Math Basic Facts Intervention Strategy – Flashcard Procedure

For: Students of any grade who have not mastered basic facts or have not reached the benchmark on the AIMSweb Math Computation assessment

Materials:

- Basic facts flashcard "practice sets" for each student; each card contains 1 fact (Each student should have a set of 5-10 "practice" flashcards. In a set of five cards, three of the cards should have basic facts that the student has previously mastered, and the other two cards contain new or unmastered numbers/basic facts, preferably related to each other or to a known fact – as in "fact families".) If desired, the interventionist may choose to have a set of 10 "practice" cards instead—8 "knowns" and 2 "unknowns". **Flashcards can be commercial cards or hand-made.**
- Flashcard "review sets" for each student (made up of basic facts within a set that the student has demonstrated s/he knows without help over 3 consecutive days) – "Knowing" means begin able to state the basic fact answer within 3 seconds.
- A folder to keep the flashcards in and/or rings to keep the flashcards on; ideally, each child would have an "Unknown Set", a "Practice Set", and a "Review Set" of cards.
- Recording sheet

Recommended Duration and Frequency: This intervention should be conducted at least 3 times per week for 10 – 15 minutes per session. Monitor the student's progress once a week or twice monthly using the AIMSweb Computation probes. When the student's score is at the benchmark/target for 3 consecutive monitors and teacher observation confirms that the skill has been transferred to classroom work, the intervention may be discontinued.

Steps for Intervention:

1. Administer all flashcards in a set to the student initially, asking for basic fact answers. For example, an interventionist may use the "ones" and "twos" addition facts to start with, expanding into the other levels as the student is ready. The student should give the answer within 3 seconds for it to be counted correct.
2. Select 3 (or 8, if working with a bigger set) "known" flashcards, and 2 flashcards containing facts that are unknown. (It helps to choose related facts – facts in "fact families".) This becomes the student's "Practice Set". If the student doesn't know 3 facts, you may select less than 3 "known" cards. If the student knows no facts, select 2 unknown facts for the "Practice Set" that have already been presented in class. Select a strategy or strategies (attached to this document) that may help the student learn the unknown facts you have chosen. Teach the strategy(ies) to the student before moving to Step 3.
3. Use the following sequence to implement the intervention:
    a. **Explain:** Teacher says, "Today you're going to practice saying the answers to some basic facts. When I point to the left of a fact, figure out the answer in your head. When I touch under the fact, say the problem and the answer." Note: A student should always practice a basic fact by saying the whole fact problem and the answer. This helps students memorize the "verbal chain".

b. **Model:** Teacher says, "I'll show you how. My turn." Teacher models for student, first pointing to the left of the fact and "thinking", and then pointing under the fact and saying the entire problem and the answer—"7 plus 8 is 15". The teacher may also reinforce the strategy, as well. ("7 + 7 is 14, plus one more is 15—doubles plus one")

c. **Practice:** Teacher says, "Each time I touch to the left of the fact, you think about the answer. Each time I touch under the fact, you say the problem and the answer. Your turn." Teacher practices with the student, going through all 5 cards repeatedly until the student consistently responds correctly and immediately to all 5 cards. Teacher maintains a brisk pace, assisting as needed (see "d" below), with little pause between cards. The teacher can mix up the cards periodically throughout the session.

d. **Correction:** Any time a student responds incorrectly, the teacher immediately says, "My turn," demonstrates the correct response and reminds the student of the strategy, then says, "Your turn." The student should then respond to the same card. The teacher backs up 2 cards and continues forward again with the process described in "c" above so that the number (answer) given incorrectly comes back up again. Keep going through the cards until your practice time is over.

4. **Recording Sheet** (attached): Every day that a child gives the answer of a "Practice Set" fact correctly the <u>first time per day</u> it is presented, a tally mark is placed after the fact on the Recording Sheet. When the child has 3 tally marks (3 days in a row of saying the answer correctly), the card moves to the "Review Set", and a new card from the "Unknown Set" is put in its place. If a "Practice" word is read incorrectly, a "—" is recorded instead of a tally. Never should a student's "Practice Set" contain more than 5 - 10 cards or more than 2 "unknowns".
5. **Review Set: The "Review Set" should be reviewed once weekly.** An "R" should be recorded on the checklist at the point when the card enters the "Review Set". Then tallies or "—" marks should continue to be recorded on the checklist. If a "Review Set" card answer is said incorrectly by the child, the card is moved back to the "Practice Set" and a "P" is recorded on the checklist. (If this puts too many cards into the "Practice Set", an unknown card can be taken out.) The child must say the answer for this card correctly 3 days in a row in order to move it back to the "Review Set".

