Addition Math Fact Progression Using Strategies

Materials: One package of addition math fact cards. Be sure to have your child explain the strategy they used as well as give you the answer. While we do want them to be relatively speedy with their answers, our focus is on using strategies so that we can build their number sense. We don't want to send the message that you have to be fast at math to be good at math. The more we work on strategies, not only will their flexible thinking improve, but their speed and accuracy as well.

Special notes:

. Only introduce the math facts of the current strategy you are working on and then any previous strategies your

child has mastered. This allows your child to develop confidence and continually build on what he or she knows. The Commutative Property ("turnaround principle") helps us because we can change the order of the numbers (known as addends) and know that the answer (known as the sum) will be the same, so we want to be sure to include these at every step along the way. Progress to the next strategy when you feel like your child has a good sense of the facts in the strategy. We want students to have relative speed, accuracy, efficiency, and flexibility of thought by using strategies. When given a math fact, it is possible many strategies can be used to figure out the answer - just because I have listed them under one strategy does not mean that your child should only solve it using that strategy - he/she

should use the one that helps them determine the sum in the most efficient way for them. Addo any number plus O equals the number we started with

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

0 + 1, 0 + 2,0 +3,0 + 4,0 + 5,0 +6,0 + 7,0 + 8,0 + 9,0 + 10 Add 1 any number plus 1 equals the next counting number

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

1 +0,1 + 2,1 +3,1 +4,1 +5,1 +6,1 +7,1 + 8,1 + 9,1 + 10 Count on 2 or 3 within 5

whenever we are adding 2 or 3 to another number; we have already learned some, so

here are the additional ones 2 + 2, 3 + 2, 2 + 3

Combination that make 5 there are no cards for this because they have already been covered in the previous strategies, but we do want to make sure they know these with automaticity 0+5, 1+4,2+3, 3+ 2,4 + 1, 5+ 0 Count on 2 or 3 within 10 when working on these facts, have students pay attention to the fact that it is more efficient if we start with the larger number and then count on even when it appears second

4 + 2,5+2, 6+ 2, 7+2,8 + 2, 3 + 3, 4 + 3,5 +3,6 +3,7 + 3

2 +4,2 +5,2 +6,2 + 7, 2+8, 3+ 4, 3+5,3 +6, 3+7

Pairs that make 10 knowing these combinations is a VITAL skill your child needs to support more advanced math strategies and concepts (you can play Go Fish but instead of making pairs, make pairs that add to 10) Already covered - 10 + 0,9 + 1,8 + 2,7 +3,3 +7,2 + 8,1 +9,0 + 10 Additional facts: 6 + 4,5+5,4 + 6

anneliserecord.com

A
nn Elise Record
CONSULTING LLC

Add 10 teen numbers are composed of a ten and a collection of ones; encourage your child to notice the pattern that the number added to 10 ends up in the ones place

10+ 4, 10 + 5, 10 + 6, 10 + 7, 10 + 8, 10 + 9,4 + 10,5 + 10,6 + 10,7 + 10, 8 + 10, 9 + 10

Doubles knowing these facts helps with more that are coming up; have them hold up fingers for one addend and you hold up the same number of fingers - as shown in the picture, notice how the 2-5's make 10 and then the two 2's are 4, so 7 + 7 is renamed as 10 + 4

4+4, 6 + 6, 7 + 7,8 + 8, 9 + 9, 10 + 10

Doubles Plus 1 or Minus 1 when we add two numbers that are one apart, we can use doubles to help us make it simpler (for example, when adding 7 + 8, encourage your child to think that since 7 + 7 = 14, then we know that 7 + 8 must be one more, so 7 + 8 = 15; they can also think of it as 8 + 8 = 16, so 8 + 7 is one less than that and 8 + 7 must be 15)

