Decimal / Money Tips

1. Multiplying Decimals:

Step1: Multiply the numbers as usual (with the larger # on top). Keep the decimals in the problem, but ignore them until you have your final product.
Step 2: Now count how many numbers are behind the decimals in your 2 factors.
Step 3: Starting at the END (right hand side) of your product, count forward (to the left) the same number of places as you have numbers behind the decimal. This is where your decimal goes.

Ex. 2.34 *There are 3 numbers behind the decimals in this problem (red).
x 1.3
3042 *So count 3 places to the left and place your decimal.
So 3042 becomes 3.042 after you count 3 numbers from the end.
Answer: 3.042

Ex. 4.5
x 1.32
5.940

2. Dividing a decimal by a whole number:

Step 1: Simply set the problem up with the decimal number in the "dog house."
Step 2: While dividing, when you get to the decimal place in the dividend, move it directly up into the quotient.
Step 3: Finish the problem.

Ex. $3\overline{)9.9}$ $\quad\quad 3.3$ *The decimal in the quotient (answer) will be directly above the dividend (the number in the "dog house")

Ex. $4\overline{)0.16}$ $\quad\quad 0.04$

3. Dividing a decimal by a decimal:
Step 1: Never begin a division problem if the divisor is a decimal. You must change it to a whole number before you can continue. Always move the decimal in the divisor to the right until it becomes a whole number. (The number outside the box)
Step 2: To be "fair" what ever you do to the divisor you must also do to the dividend. So find the decimal in the dividend and move that one the SAME number of places to the right as well. (*If it is a whole number, the decimal is at the END, not the beginning of the number)
*Step 2 is the easiest one to forget.

Ex. $0.3\overline{)9.9} \rightarrow 3\overline{)99}$ *You moved the decimal place 1 time to make 0.3 a whole number, so you move it only 1 time to make 9.9 become 99.

* The dividend will not always become a whole number.

Ex. $0.4\overline{)0.16} \rightarrow 4\overline{)01.6}$

*The dividend will not always have an obvious decimal place.

Ex. $0.02\overline{)4} \rightarrow 2\overline{)400}$ *You had to move the decimal place 2x's to make 0.02 a whole number so you moved the decimal place behind the whole number 4 to make it 400.

4. Dividing Money by Money:
Step 1: Follow all the same rules as you do for Dividing Decimals by Decimals.
Step 2: Your final answer will NOT have a $ or ¢ in it when you are dividing money by money.

Ex. $\$0.25\overline{)\$6.50} \rightarrow \$25\overline{)\$650}$ *In other words, twenty-five cents goes into six dollars and fifty cents twenty-six times. No need for the $ in the quotient.

Ex. $\$0.03\overline{)\$0.66} \rightarrow \$3\overline{)\$66}$

5. Dividing Money by Whole Numbers:
Step 1: Follow the same rules as you do for Dividing Decimals by Whole Numbers.
Step 2: The final answer needs to have the correct money sign: ¢, $

Ex. $3\overline{)\$24.00}$ $\$8.00$

Ex. $8\overline{)\$2.40}$ $\$0.30$

6. Subtracting Decimals with Uneven decimal places:
Step 1: Always line up the decimals.
Step 2: If there are ANY uneven decimal places in either of the two numbers, add enough zeros to make them even. *You may only do this AFTER the decimal.

Ex. 2.4 – 1.23 =? → 2.4 → 2.40
-1.23 -1.23
1.17

Ex. 1 – 0.004 = ? → 1 → 1.000
-0.004 -0.004
0.996

*** This same tip can be applied to money**

7. Rounding Money to the Nearest Cent:
Step 1: There are 100 cents in 1 dollar, each worth 1 penny. So when asked to round to the nearest "cent" you are being asked to round to the one hundredths' place. (2 decimal places).
Step 2: ALWAYS when rounding, pick the place that you are going to be rounding TO and then look 1 place to the right of that. If the number is less than 5, the number stays the same. If the number is 5 or greater, round the previous number up one time.

Ex. Round to the nearest cent: $0.3409999999999999
Since we are rounding to the place that the '4' is currently holding, look one place to the right and there is a '0'. EVEN THOUGH there are many # '9's,' the '0' is the one that tells the '4' whether or not to round up one. In this case the '4' stays and all other numbers are now dropped.
Answer: $0.34

Adding and subtracting time

Often kids do this on their fingers, so when they are required to write answers down on paper they struggle.

