



Parent Council Meeting

OCTOBER 26, 2020

Numeracy – Strategies to build Automaticity of Facts

Reasoning Strategies for Addition Facts

- One More Than and Two More Than
- Adding Zero
- Doubles
- Near-Doubles (e.g., $5 + 4$ is one away from 10)
- Using 5 as an Anchor
- Combinations of 10 and Making 10
- Adding On
- Compensation
- Moving

Numeracy – Strategies to build Automaticity of Facts

Addition Strategies (cont.)

Combinations of 10 & Making 10

“Perhaps the most important strategy for students to know is the combinations that equal 10.”

$$\begin{aligned}6 + 7 &= 6 + 4 + 3 \\ &= 10 + 3 \\ &= 13\end{aligned}$$

$$\begin{aligned}60 + 70 &= 60 + 40 + 30 \\ &= 100 + 30 \\ &= 130\end{aligned}$$

These combinations inform all of the additive work students do above and beyond 10.

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Addition Strategies (cont.)

Adding On

The number being added is decomposed into parts. Each part is added separately.

$$42 + 37$$

$$42 + 30 = 72$$

$$72 + 7 = 79$$

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Addition Strategies (cont.)

Compensation

This strategy involves adding more than is required and then subtracting the additional amount.

$$36 + 57$$

$$36 + 60 = 96 \text{ (add 3 to 57)}$$

$$96 - 3 = 93 \text{ (subtract the extra 3)}$$

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Addition Strategies (cont.)

Moving

We can move a quantity from one addend to another to create an expression with friendly numbers.

$$52 + 48$$

$$50 + 50 \text{ (move 2 from 52 to 48)}$$


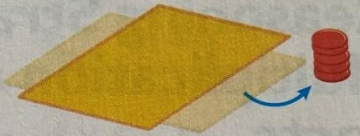
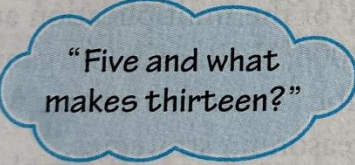

$$50 + 50 = 100$$

Numeracy – Strategies to build Automaticity of Facts

- ▶ Reasoning Strategies for Subtraction Facts
 - ▶ Subtraction as Think-Addition
 - ▶ Compensation
 - ▶ Partial Subtraction
 - ▶ Constant Difference
 - ▶ Down Under 10
 - ▶ Take from 10

Numeracy – Strategies to build Automaticity of Facts

Think-Addition for $13 - 5 =$ _____

1. Count out 13 <i>and cover.</i>	2. Count and remove 5. <i>Keep these in view.</i>
	
3. Think:  8! 8 left. 13 minus 5 is 8.	4. Uncover.  8 and 5 is 13.

Subtraction as Think Addition

Numeracy – Strategies to build Automaticity of Facts

Compensation – Subtraction

This strategy involves subtracting more than is required, then adding back the extra amount.

$$43 - 27$$

$$43 - 30$$

$$= 13 + 3 \text{ (add back the 3)}$$

$$= 16$$

Numeracy – Strategies to build Automaticity of Facts

Partial Subtraction

The number being subtracted is decomposed into parts. Each part is subtracted separately.

$$57 - 24$$

$$57 - 20 = 37$$

$$37 - 4 = 33$$

Numeracy – Strategies to build Automaticity of Facts

Constant Difference

The difference between two numbers does not change after adding or subtracting the same quantity to both numbers.

$$46 - 38 \text{ (add 2 to both numbers)}$$
$$48 - 40 = 8$$

Numeracy – Strategies to build Automaticity of Facts

Down Under 10

This is a derived fact strategy. Students use what they know to figure out a related fact.

A student may look at $14-8$ and break it into two parts.

$14-4$ to get to 10, then subtract 4 more to get 6.

Numeracy – Strategies to build Automaticity of Facts

Take from 10

$$15 - 8 =$$



$$10 + 5$$

$$- 8$$

$$2 + 5 = 7$$

Think:

(take from the ten, and add the ones)



0+0	0+1	0+2	0+3	0+4	0+5	0+6	0+7	0+8	0+9
1+0	1+1	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+9 <input type="text"/>
2+0	2+1	2+2	2+3	2+4	2+5	2+6	2+7	2+8	2+9
3+0	3+1	3+2	3+3	3+4	3+5	3+6	3+7	3+8	3+9
4+0	4+1	4+2	4+3	4+4	4+5	4+6	4+7	4+8	4+9
5+0	5+1	5+2	5+3	5+4	5+5	5+6	5+7	5+8	5+9
6+0	6+1	6+2	6+3	6+4	6+5	6+6	6+7	6+8	6+9
7+0	7+1	7+2	7+3	7+4	7+5	7+6	7+7	7+8	7+9
8+0	8+1	8+2	8+3	8+4	8+5	8+6	8+7	8+8	8+9
9+0	9+1	9+2	9+3	9+4	9+5	9+6	9+7	9+8	9+9

Start with facts adding 0, plus 1 and plus 2

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

Knowing that adding zero doesn't change the number, and knowing how to add on 1 or 2 to a number will allow the student to indicate mastery of the top three rows, and leftmost three columns. This means they already know 51 of the 100 facts!