4 +5,5+6, 6+7,7 +8,5+4, 6 + 5, 7 + 6,8 + 7

Doubles Plus 2 or Minus 2, or Monkey in the Middle (you can double the middle number) when we add two numbers that are two apart, we can use doubles to help us make it simpler (for example, when adding 6 + 8, encourage your child to think that since 6 + 6 = 12, then we know that 6 + 8 must be two more, So 6 + 8 = 14; they can also think of it as 8 + 8 = 16, so 8 + 6 is two less than that and 8 + 6 must be 14); one last way is to give one from the larger to the smaller one and rename it as a doubles fact of the number in the middle, so 5 + 7 is renamed to 6 + 6

3+5,5 + 3, 4 + 6, 6+4, 7 +5,5 + 7,8 +6,6 +8,7 +9,9 + 7

Bridge 10 with a 9 take one from the number you are adding to make a 10 with the 9 and then add the rest to the 10 (for example, 9 + 5 is the same as 9 +1 +4 10 + 4 = 14 is easier to deal with in our brain)

9 +4,9 + 5,9 +6,9 +7,9+8, 9 + 10,4 +9,5+9,6 +9, 7+9,8 + 9, 10 +9

Bridge 10 with 7 or 8 take 2 or 3 from the other number to make a 10 with the 7 or 8 and then add the rest to the 10 (for example, 8 + 5 = 8 + 2+ 3 (break apart the 5 into 2 + 3) = 10 + 3 = 13

4 + 8,5 + 8,4 + 7, 8 + 4,8 + 5, 7 +4

Subtraction Math Fact Progression Using Strategies

Materials: One package of subtraction math fact cards. Be sure to have your child explain the strategy they used as well as give you the answer. While we do want them to be relatively speedy with their answers, our focus is on using strategies so that we can build their number sense. We don't want to send the message that you have to be fast at math to be good at math. The more we work on strategies, not only will their flexible thinking improve, but their speed and accuracy as well.

Special notes:

Only introduce the math facts of the current strategy you are working on and then any previous strategies your child has mastered. This allows your child to develop confidence and continually build on what he or she knows.

Progress to the next strategy when you feel like your child has a good sense of the facts in the strategy. *We* want students to have relative speed, accuracy, efficiency, and flexibility of thought by using strategies.

When given a math fact, it is possible many strategies can be used to figure out the answer - just because I have listed them under one strategy does not mean that your child should only solve it using that strategy - he/she should use the one that helps them get to the answer the fastest Subtract o any number minus 0 equals the number we started with

0 – 0,1 - 0,2 - 0,3 - 0,4 - 0,5 - 0,6 - 0,7 - 0,8 - 0,9 - 0,10 - 0

Subtract 1

any number minus 1 equals the previous counting number

1 – 1, 2 – 1, 3 - 1,4 - 1,5 - 1,6 - 1, 7 – 1, 8 – 1,9 -1, 10 - 1

Subtract the number from itself whenever we are subtracting the same number, we are left with o

2 – 2, 3 - 3, 4 - 4, 5 - 5, 6 - 6, 7 - 7, 8 - 8, 9 - 9, 10 - 10

Subtract
5 some of these have already been learned, here are the remaining

3 - 2, 4 - 2, 4 - 3, 5 – 2, 5 - 3, 5 - 4

Subtract within 10 students can count back the number, they could count back until they get to the other number, they could count UP from the lower number, or they can use their knowledge of addition facts to help them (if they know that 6 + 2 = 8 then 8 - 6 must be 2 and also 8 - 2 must be 6)

6 - 2, 6 - 3, 6 - 4, 6 - 5, 7 - 2, 7 - 3, 7 - 4, 7 - 5, 7 - 6, 8 - 2, 8 - 3, 8 - 4, 8 - 5
8 - 6, 8 - 7, 9 - 2, 9 - 3, 9 – 4, 9 - 5, 9 - 6, 9 - 7, 9 - 8

Subtract from 10 knowing these combinations is a HUGE skill your child needs to support more advanced math concepts - if they know the pairs of numbers that add to 10, they will know the difference when they see the other number taken away from 10