Sample of a Recording Sheet:

0 + 0	| R |||
0 + 1	___ ___ | | ___ | | | R | | |
0 + 2	___ ___ ___ ___ | ___ | ___ ___ | | | R | |
0 + 3	___ | | | R | | ___ P ___ | |
0 + 4	___ ___ ___ ___

6. **Adaptation:** In addition to following the above sequence, have the student write each of the facts on a white markerboard or on paper. **The writing of the fact reinforces it.**
7. If a student fails to make progress, reduce the number of unknown cards to only 1. Model the "unknown" answer several times before asking the student to give the answer. Have the student write the problem and answer while saying it several times.

Math Basic Facts Intervention - Flashcard Procedure – Integrity Check

Interventionist:_____ Date:_____ Grade Level:_____ Tier_____
Integrity Monitor:_____

Descriptor - Student	Yes	No	N/A
Student has scored below benchmark on the AIMSweb Computation universal screening.			

Descriptor - Materials	Yes	No	N/A
Student has a Practice Set of 5 (or 10, for the bigger set) or fewer cards. Student readily knows the answers of 3 (or 8, for the bigger set) facts in the Practice Set.			
Student has a Review Set of cards s/he has correctly answered on 3 consecutive days.			
Interventionist has a recording sheet.			

Descriptor - Interventionist	Yes	No	N/A
Interventionist maintains an environment conducive to task completion (quiet, manages behavior issues, engages student, etc.)			
Interventionist follows the steps for implementing the intervention, including explaining, modeling, using hand signals, describing the basic fact strategy, and having the student state the entire problem along with the answer.			
The "Practice Set" flashcards seem appropriate for the student's skill level.			
Interventionist scores the student responses accurately on the recording sheet.			
Interventionist assists the student if s/he has difficulty using the designated correction procedure, repeating the basic fact strategy, if necessary.			
The intervention is conducted at a brisk pace at least 3 times per week for 10-15 minutes.			
Flashcards are moved to the "Review Set" if the student produces the answer correctly 3 days consecutively.			
"Practice Set" cards are practiced every time the student meets with the teacher; "Review Cards are practiced once weekly.			
Student's progress is monitored using AIMSweb COMP at least twice monthly.			

Basic Facts Flashcard Procedure Integrity Check Summary:_____ of _____ applicable components are observed.

Notes:

(Ideas for this intervention borrowed from the RtI Center: scred.k12.mn.us; Elkonin Boxes Integrity Checklist)

Math Basic Facts Intervention - Flashcard Procedure - Recording Sheet **Student:_____**

Addition or Multiplication (Circle one.)

ZEROS	
0 +/X 0	
0 +/X 1	
0 +/X 2	
0 +/X 3	
0 +/X 4	
0 +/X 5	
0 +/X 6	
0 +/X 7	
0 +/X 8	
0 +/X 9	
0 +/X 10	
0 +/X 11	
0 +/X 12	
ONES	
1 +/X 0	
1 +/X 1	
1 +/X 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	
1 +/X 11	
1 +/X 12	
TWOS	
2 +/X 0	
2 +/X 1	
2 +/X 2	
2 +/X 3	

2 +/X 4	
2 +/X 5	
2 +/X 6	
2 +/X 7	
2 +/X 8	
2 +/X 9	
2 +/X 10	
2 +/X 11	
2 +/X 12	
THREES	
3 +/X 0	
3 +/X 1	
3 +/X 2	
3 +/X 3	
3 +/X 4	
3 +/X 5	
3 +/X 6	
3 +/X 7	
3 +/X 8	
3 +/X 9	
3 +/X 10	
3 +/X 11	
3 +/X 12	
FOURS	
4 +/X 0	
4 +/X 1	
4 +/X 2	
4 +/X 3	
4 +/X 4	
4 +/X 5	
4 +/X 6	
4 +/X 7	
4 +/X 8	
4 +/X 9	
4 +/X 10	

