

Basic Facts (+/-) Assessment Charts and Lesson Booklet

Based on strategies from John Van de Walle's book, "Elementary and Middle School Mathematics: Teaching developmentally"

Developed by Jeannie DeBoice & Liz Jackson in SD62 (Sooke)

1. Progress charts
2. Class tracking sheets
3. Lessons

Use the 'test' cards (no icons) to check a student's mastery.

Highlight the known facts on the "My Progress" chart.

Assign the next cards for the student to practice: start with 'icon' cards (with pictures) then non-icon cards (test cards.)

Go through the strategies in this order:

1. Addition 'Anchors'
2. Subtraction 'Anchors'
3. Addition 'Using Anchors'
4. Subtraction 'Using Anchors'

BLM's for cards are available from Jeannie DeBoice
(jdeboice@uvic.ca)

Cards printed on card stock and pre-cut available from Comox School District Print Shop.
Link to catalog p. 25:

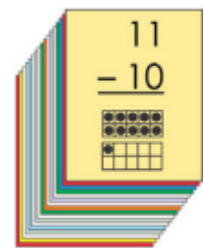
Addition & Subtraction Flash Cards

2 1/2" x 3 1/4", Printed on coloured bristol
(Created by Jeannie DeBoice from Sooke School District)



□ #3030
Addition Flash Cards
180 cards

\$9.00



□ #3029
Subtraction Flash Cards
261 cards

\$10.00

<https://printshop.comoxvalleyschools.ca/apps/pages/catalogue>

My Progress Chart for Addition

Name: _____

+	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12
3	3	4	5	6	7	8	9	10	11	12	13
4	4	5	6	7	8	9	10	11	12	13	14
5	5	6	7	8	9	10	11	12	13	14	15
6	6	7	8	9	10	11	12	13	14	15	16
7	7	8	9	10	11	12	13	14	15	16	17
8	8	9	10	11	12	13	14	15	16	17	18
9	9	10	11	12	13	14	15	16	17	18	19
10	10	11	12	13	14	15	16	17	18	19	20

ANCHORS:

+0/0+

+1/1+

+2/2+

Doubles

+10/10+

USING ANCHORS:

Make Ten (9's)

Make Ten (8's)

Doubles +1

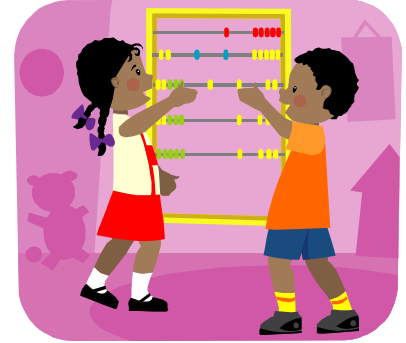
2-part Doubles

								18-8	18-9	18-10
							17-7	17-8	17-9	17-10
						16-6	<u>16-7</u>	16-8	16-9	16-10
					15-5	<u>15-6</u>	<u>15-7</u>	15-8	15-9	15-10
				14-4	<u>14-5</u>	<u>14-6</u>	<u>14-7</u>	14-8	14-9	14-10
			13-3	<u>13-4</u>	<u>13-5</u>	<u>13-6</u>	<u>13-7</u>	13-8	13-9	13-10
		12-2	<u>12-3</u>	<u>12-4</u>	<u>12-5</u>	<u>12-6</u>	<u>12-7</u>	12-8	12-9	12-10
11-0	11-1	11-2	<u>11-3</u>	<u>11-4</u>	<u>11-5</u>	<u>11-6</u>	<u>11-7</u>	11-8	11-9	11-10
10-0	10-1	10-2	10-3	10-4	10-5	10-6	10-7	10-8	10-9	10-10
9-0	9-1	9-2	9-3	9-4	9-5	9-6	9-7	9-8	9-9	
8-0	8-1	8-2	8-3	8-4	8-5	8-6	8-7	8-8		
7-0	7-1	7-2	7-3	7-4	7-5	7-6	7-7			
6-0	6-1	6-2	6-3	6-4	6-5	6-6				
5-0	5-1	5-2	5-3	5-4	5-5					
4-0	4-1	4-2	4-3	4-4						
3-0	3-1	3-2	3-3							
2-0	2-1	2-2								
1-0	1-1									

Anchors:
 Zero (-0; =0)
 -1
 -2
 Doubles
1-apart/2- apart
 Parts of 10
 -10/=10

Using Anchors:
 -9
 -8
Back Down Thru 10

Awesome Addition and Strategic Subtraction!