10 - 2, 10 – 3, 10 - 4, 10 - 5, 10 – 6, 10 – 7, 10 - 8, 10 - 9

Subtract 10 using the understanding that every number in the teens is composed of a 10 and some ones will help students understand why, when we take away the ten, we end up with the ones

11 - 10, 12 - 10, 13 - 10, 14 – 10, 15 – 10, 16 - 10, 17 – 10, 18 – 10, 19 - 10

Subtract ones from a teen building on the previous strategy, when we take away the ones from a teen number, we are left with the ten

11 - 1, 12 - 2, 13 - 3, 14 – 4, 15 - 5, 16 - 6, 17 - 7, 18 - 8, 19 - 9

Subtract half facts use doubles facts to help recognize a half fact

12-6, 14 - 7, 16-8, 18-9,20 - 10

as

a

using a 10 to help us figure out a difference is a foundational skill for more advanced calculations with larger numbers and even fractions and decimals... students can either think about counting down using the 10 or counting up from the lower number using the ten

11 – 2, 11 – 3, 11-4, 11-5, 11-6, 11 - 7,11 -8,
11-9,

12-3, 12-4, 12-5, 12-7, 12-8, 12-9 13-4,
13 - 5, 13-6, 13 - 7,13-8, 13-9

14 - 5, 14 - 6, 14-8,
14-9 15 -6, 15-7,
15-8, 15-9

16-7, 16-9
17-8,
17-9

We want our students to develop flexibility in their thinking with subtraction because different subtraction strategies can be used depending on the numbers we are given.

Students can think of subtraction as taking away but we can use 10 as a bridge.

12-4 = ?

12 take away 2 gets us to 10 and then take away 2 more lands us on 8. So, 12 - 4 = 8.

Students can also think about subtraction as the distance between two numbers. We can even

think additively to determine that distance.

15 - 9 = ? Starting at 9, it takes 1 more to get to 10 and then 5 more to get to 15, so 15 - 9 = 6.

anneliserecord.com

Ann Elise Record
CONSULTING LLC

Multiplication Math Fact Progression Using Strategies

Materials: One package of multiplication math fact cards. Be sure to have your child explain the strategy they used as well as give you the answer. While we do want them to be relatively speedy with their answers, our focus is on using strategies so that we can build their number sense. We don't want to send the message that you have to be fast at math to be *g*ood at math. The more we work on strategies, not only will their flexible thinking improve, but their speed and accuracy as well.

Special notes:

- Only introduce the math facts of the current strategy you are working on and then any previous strategies your child has mastered. This allows your child to develop confidence and continually build on what he or she knows. The Commutative Property ("turnaround principle") helps us because we can change the order of the numbers (known as factors) and know that the answer (known as the product) will be the same, so we want to be sure to include these at every step along the way. Progress to the next strategy when you feel like your child has a good sense of the facts in the strategy. We want students to have relative speed, accuracy, efficiency, and flexibility of thought by using strategies. When given a math fact, it is possible many strategies can be used to figure out the answer - just because I have listed them under one strategy does not mean that your child should only solve it using that strategy - he/she should use the one that helps them determine the sum in the most efficient way for them. Mult by any number times 0 is equal to 0

o x 0, 0 x 1,0x2,0x3,0 x 4,0 x 5,0x 6,0 x 7,0x8,0x9,0 x 10

1x0,2 x 0,3 x 0,4 x 0,5 x 0,6X0,7 x 0,8x0,9 x 0, 10 x 0

Mult by 1 any number times 1 is equal to the same number

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

1x 2,1 x 3,1 x 4,1 x 5,1 x 6,1 x 7,1 x 8,1 x 9, 1 x 10 Mult b

15 count forward to backward by 5's by a math fact you know for sure; multiply by 10 and half it; use 5 x 5 = 25 as a benchmark to be more efficient