4 +/X 11	
4 +/X 12	
FIVES	
5 +/X 0	
5 +/X 1	
5 +/X 2	
5 +/X 3	
5 +/X 4	
5 +/X 5	
5 +/X 6	
5 +/X 7	
5 +/X 8	
5 +/X 9	
5 +/X 10	
5 +/X 11	
5 +/X 12	
SIXES	
6 +/X 0	
6 +/X 1	
6 +/X 2	
6 +/X 3	
6 +/X 4	
6 +/X 5	
6 +/X 6	
6 +/X 7	
6 +/X 8	
6 +/X 9	
6 +/X 10	
6 +/X 11	
6 +/X 12	
SEVENS	
7 +/X 0	
7 +/X 1	
7 +/X 2	
7 +/X 3	

7 +/X 4	
7 +/X 5	
7 +/X 6	
7 +/X 7	
7 +/X 8	
7 +/X 9	
7 +/X 10	
7 +/X 11	
7 +/X 12	
EIGHTS	
8 +/X 0	
8 +/X 1	
8 +/X 2	
8 +/X 3	
8 +/X 4	
8 +/X 5	
8 +/X 6	
8 +/X 7	
8 +/X 8	
8 +/X 9	
8 +/X 10	
8 +/X 11	
8 +/X 12	
NINES	
9 +/X 0	
9 +/X 1	
9 +/X 2	
9 +/X 3	
9 +/X 4	
9 +/X 5	
9 +/X 6	
9 +/X 7	
9 +/X 8	
9 +/X 9	
9 +/X 10	

9 +/X 11	
9 +/X 12	
TENS	
10 +/X 0	
10 +/X 1	
10 +/X 2	
10 +/X 3	
10 +/X 4	
10 +/X 5	
10 +/X 6	
10 +/X 7	
10 +/X 8	
10 +/X 9	
10 +/X 10	
10 +/X 11	
10 +/X 12	
ELEVENS	
11 +/X 0	
11 +/X 1	
11 +/X 2	
11 +/X 3	
11 +/X 4	
11 +/X 5	
11 +/X 6	
11 +/X 7	
11 +/X 8	
11 +/X 9	
11 +/X 10	
11 +/X 11	
11 +/X 12	
TWELVES	
12 +/X 0	
12 +/X 1	
12 +/X 2	
12 +/X 3	

12 +/X 4	
12 +/X 5	
12 +/X 6	
12 +/X 7	
12 +/X 8	
12 +/X 9	
12 +/X 10	
12 +/X 11	
12 +/X 12	

Math Basic Facts Intervention - Flashcard Procedure - Recording Sheet **Student:_____**

Subtraction

ZEROS	
0 - 0	
1 – 0	
2 – 0	
3 – 0	
4 – 0	
5 – 0	
6 – 0	
7 – 0	
8 – 0	
9 – 0	
10 – 0	
11 – 0	
12 - 0	
ONES	
1 – 1	
2 – 1	
3 – 1	
4 – 1	
5 – 1	
6 – 1	
7 – 1	
8 – 1	
9 – 1	
10 –1	
11 – 1	
12 – 1	
TWOS	
2 – 2	
3 – 2	
4 – 2	
5 – 2	

6 – 2	
7 – 2	
8 – 2	
9 – 2	
10 - 2	
11 – 2	
12 – 2	
THREES	
3 – 3	
4 – 3	
5 – 3	
6 – 3	
7 – 3	
8 – 3	
9 – 3	
10 – 3	
11 – 3	
12 – 3	
13 - 3	
FOURS	
4 – 4	
5 – 4	
6 – 4	
7 – 4	
8 – 4	
9 – 4	
10 – 4	
11 – 4	
12 – 4	
13 - 4	
14 - 4	
FIVES	
5 – 5	
6 – 5	
7 – 5	

8 – 5	
9 – 5	
10 – 5	
11 – 5	
12 – 5	
13 – 5	
14 – 5	
15 - 5	
SIXES	
6 – 6	
7 – 6	
8 – 6	
9 – 6	
10 – 6	
11 – 6	
12 – 6	
13 – 6	
14 – 6	
15 – 6	
16 - 6	
SEVENS	
7 – 7	
8 – 7	
9 – 7	
10 – 7	
11 – 7	
12 – 7	
13 – 7	
14 – 7	
15 – 7	
16 – 7	
17 - 7	
EIGHTS	
8 – 8	
9 – 8	