Step 1: All math must be done with matching units, AM and PM are units. Therefore we must do the following.

Step 2: Always arrange operation finishing time minus starting time.

Step 3: If the units are different always (except for pm/noon) add 12 to the finishing time and subtract the starting time from it. (Finishing time is not always the bigger number)

Ex. Jack started reading a book at 9am and finished reading at 3pm. How long did it take him?

In this problem the finishing time is 3pm and the starting time is 9am, so we must do the math 3pm - 9am. Notice the units are different. Therefore, add 12hours to 3pm (the later time). This becomes 15am. Now you can subtract because now the smaller number is the starting time. So 15am - 9am = 6hrs

Ex. Hannah's family went on a long trip and drove from 11pm to 6am. How long was their drive?

So we subtract the starting time from the finishing time. Starting time = 11pm. Finishing time = 6am. So we add 12hours to the finishing time.

6am + 12hrs = 18pm.

18pm-11pm =7hrs

***If units are the same:**

Finishing

-Starting

Difference

***If units are different: (except 12noon)**

Finishing + 12

-Starting

Difference

Subtracting Time when minutes do not match

Sometimes when doing the above type of math you will have to subtract a very specific starting time from a very specific ending time, like 3:32pm - 2:51pm. In this case we need to remember how to borrow time.

Step 1: Set up the problem just like a regular time problem following the same rules as you learned above, adding 12 hours to the finishing time, if necessary.

Finishing

-Starting

Difference

3:32pm

-2:51pm

Difference

Step 2: Subtract the ones place in the minutes.

2 - 1 = 1

Step 3: Subtract the 10's place in the minutes.

3 - 5 = ...

This doesn't work so you must borrow from the hours place. Remember, 1 hour = 60 minutes

Step 3: Take 1hr from the hours place leaving a 2, and add 60 to the minutes place. Hint: the easy way is to just add 6 to the digit in the 10's place. In this case make the 3 a 9, and then you can subtract.

So 3:32 becomes 2:92pm

2:**9**2 pm

-2:51pm

0:41minutes

Now, let's use both skills together.

Ex. If Rachel went to soccer camp and started practice at 9:49am, her team finished at 3:14pm. How long did she play?

In this case units are different:

Finishing + 12

-Starting

Difference

Step 1: Add 12 hours to the finishing time.

3:14pm + 12 = 15:14 am

Step 2: Subtract, borrowing 1 hour from the 15 hours, adding 60 minutes to the 14 minutes in the finishing time, and then subtracting the minutes using normal borrowing (borrowing a 10 not 60) Borrowing minutes will make the 7 in 74 a 6, and will make the 4 in 74 a 14. Thus 14 - 9 = 5, 6 - 4 = 4, and 14 - 9 = 5. Leaving 5:25, or 5 hrs and 25 minutes.

15:14 becomes 14:74 14:74am

- 9:49am

5:25 hours of soccer camp

Money recognition

There are 5 skills that children must be able to master to deal with money.

1. We have to know the names of the numbers, in the correct order.
2. We have to be able to count objects accurately.
3. We have to understand the connection between digits (symbols) and the value they represent.
4. We have to understand the concepts of addition (grouping things together) and subtraction (splitting things apart).
5. We have to understand that objects can have a value, which is irrespective of their color, shape, size, mass, etc.

Reference: Bond, Marion. "Money Problems?" www.nrich.maths.org. Apr. 8, 2007.

Research has shown that kids without "real world" experience struggle with number 3.

Reference: (*Martin Hughes (Children and number. Difficulties in Learning Mathematics Oxford: Basil Blackwell (1987))*

For example, there is nothing visually representative on a nickel, other than the word five, that shows that the nickel is equivalent to 5 pennies. So working with a child on equivalent values is a first key step.

Recommendations:

1. Give your kids real life experience seeing you handle cash and coins, as well as buying and selling with money themselves.
2. Create an equivalent currency around the house by drawing on construction paper dots to represent the number of pennies and naming the cards with the appropriate names.
3. Kids can turn in cards to receive their change if the want to get something at the store.
4. Use the terminology "coin" and "change" with your kids. We forget that it is a fairly abstract concept.