5x5, 3 x 5, 4 x 5, 6 x 5, 7 x 5,8 x 5, 9 x 5, 10 x 5

5x3,5 x 4,5 x6,5 x 7,5 x 8,5 x 9,5 x 10 Mult by 10 any number times 10 equals the number we started with a 0 in the ones place since our number system is based on the fact that place value positions are worth ten times the position to the right; students should spend time noticing the patterns that occur when multiplying by 10 (**special note***the digits shift place value positions - we don't just "add a 0")

10 x 10, 10 x 2,10 x 3,10 x 4,10 x 5, 10 x 6,10 x 7, 10 x 8, 10 x 9

2 x 10,3 x 10,4 x 10,5 x 10,6 x 10,7 x 10,8 x 10,9 x 10

Mult by 2 - Doubles we can also think of these as the number added to itself which has already been learned in the addition math facts

2 x 2,2 x 3,2 x 4,2 x 5,2 x 6,2 x 7,2 x 8,2 x9

3x2,4x2,5 x 2,6 x 2,7 x 2,8 x 2,9x2

Ann Elise Record
CONSULTINCLI.

Mult by 4 - Double Doubles you can think of any number times 4 as being equal to that number times 2 and then doubled (for example 8

x 4 = (8 x2) x 2 = 16 x 2 = 32)

4 x 4,3 x 4,6 x 4,7 x 4,8 x 4,9 x 4

4 x3,4x6, *4 x 7,4*x8, 4x9

Mult by 8 - Double Times Four or Double Double Double we can think of any number times 8 as being equal to that number times 4 and then doubled OR times 2 and then times 2 and then times 2 one last time (for example, 6 x 8 = 6 x 4 x 2 = 24 x 2 = 48 or even down to 6x2x2 x 2 = 12 x 2 x 2 = 24 x 2 = 48)

8x8,3 x 8,6 x 8,7 x 8, 9 x 8

8x3,8 x 6,8 x 7,8 x 9

8X6
Double x4
Dbl Dbl Dbl

Mult by 3 we can think of any number times 3 as being one more group than doubles (for example, 6 x 3 = (6 x 2) + 6 = 12 + 6 = 18 this way of thinking helps support the understanding that multiplication is all about groups of equal sizes being combined)

3x3,3 x 6,3 x 7,3 x9

6x3,7 x 3,9 x 3 Mult by 6 - Double Times 3 we can think of any number times 6 as being equal to that number times 3 doubled (for example 7 x 6 = 7 x 3 x 2 = 21 x 2 = 42)

6 x 6,6 x 7, 6x9

7 x 6,9 x 6 **Hteese**

6x6
Dbl x3

Triple x2

5x + 1grp

Mult by *9* we can think of any number times 9 as that number times 10 and then take one group away (for example, 7 x 9 = (7 x 10) - 7 = 70 - 7 = 63)

9 x 9,7 X9

9x7

Mult by *7* when multiplying by 7 you can always break apart the 7 into 5 groups and 2 groups and multiply each by the other factor since students are usually solid with their 5's and 2's

7*x*7

5*x*7 = 5 x 5 + 5 x 2

Division Math Fact Progression Using Strategies

Materials: One package of division math fact cards. Be sure to have your child explain the strategy they used as well as give you the answer. While we do want them to be relatively speedy with their answers, our focus is on using strategies so that we can build their number sense. We don't want to send the message that you have to be fast at math to be good at math. The more we work on strategies, not only will their flexible thinking improve, but their speed and accuracy as well.

Special notes:

Only introduce the math facts of the current strategy you are working on and then any previous strategies your child has mastered. This allows your child to develop confidence and continually build on what he or she knows.

Progress to the next strategy when you feel like your child has a good sense of the facts in the strategy. *We* want students to have relative speed, accuracy, efficiency, and flexibility of thought by using strategies.

When given a math fact, it is possible many strategies can be used to figure out the answer - just because I have listed them under one strategy does not mean that your child should only solve it using that strategy - he/she should use the one that helps them get to the answer the fastest

Divide O by any number O divided by any number is equal to 0.

