{9}$ when simplified or as a mixed fraction. Example 6 Solve 14 $\frac{3}{5}$. Solution Let us first change the whole number 14 to a fraction by making it $\frac{14}{1}$. Then, multiply it by the reciprocal of the fraction $\frac{3}{5}$, which is $\frac{5}{3}$. Hence, we have, $\frac{14}{1}$ $\frac{5}{3}$ Now that we must multiply two fractions, we will first multiply the numerators and then the denominators. $\frac{14}{1}$ $\frac{5}{3}$ = $\frac{70}{3}$ Thus, 14 $\frac{3}{5}$ = $\frac{70}{3}$ or 23 $\frac{1}{3}$ when simplified or as a mixed fraction. Example 1 Suppose a bottle of water holds 6 cups of water. How many cups are required to fill the bottle? Solution In this word problem, we must identify the number of cups of water to fill a bottle. Since a full bottle holds 6 cups, we must calculate 6. Since we are dividing a whole number by a fraction, we must multiply 6 by the reciprocal of , which is $\frac{2}{1}$. Here is the math, 6 $\frac{1}{2}$ = 6 $\frac{2}{1}$ = 12 Therefore, 12 of cups of water are required to fill the bottle. Example 2 A food bowl can hold 3 cups of food. A scoop is used to fill the food bowl. Suppose the scoop holds $\frac{1}{3}$ cups of food; how many scoops do you need to fill the food bowl? Solution In this word problem, we must identify the number of scoops to fill the food bowl. Since the scoop holds$\frac{1}{3}$ cups of food, we must calculate 3$\frac{1}{3}$. Since we are dividing a whole number by a fraction, we must multiply 3 by the reciprocal of $\frac{1}{3}$, which is $\frac{3}{1}$. Hence, we have, 3 $\frac{1}{3}$ = 3 $\frac{3}{1}$ = 9 Therefore, 9 of $\frac{1}{3}$ cups are needed to fill the food bowl. Example 3 Maria wants to divide 20 full chocolate bars among her students. When she divided the 20 chocolate bars by $\frac{2}{3}$, each student had an equal size of chocolate. How many students does she have? Solution In this word problem, we must identify how many students Mary has if she successfully divides 20 by $\frac{2}{3}$. Since we are dividing a whole number by a fraction, we must multiply 20 by the reciprocal of $\frac{2}{3}$, which is $\frac{2}{2}$. Hence, we have, 20 $\frac{2}{3}$ = 20 $\frac{3}{2}$ = $\frac{60}{2}$ =30 Therefore, Mary has 30 students. Example 4 Mr Davies has 5 pounds of nuts and wants to share them with his friends. Suppose each friend receives $\frac{1}{3}$ pounds; how many friends does he have? Solution In this problem, we must calculate the number of friends Mr Davies has. Since he has 5 pounds of nuts, we will divide 5 by $\frac{1}{3}$ or 5 $\frac{1}{3}$. To answer the division problem, we must multiply 5 by the reciprocal of $\frac{1}{3}$, which is $\frac{3}{1}$ or just 3. Hence, we have, 5 $\frac{1}{3}$ = 5 $\frac{3}{1}$ = $\frac{15}{1}$ = 15 Therefore, Mr Davies has 15 friends. When a whole number is divided by a fraction, the number of groups of the fraction that fit inside the whole is determined. The processes of dividing whole numbers by fractions are as follows: Step 1:Keep the same whole number.Step 2:Change the division symbol into the multiplication symbol.Step 3:Flip the fraction.Step 4:Multiply the whole number by the flipped fraction.Step 5:Simply, if necessary.Multiplying the Reciprocal of the Fraction Multiplying the reciprocal of the fraction is a common method for dividing a whole number by a fraction. When we say by the reciprocal of the fraction, it means that we switch the numbers placed in the numerator and the fractions denominator. Let us say, for example, we have $\frac{3}{5}$, and its reciprocal is $\frac{5}{3}$. Thus, in dividing a whole number by a fractional number, we must multiply the given whole number by the reciprocal of the given fraction. When a whole number is divided by a fraction, the number of groups of the fraction that fit inside the whole is determined. Let us say, for example, we want to calculate 12 $\frac{3}{4}$. Here, we want to identify how many $\frac{3}{4}$ fit the number 12. It can be solved by multiplying 12 by the reciprocal of $\frac{3}{4}$. 12 $\frac{3}{4}$ = 12 $\frac{4}{3}$ = $\frac{48}{3}$ = 16 This means there will be 16 equal groups when 12 is divided by $\frac{3}{4}$. As for another example, let us calculate 16 $\frac{2}{5}$. Here, we want to identify how many $\frac{2}{5}$ fit in the whole number 16. This can be solved by multiplying 16 by the reciprocal of $\frac{2}{5}$. 