10 – 8	
11 – 8	
12 – 8	
13 – 8	
14 – 8	
15 – 8	
16 – 8	
17 – 8	
18 - 8	
NINES	
9 – 9	
10 – 9	
11 – 9	
12 – 9	
13 – 9	
14 – 9	
15 – 9	
16 – 9	
17 – 9	
18 – 9	
19 - 9	
TENS	
10 – 10	
11 – 10	
12 – 10	
13 – 10	
14 – 10	
15 – 10	
16 – 10	
17 – 10	
18 – 10	
19 - 10	
20 - 10	
ELEVENS	
11 – 11	

12 – 11	
13 – 11	
14 – 11	
15 – 11	
16 – 11	
17 – 11	
18 – 11	
19 – 11	
20 – 11	
21 - 11	
TWELVES	
12 – 12	
13 – 12	
14 – 12	
15 – 12	
16 – 12	
17 – 12	
18 – 12	
19 – 12	
20 – 12	
21 - 12	
22 - 12	

Math Basic Facts Intervention - Flashcard Procedure - Recording Sheet **Student:_____**

Division

ONES	
1/1	
2/1	
3/1	
4/1	
5/1	
6/1	
7/1	
8/1	
9/1	
10/1	
11/1	
12/1	
TWOS	
2/2	
4/2	
6/2	
8/2	
10/2	
12/2	
14/2	
16/2	
18/2	
20/2	
22/2	
24/2	
THREES	
3/3	
6/3	
9/3	
12/3	
15/3	

18/3	
21/3	
24/3	
27/3	
30/3	
33/3	
36/3	
FOURS	
4/4	
8/4	
12/4	
16/4	
20/4	
24/4	
28/4	
32/4	
36/4	
40/4	
44/4	
48/4	
FIVES	
5/5	
10/5	
15/5	
20/5	
25/5	
30/5	
35/5	
40/5	
45/5	
50/5	
55/5	
60/5	
SIXES	
6/6	

12/6	
18/6	
24/6	
30/6	
36/6	
42/6	
48/6	
54/6	
60/6	
66/6	
72/6	
SEVENS	
7/7	
14/7	
21/7	
28/7	
35/7	
42/7	
49/7	
56/7	
63/7	
70/7	
77/7	
84/7	
EIGHTS	
8/8	
16/8	
24/8	
32/8	
40/8	
48/8	
56/8	
64/8	
72/8	
80/8	

88/8	
96/8	
NINES	
9/9	
18/9	
27/9	
36/9	
45/9	
54/9	
63/9	
72/9	
81/9	
90/9	
99/9	
108/9	
TENS	
10/10	
20/10	
30/10	
40/10	
50/10	
60/10	
70/10	
80/10	
90/10	
100/10	
110/10	
120/10	
ELEVENS	
11/11	
22/11	
33/11	
44/11	
55/11	
66/11	

77/11	
88/11	
99/11	
110/11	
121/11	
132/11	
TWELVES	
12/12	
24/12	
36/12	
48/12	
60/12	
72/12	
84/12	
96/12	
108/12	
120/12	
132/12	
144/12	

Thinking Strategies for Learning the Addition Facts

1. Adding zero: Students can quickly grasp the rule for adding zero; the sum is always the other number. 8+0=8, 0+4=4

2. Counting on by 1 or 2: Students can find sums like 5 + 1 or 6 + 2 by simply counting on. This thinking strategy allows students to check off 18 of the addition facts. That leaves 63 facts to be learned.

3. Sums to 5: Students can learn combinations to 5, such as 3+2 or 4+1.

4. Sums to 10: Students can learn combinations to 10, such as 6 + 4 or 8 + 2. More facts can be crossed off the list of 100 and we are down to 56 facts to learn.

5. Doubles: For whatever reason, students seem to be able to remember the sums of doubles. That might be a consequence of skip counting in earlier grades. The consequence of knowing doubles is another 6 facts can be checked off our list. That leaves 50 facts to learn, we're halfway home.

6. Adding 10's: Students can quickly see the pattern develop when adding tens, the units digit stays the same.

7. Doubles plus one: This strategy overlaps the other strategies of doubles and counting on by one. While more sophisticated, students should be taught to use this strategy when the addends are consecutive numbers. For instance, 7 + 8 becomes 7 + 7 + 1. Another example, 8 + 9 becomes 8 + 8 + 1.That's seven more off the list.