Created by Jeannie DeBoice &
Liz Jackson

based on John Van de Walle's book, "Teaching
Student-Centered Mathematics"

Before you begin to teach Basic Facts...

- It is critical that you always introduce a new concept (addition, subtractions) through a *real-life* problem.
- Work through several real-life, **concrete** problems involving the concept with as much real-life materials as you can.
- Then, to consolidate these concepts, begin to work with ten-frames (or other manips.)
- Finally, and most importantly, a child **must** stay at the **semi-abstract** level until they show they are **ready** to move on to the cards with icons.

How will I know when they're ready???

What to look for/how to check...

(best done one-on-one)

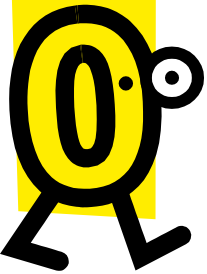
- Child is using the counters, but is answering without moving them (i.e., build 8 & 5, but answers '13' without moving 2 counters over to the 8 to make a ten.)
- Try using the cards and see how they do. If they struggle at all, bring out the ten-frame saying, "Your brain just needs more time building it." (May use cards & real ten-frames together.)
- Have child close his eyes to visualize the ten-frame and 'move counters in his mind'.

Addition *Anchor* Strategies:



$$+1/+2$$

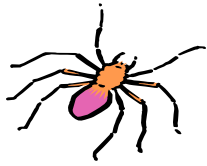
- Start with a **real-life** problem: “You have 5 cookies and Mom gives you 1 more. How many do you have?” **AND** “You have 1 cookie and Mom gives you 5 more.”
- Build numbers 1 – 20 on a double ten-frame, say 8 in one colour, adding 1 in another colour.
- Ask: “How much is 8 and 1?” Write $8+1=9$ and $9=8+1$
- Remind them how this connects to ‘1 more than’
- *Move to icon cards when you see that they are beginning to answer before adding the counter in.*
- *When full mastery of $+1/1+$ is shown, start again with $+2/2+$*



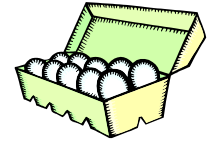
$$+0/0+$$



- Start with a **real-life problem**: “Mom gives you 5 cookies and then she gives you **no** more. How many do you have?” (*For some children, this is a hard concept!*)
- Build numbers 1 – 20 on a double ten-frame. Ask, “How much is ___ and 0?”
- Record $10+0 = 10$ and $10 = 10 +0$
- Write the equations $9 + 0 = \underline{\quad}$ and $0 + 6 = \underline{\quad}$ & have them solve it on the double ten-frame.
- *Help them come to the generalization that +0 doesn't change the number.*



Doubles



Use a G'Nizer/Part-Whole mat:

- Build 5 in each of the two small sections.
- Ask students to push both 5's up. "How much is there all together?"
- Ask: "How do you know without counting?"
- "What in our world is 5 & 5?" (*our fingers!*)
- Collect objects representing doubles and put them up on a bulletin board with the addition equations on strips beside each item.

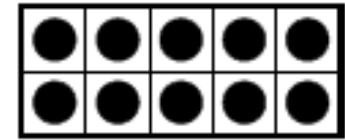
- Connect the objects (e.g., egg carton, spider) to the icons on the cards and say:

"6+6 is the 'egg carton double' – how much is 6 + 6?"

*The idea is to get them to visualize or even go over to the real thing...**not** to count the eggs in the picture!*

Always relate back to the bulletin board of Doubles in your classroom.

$$+10/10+$$



- Use double ten-frames and 2-coloured counters.
- Have students build 10 on the top ten-frame in one colour and 5 on the bottom ten-frame in another colour.
- Record '10 and 5 is ___'
- Ask: "How many is 10 and 5?"
- Watch: some may just know, some may count **on** and some may count **all**.

Our aim is to help kids see the *pattern* - not count.