Doubles, doubles plus one, doubles minus one, doubles plus two, and doubles minus two

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

The pink area represents all of the doubles, doubles plus one, doubles minus one, doubles plus two, and doubles minus two (remember the commutative property). This adds an additional 29 facts to our mastery of facts! That means 80 facts are all retrievable, not just by memory, but by applying the doubles strategies that build from counting on and counting back.

Numeracy – Strategies to build Automaticity of Facts

Facts to 5, Then 10, Then 20

The mastery of addition and subtraction facts develops by building a strong foundation of “easier” facts that can be used to build fluency with more difficult facts.

The Properties of Addition/Subtraction

Zero Property/Identity Property

When you add zero to a number, the number does not change. $a + 0 = a$ $2 + 0 = 2$

When you subtract zero from a number, the number does not change. $a - 0 = a$ $2 - 0 = 2$

The Commutative Property

When I add two numbers, I can add in any order.

$$a + b = b + a$$

E.g. $4 + 27 = 27 + 4$

The Associative Property

When you add 3 or more numbers, you can choose which 2 numbers to add first.

$$\begin{aligned} a + b + c &= (a + b) + c \\ &= (a + c) + b \\ &= a + (b + c) \end{aligned}$$

$$\begin{aligned} \text{E.g. } 6 + 3 + 4 &= (6 + 4) + 3 \\ &= 10 + 3 \\ &= 13 \end{aligned}$$

Inverse Relationship

Addition and subtraction are related operations. They undo each other. Any addition situation suggests a subtraction situation and visa versa.

$$a + b = c \quad b + a = c \quad c - a = b \quad c - b = a$$

E.g. $4 + 6 = 10$, $6 + 4 = 10$ $10 - 4 = 6$, $10 - 6 = 4$

Literacy – Strategies to build Readers

Reading is ...

- *a meaning-making process;
- *an active, thinking process;
- *an interaction among the reader, the text, and the context;
- *a problem solving task for the purpose of gaining meaning from text/print; and
- *an integrated language process that involves a lifetime of learning.

Literacy – Strategies to build Readers

Reading instruction has three main goals for student achievement:

***comprehension** is the ability to understand, reflect on, and learn from text;

***fluency** is the ability to identify words accurately and to read text with ease, pace, and automaticity (fast, accurate, and effortless identification of words);

*and **motivation** to read is the essential element for actively engaging students in the reading process.

Literacy – Strategies to build Readers

- 1) Speak with and read to your child often – no matter what their ages!
Children need to hear ‘experts’ using language in different contexts (e.g., dinner conversation vs. ordering at a restaurant vs. helping with steps of a problem), and especially need to hear ‘literary’ language (e.g., ‘said the farmer’, ‘I am going to...’, ‘Over in the schoolyard, the kids are playing soccer.’) vs. ‘familiar’ language (how we speak to each other day-to-day).

Literacy – Strategies to build Readers

- 2) Encourage children to re-read texts often – the first few times may be ‘decoding’ the text (problem-solving) and gaining understanding (comprehension); as they continue, they can focus on phrasing, expression and automaticity.
- 3) Support your child using strategies taught in class by
 - a) waiting 3 seconds to see if they try ‘something’ on their own
 - b) given a simple prompt they are able to solve the text
 - c) given a prompt and beginning help, they are able to solve
 - d) if very complex or struggling beyond 3 prompts and 3 seconds, give them the solution and move on.

Literacy – Strategies to build Readers

4) Encourage your child to choose texts that are of interest, not just 'at their level' – these are the 'motivators' that can help your child 'want' to use the strategies they have been taught. Strong background knowledge in a subject area supports comprehension and 'narrows' the scope for problem-solving. Often these texts can be 'shared' with an 'expert' reader.

5) Make sure your child is 'noticing' what they are reading – proficient readers do not read every word, we often have to 'go back to take a closer look' when we start to 'lose' the meaning of the text. Children 'noticing' when something doesn't 'make sense', when it doesn't 'sound right', or doesn't 'look right' is critical for comprehension. 100% accuracy doesn't necessarily mean they have been able to 'make meaning'. Sometimes we need to help children to notice something by asking 'were you right?' and having them 'check' on themselves.