8. Doubles plus two: This method works when the addends differ by two. When this occurs it is possible to subtract 1 from one addend and add one to the other addend. This results in a doubles fact that has already been memorized, 7 + 5 becomes 6 + 6. Another example, 6 + 8 becomes 7 + 7. Some people call the **Doubles Plus 2** strategy.

9. Sharing Doubles - attack the problem differently. Using the Doubles plus 2 strategy, 6 + 8 becomes 6+6+2. 7+5 becomes 5+5+2. We now have 31 facts left to learn.

9. Nines: It should be pointed out to students that when adding nine, the ones digit in the sum is always one less than the number added to 9. For example 7 + 9 = 16, the 6 is one less than 7. Another example: 5 + 9 = 14. 45 facts to go.

10. Commutativity: By changing the order, 3 + 4 to 4 + 3, it should be pointed out that's an additional 21 facts the students now know. That leaves 10 facts to learn. But it's really five because the commutative property can be used on those 10.

Thinking Strategies for Learning the Subtraction Facts

1. Fact families: This strategy is the most commonly used and works when students understand the relationship between addition and subtraction. When students see 6 – 2 and think 2 + ? =6. However, if this strategy is used with the following strategies, students will find greater success in a shorter period of time.

2. Counting backwards: This method is similar to Counting On used in addition. It isn't quite as easy. Some might think if you can count forward, then you can automatically count backward. This is not true--try saying the alphabet backwards. Students should only be allowed to count back **at most** three.

3. Zeros: The pattern for subtracting zero is readily recognizable. 5 – 0 = 5

4. Sames: This method is used when a number is subtracted from itself; this is another generalization that students can quickly identify. 7 – 7 = 0**.**

5.Recognizing Doubles: Recognizing the fact families associated with adding doubles.

6. Subtracting tens: This is a pattern that students can pick up very quickly, seeing that the ones digit remains the same.

7. Subtracting from ten: Recognizing the fact families for Sums to 10.

8. Subtracting nines: Again, the pattern that develops for subtracting 9 can be easily identified by most students. They can quickly subtract 9 from a minuend by adding 1 to the ones digit in the minuend. 17–9=8, 16–9=7.

9. Subtracting numbers with consecutive ones digits: This pattern will always result in a difference of 9, 16–7=9, 13–4,=9 15–6=9 all have ones digits that are consecutive and the result is always 9.

10. Subtracting numbers with consecutive even or consecutive odd ones digits: This pattern will always result in a difference of 8. 14–6=8, 13–5=8, 12–4=8.

Thinking Strategies for Learning the Multiplication Facts

1. Commutativity: As with learning the addition facts, order can be changed when learning the multiplication facts. Hence, rather than learning 100 facts, we really only have to learn 55 facts.
2. Multiplication by zero: Students can easily grasp that 0 times any number is zero.
3. Multiplication by one: Again, the generalization is easy for students to see that 1 times any number is the number.
4. Multiplication by two: Students should be taught that multiplying by two is the Doubling strategy used in addition. Using the first four strategies, we have learned 27 more facts; only 28 remain to be learned.
5. Multiplication by five: Students can often be taught the fives by referring to the minute hand on a clock, or just counting by 5's.
6. Squaring: As with the addition facts, students seem to learn square numbers faster than other facts.
7. Multiplication by ten: This pattern is very easy for students to see.
8. Multiplication by nine: Patterns emerge when multiplying by 9. One pattern is the sum of the digits in the product is always equal to 9. The other pattern is the ten's digit is always one less than the factor multiplied by 9. $9 \cdot 6 = 54$. Notice $5 + 4 = 9$ and the 5 in the product is one less 6, the number being multiplied by 9. Another example, $8 \times 9 = 72$, the sum is 9 and the tens digit is one less than the tens digit. Only 10 facts to go.
9. Distributive property: Students should feel comfortable breaking numbers apart and using previously learned information. For instance, $7 \cdot 6$ might be rewritten as $7(5 + 1)$. This would allow a student to use the $7 \cdot 5$ fact that he knows and add that to the $7 \cdot 1$ fact to get 42**.**

Thinking Strategies for Learning the Division Facts

1. Fact families: This strategy works when students understand the relationship between multiplication and division. When students see $24 \div 6$, they have to relate that to $6 \cdot ? = 24$.

From: hanlonmath.com