0 – 1, 0 – 2, 0-3, 0-4, 0-5, 0-6, 0 7, 0 = 8, 0-9, 0 = 10

Divide

Any number divided by 1 is equal to the same number.

1 + 1, 2 = 1, 3 = 1, 4 = 1, 5 = 1, 6 = 1, 7-1, 8 = 1, 9 = 1, 10 = 1

Divide by Self Any number divided by itself will be equal to 1.

2= 2, 33, 44, 5:5, 6:6, 7:7, 8=8, 99, 10 = 10

Divide by 2 *We* want to relate the more familiar doubles facts to the half facts

4 – 2, 6 – 2, 8=2, 10 = 2, 12-2, 14 = 2, 16:2, 18 + 2, 20 + 2

Divide by its half We again want to relate the more familiar doubles facts to help with the related half facts.

6+3, 8 = 4, 10 = 5, 12 = 6, 14 = 7, 16 + 8,

18:9, 20 = 10

Divide by 5 Many students are familiar with skip counting by 5's but we want to work on efficiency by encouraging them to use any multiples of 5's that they know from memory or the benchmark math fact of 25 - 5 to determine any quotients they don't know. For example, when asked 35 - 5, if students know 6 x 5 = 30 then one more group of 5 fits into 35 so 35 = 5 must be 7.

15 = 5, 20 - 5,25 = 5, 30 = 5,35 = 5,40 = 5,45 = 5,50 5

anneliserecord.com

Ann Elise Record
CONSULTING ELC

Divide by 10 One of the most important math concepts in elementary school is place value. We wants understand that every place value position to the left is 10 times the one to its right and 1/10th of the one to its left. Please avoid using tricks such as "drop the zero" since that will not work when we work with decimals down the road. When we divide by 10, the tens place digit shifts one position to its right. We can also relate these facts to the more familiar multiply by 10 facts.

30 - 10,40 - 10,50 - 10,60 = 10,70 = 10, 80 = 10,90 = 10, 100 = 10

Divide by 3 If students don't know the related multiplication math fact, we want to encourage them to use any multiplication math facts of 3 they know from memory to determine any quotients they don't know. For example, when given 18 = 3, if students don't know that 3 x 6 = 18, but they do know that 5 x 3 = 18, they can determine that one more group of 3 can fit into 18 and so 18: 3 must be 6.

9=3, 123, 15 = 3,18 3,21 = 3,24 = 3,27 = 3,30 : 3

Divide by 6 If students don't know the related multiply by 6 math fact, we can use the fact that 2 and 3 are factors of 6 to help us. *We* can first divide the dividend by 2 and then divide the resulting quotient by 3. We could also first divide by 3 and then by 2.

18 = 6, 24 = 6,30 = 6,36 = 6,42 = 6,48 = 6,54= 6,60 = 6

Divic 4 If students don't know the related multiply by 4 math fact, we can use the x4 Double Double multiplication strategy to help us. We can divide the dividend in half and then in half again.

12 = 4, 16 = 4,20 = 4,24 = 4,28 = 4, 32 = 4,36 = 4,40 : 4

Divic

18 If students don't know the related multiply by 8 math fact, we can use the x8 Double Double Double multiplication strategy to help us. We can divide the dividend in half, in half again, and then in half again.

24 = 8,32 = 8,40 = 8,48 = 8,56 = 8,64 - 8,72 = 8,80 = 8

Divide by 9 If students don't know the related multiplication math fact, we want to encourage them to use any multiplication math facts of 9 they know from memory to determine any quotients they don't know. For example, when given 54 = 9, if students don't know that 6 x 9 = 54， but they do know that 5 x 9 = 45, they can determine that one more group of 9 can fit into 54 and so 54 - 9 must be 6.

27= 9,36 = 9,45 - 9,54= 9,63-9, 72 - 9,81 - 9,90 = 9