16 $\frac{2}{5}$ = 16 $\frac{5}{2}$ = $\frac{80}{2}$ = 40 This means there will be 40 equal groups when 16 is divided by $\frac{2}{5}$. When we say by the reciprocal of the fraction, it means that we switch the numbers placed in the numerator and the fractions denominator. Let us say, for example, we have $\frac{2}{5}$, and its reciprocal is $\frac{5}{2}$. As for $\frac{2}{3}$, $\frac{3}{8}$ and $\frac{6}{11}$, their reciprocals are $\frac{3}{2}$, $\frac{8}{3}$ and $\frac{11}{6}$, respectively. The processes of dividing whole numbers by fractions are as follows: Step 1:Keep the same whole number.Step 2:Change the division symbol into the multiplication symbol.Step 3:Flip the fraction.Step 4:Multiply the whole number by the flipped fraction.Step 5:Simply, if necessary. Let us say, for example, we want to calculate 12 $\frac{5}{7}$. Let us follow the steps of dividing whole numbers by fractions. Step 1:We will keep the same whole number, 12.Step 2:Change the division symbol into the multiplication symbol.Step 3:Flip the fraction.Since the given fraction is $\frac{5}{7}$, it becomes $\frac{7}{5}$.Step 4:Multiply the whole number by the flipped fraction.Multiply 12 by 7, then divide the answer by 5.12 $\frac{7}{5}$ = $\frac{84}{5}$Step 5:Simply, if necessary. $\frac{84}{5}$ is equal to 16$\frac{4}{5}$ when simplified or as a mixed fraction. As for another example, let us calculate 9 $\frac{3}{5}$. Let us follow the steps of dividing whole numbers by fractions. Step 1:We will keep the same whole number, 9.Step 2:Change the division symbol into the multiplication symbol.Step 3:Flip the fraction.Since the given fraction is $\frac{3}{5}$, it becomes $\frac{5}{3}$.Step 4:Multiply the whole number by the flipped fraction.Multiply 9 by 5, then divide the answer by 3.9 $\frac{5}{3}$ = $\frac{45}{3}$Step 5:Simply, if necessary.$\frac{45}{3}$ is equal to 15 when simplified. When dividing fractions, the easiest way to follow is to multiply the reciprocal of the divisor by the dividend. Remember that in a division statement, we have dividend divisor = quotient. So, let us say we have $\frac{2}{3}$ $\frac{1}{5}$, $\frac{2}{3}$ is the dividend and $\frac{1}{5}$ is the divisor. To find the quotient, we must multiply $\frac{2}{3}$ by the reciprocal of $\frac{1}{5}$. Hence, to calculate this, we have, $\frac{2}{3}$ x $\frac{5}{1}$ = $\frac{10}{3}$ = 3$\frac{1}{3}$ Therefore, the quotient is $\frac{10}{3}$ or 3$\frac{1}{3}$ in mixed fractions. As for another example, let us calculate $\frac{5}{7}$ $\frac{3}{4}$. To find the quotient, let us multiply $\frac{5}{7}$ by the reciprocal of $\frac{3}{4}$. Thus, we have, $\frac{5}{7}$ x $\frac{4}{3}$ = $\frac{20}{21}$ Therefore, $\frac{5}{7}$ $\frac{3}{4}$ = $\frac{20}{21}$ Reducing a fraction to its simplest form is the definition of simplifying a fraction. If a fractions numerator and denominator are coprime or share only the number one as a common factor, it is said to be in its simplest form. The given fraction is equal toits simplest form. Let us say, for example, we want to simplify the fraction $\frac{6}{24}$. Let us first list all the factors of the numerator, 6, and the denominator, 24, of the given fraction. Factors of the numerator, 6: {1, 2, 3, and 6}Factors of the denominator, 24: { 1, 2, 4, 3, 6, 8, 12, and 24} The common factors of the numerator, 6, and the denominator, 24, are 2, 3, and 6. We could divide the numerator and the denominator of the fraction $\frac{6}{24}$ by 2, 3, and 6. $\frac{62}{242}$ = $\frac{3}{12}$ 3/12 is still not in its simplest form since they still have common factors. $\frac{33}{123}$ = $\frac{1}{4}$. We could also divide the numerator and the denominator by 3. $\frac{63}{243}$ = $\frac{2}{8}$ $\frac{22}{82}$ = $\frac{1}{4}$. If we try dividing both the numerator and the denominator by 6, we have. $\frac{66}{246}$ = $\frac{1}{4}$. It is important to note that the easiest way to simplify a given fraction is to divide both its numerator and denominator by their greatest or highest common factor. Fractions (Mothers Day Themed) Math WorksheetsWhole Numbers (Rio Carnival Themed) Math WorksheetsRounding Whole Numbers (Thousands and Ten Thousands) (International Womens Day Themed) Math Worksheets Link/Reference Us We spend a lot of time researching and compiling the information on this site. 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