Math Myths and Misconceptions

A Series on Preventing and Repairing Student Misconceptions in Mathematics

Preventing Misconceptions

Session 4b

Strategies for Learning the Basic Addition Facts

Basic Addition Facts

There are strategies for learning the "basic facts" which will develop a child's conceptual understanding of addition.

Basic Addition Facts

One could memorize all the basic facts by rote, but pattern-based and number sense strategies build a stronger foundation for higher level mathematics.

Basic Addition Facts

When using pattern-based and number sense strategies, we don't necessarily "march through" the basic facts in numerical order.

Basic Addition Facts

Rather, we build on foundational prerequisite skills and develop "hooks" on which children are able to hang their understandings.

(see Module 4a)

Basic Addition Facts

Let's begin!

Basic Addition Facts

Start with adding 1, 2, and doubles

Adding 1: 3+1 5+1 9+1

Adding 2: 4+2 7+2 8+2

Doubles: 3+3 4+4 6+6

Basic Addition Facts

Start with adding 1, 2, and doubles

These three facts groups have already been learned visually, orally, and aurally through adding 1 more, 2 more, and doubling numbers from 0 to 9

(see Module 4a)

Basic Addition Facts

Adding 0 (zero)

This is the additive identity property.

In the additive identity property, the sum of the number and zero yields the same number.

Basic Addition Facts

So far we've worked on these 58 addition facts just through the **prerequisite skills**:

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

Basic Addition Facts

Adding 9

Say one less than the other addend and "teen"

This strategy is based on the prerequisite learning of taking one less from any number.

(see Module 4a)

Basic Addition Facts

Adding 9

Say one less than the other addend and "teen"

9 + 7 = 6 "teen"

5 + 9 = 4 "teen"

Basic Addition Facts

Including the **9's**, we've now worked through these addition facts:

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

Basic Addition Facts

Adding 8

Say two less than the other addend and "teen"

This strategy is based on the prerequisite learning of taking two less from any number.

(see Module 4a)

Basic Addition Facts

Adding 8

Say two less than the other addend and "teen"

8 + 7 = 5 "teen"*

5 + 8 = 3 "teen"*

Basic Addition Facts

Including the **8's**, we've now worked through these addition facts:

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

Basic Addition Facts

Uphill / Downhill Neighbors

Double one addend then add one more or take one less

This strategy is based on the prerequisite learning of doubling a number and taking one more or one less from a number.

(see Module 4a)

Basic Addition Facts

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

As shown here, **3 + 4** can be though of as:

3 doubled plus 1 (if we take the "downhill" neighbor: 3)

or, **4** doubled minus 1 (if we take the "uphill" neighbor: 4)

Basic Addition Facts

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

The other neighbors,

4 and **5**

5 and **6**

6 and **7**

can be solved using the same strategy

Basic Addition Facts

We've now dealt with most of the addition facts:

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

21

Basic Addition Facts

The Final 6

5+3   6+3   6+4   7+3   7+4   7+5

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

Basic Addition Facts

The Final 6

5+3   6+3   6+4   7+3   7+4   7+5

Chose one fact to memorize to "unlock" the other five

Basic Addition Facts

The Final 6

5+3   6+3   (6+4)   7+3   7+4   7+5

Chose one fact to memorize to "unlock" the other five, for example:

6 + 4 = 10

Basic Addition Facts
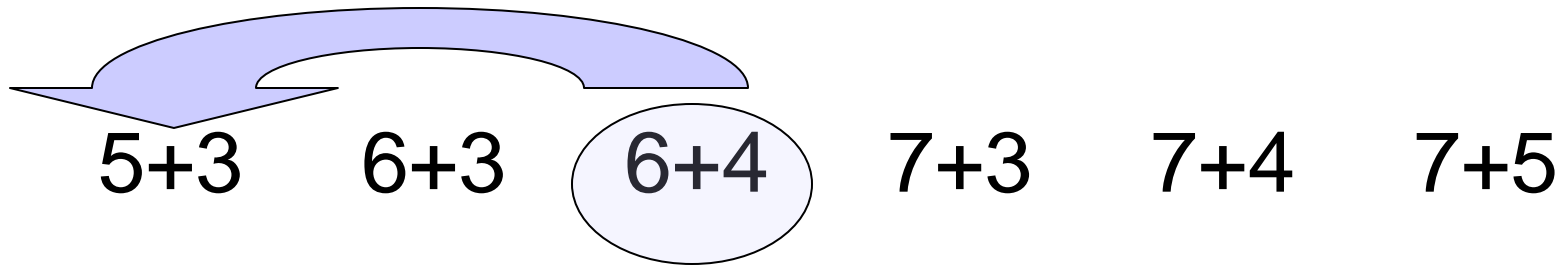
The Final 6

5+3   6+3   6+4   7+3   7+4   7+5

6 + 4 = 10

6 + 3 = 10 − 1

3 is one less than 4

Basic Addition Facts

The Final 6

5+3   6+3   6+4   7+3   7+4   7+5

6 + 4 = 10

5 + 3 = 10 − 2

5 is one less than 6

3 is one less than 4

Basic Addition Facts

The Final 6

5+3   6+3   6+4   7+3   7+4   7+5

6 + 4 = 10

7 + 3 = 10

7 is one more than 6

3 is one less than 4

No change—just like adding 0

Basic Addition Facts

The Final 6

5+3   6+3   6+4   7+3   7+4   7+5

6 + 4 = 10

7 + 4 = 10 + 1

7 is one more than 6

Basic Addition Facts

The Final 6

5+3   6+3   6+4   7+3   7+4   7+5

6 + 4 = 10

7 + 5 = 10 + 2

7 is one more than 6

5 is one more than 4

Basic Addition Facts

We've now dealt with all the addition facts:

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

30