- Do this for about 5 equations, the stop and ask: "Do you see a pattern?" Circle the '+5' and the '5' in 15.
- Repeat for 5 more equations, but this time put 10 on the bottom frame & write '8+10= ___'
- Redo this lesson another day, doing all the equations **in order** from +1 to +9

Subtraction *Anchor* Strategies:



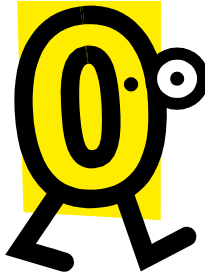
$$-1/-2$$

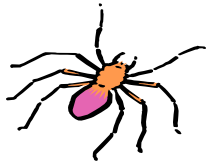


- Start with a **real-life** problem: “You have 5 cookies and you give your sister 1. How many do you have now?”
- Build numbers 1-20 on a double ten-frame. Ask: “How much is ___ take away 1?” Write $10-1=9$
- Remind them how this connects to ‘1 less than’.
- *Move to icon cards when you see evidence that they are beginning to answer before moving the counter **away**.*
- When full mastery of -1 is shown using the symbol cards, start again with -2.
- *Some children will do this easily, while others will need a longer time with manip – hence the need to **individualize**.

$-0/=0$

- Start with a **real-life problem**: “You have 5 cookies and you give **zero** to your sister. Now how many do you have?” (For some children, this is a hard concept!)
- Build numbers 1-20 on a double ten-frame. Ask: “How much is ___ take away 0?”
- Write $10-0 = 10$ and $10 = 10-0$
- *Help them come to the generalization that -0 doesn't change the number.*
- For **=0**, start with 1-20 on the ten-frame, then create a story where all are subtracted. “How many have we got left?”
- Finally, write the equations $9-0=$ __ and $9-9=$ __ on the board. Students solve on the ten-frame.





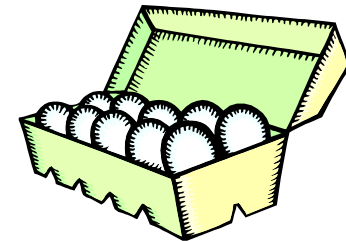
Subtraction Doubles



Use a G’Nizer:

- Build 6 & 6 in 2 different colours on G’Nizer.
- Turn it so 12 (in the large section) is across the top.
- Have students show 12-6 by pulling 6 down into one section. Ask: “How much is left?” “How do you know that without counting?”

- Connect this to the Doubles icon of the egg carton and say: “An egg carton has 12 eggs. What if 6 were gone? How many are left? How do you know?”



- Continue with other Doubles.

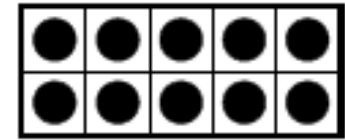
1 & 2 apart



- This is a great time to introduce the *other* concept of subtraction as *difference*.
- Have student build 10 on their ten-frame.
- Say: I had 10 cookies and gave my sister 9. How many are left? What's the *difference*?"
- Record "10-9" on the board. Have them solve on the ten-frame.
- Now say: I had 10 stuffies. My sister had 9. What's the difference between my number of stuffies and hers?"
- Ask: "*How far apart are 10 & 9?*"
- Make the connection between the ten-frame and the number line (ex. $10-9=1$ and 10 & 9 are *one apart* on the number line.)
- In a later lesson, repeat for 2-apart.

Parts of 10

$$-10/=10$$



Parts of 10:

- You will have done ‘re-naming’ ten on the G’Nizer. Review this first with the students. (“Show me 10 is 1 & 9, 2 & 8...”)

TIP: *Set G’Nizer up with counters in 2 rows of 5 – like a ten-frame!*

- Relate these ideas to the ten-frame by building 10, then ask: “What is $10-4$? What’s the other part of 10?”

-10/=10

- Have students build a teen number (14) on a double ten-frame.
- Record on the board.
- Now add “ $-10 = \underline{\quad}$ ” and ask: “What’s the quickest, easiest way to take off 10?” *Most will wipe off the ten-frame.*
- Do all the teens minus 10.
- Now write ‘ $14-4 = \underline{\quad}$ ’ and ask: “What’s the quickest, easiest way to take off 4?”
- Do all the teens minus a single digit.



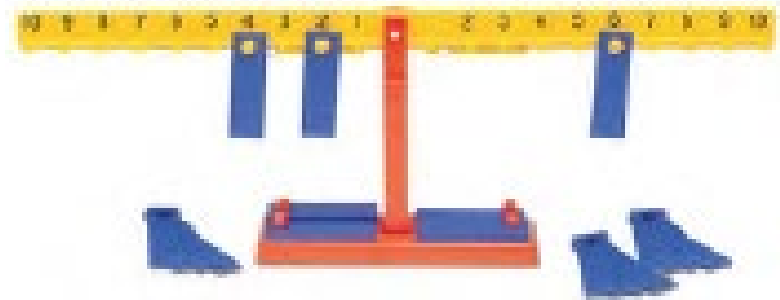
$$+9/+8$$



Note: do +9 lesson first. Later do +8 lesson.

- Use a double ten-frame.
- Build 9 with one colour and 6 with another colour.
- Say: “6+9 isn’t very *friendly*. Which number is really close to 10? Can we make 9+6 more *friendly*? (TIP: **Have students put the rest of their counters away – otherwise, some may dip into the pot for a counter, making the 9 into a 10 but changing the value of the equation!**)

- Most will take one from the 6 to make the 9 into a 10.
- **Using 2 colours really shows how $9+6 = 10+5$*
- *Record $9+6 = 10+5$ on the board and ask: Is this true? Can we write this?*
- Show this equation on a ‘number scale’ to ‘prove’ the equality (also covering the algebra outcome!)



Doubles +1



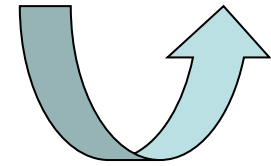
+1

- Have students lay out 6 yellow counters while you do the same on the Doc Cam.
- Have them arrange them into 2 parts (symmetrically)
- Ask: "How much? What double is this?"
- Cover the Doc Cam and add 1 red to one the groups of 3.
- Click the overhead on and say: "Can you still see the double? How can we figure out how much there is now **without counting?**"
- Have them show $3 + 4$ in the same way, with 1 red counter added to the double 3.

$$3+4$$

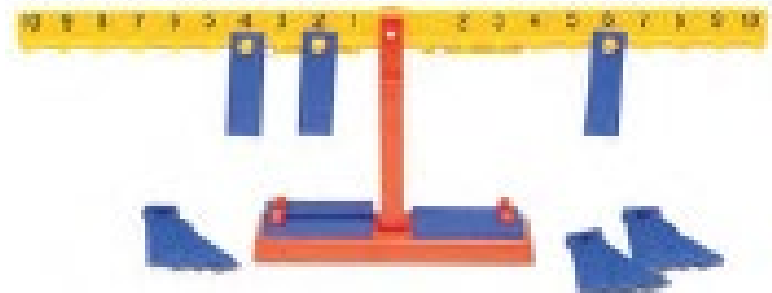
$3 + 3 = 6$
So $3 + 4 = 7$

2-apart Doubles



- Have students lay out a group of 3 and a groups of 5 in the same colour side by side.
- Ask: “How far apart are these numbers?”
- *May help to look on a number line to see that they are **2 apart**.*
- Say: “When we add 2-apart numbers, there is a double hiding *between* these 2 numbers.”
- Have children (and you model on overhead) move one from the larger set and give it to the smaller set.
- Ask: “What double is that?”
- Write $3 + 5 = 4 + 4$

Showing it of the number scale can reinforce this idea:





$$-9/-8$$



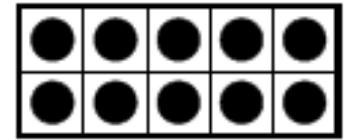
(Note: Do -9 lesson first. Do -8 in a later lesson.)

- Have students use a double ten-frame while you build on overhead.
- Have them build a teen number (14).
- Ask: “What’s the quickest, easiest way to take off 9?” (8?)
- Have students discuss their strategy with a partner. See if partner did it the same way they did.

Be prepared for at least 2 different ways:

- Some will take off 9 (8) right out of the full ten-frame.
- Others will clear off the smaller frame (4) then take the rest (5) from the full ten-frame.
- Scribe both ways on chart paper to keep for reference.

Back down thru 10



- Use a double ten-frame.
- Have students build a teen number between 11 – 16. (say 14)
- Ask: “What’s the quickest, easiest way to take off 5?”
- Have students discuss with a partner to check who does it the same as they did.
- Do the others (see *underlined facts of the assessment sheet.*)

Be prepared for at least 2 different ways:

- Some will take off all of the lower frame (4) and one more from the 10.
- Others will take the 5 right out of the full ten-frame.

For the most part, the more straight forward way is the first one.

- Scribe both (all!) ways on a chart to keep for reference.

Strategy Selection Practice



- Once a child has shown mastery of these strategies, they need to practice *retrieving* them. Otherwise, they won't use them automatically.
- Children use the *Strategy Selection Boards* in pairs. They shuffle the 'test cards' and turn one over.
- First they tell which strategy they'd use to solve the addition or subtraction, then they place the card in that solve and solve it.