

Basic Facts

Mastery of basic facts is essential for developing mental math and estimation skills. This, in turn, enables students to *problem solve, reason, communicate and make connections* in order to access higher-level mathematics.

Mastering basic facts (arithmetic and other) can be thought of as a three-step process.

Students should have a **foundation**

on which to build the **recall**,

along with appropriate practice for
fluency and automaticity.

Approaches to Effective Addition/Subtraction Practice

Often students are asked to “practice” facts they do not know (as in holding up an unknown math fact flash card or taking a lengthy timed test for which a student does not have a strategy to recall except for finger counting or fast counting on). This kind of drill does NOT constitute effective or sound practice but creates math anxiety, frustration, and over-reliance on ineffective strategies such as those mentioned above.

Practice might take the form of that embedded in: problem solving or games, flash card or computer drills, games such as “Around the World” or “I Have, Who Has?”.

Problem solving

Opportunities such as the ones below allow students to practice combinations of a number and to demonstrate understanding of part/whole relationships:

- **Facts embedded in problems should be frequently posed.**
 - **Tell me all of the combinations that make up _____. (focus on 5, then 10 then 20)**
 - **Sally’s cat had 8 kittens. Some are black and some are white. How many of each could there be? (modify the number and scenario for each fact)**

Games

- **Card games such as “War” may be played for speed facts, laying down two cards, finding the sum, then determining which is greater than and which is less than.**
- **Games which target landmark numbers such as five and ten**
- **Dice may be used to generate facts, having students record vertically and horizontally.**
- **Group games such as “Around the World”**
 - **All students should be expected to record on slates or paper**
 - **Entire “fact” should be stated/written**
 - **“Missed” facts should be orally repeated by individuals and by the group**
 - **Students should be given the card with the fact they missed, then called on intermittently to repeat their “fact(s)” rather than the teacher keeping all flash cards.**
 - **Group games such as “I Have...Who Has?” may also be used for more student engagement**

Flash Cards

- **Varied** forms of **flash cards** such as **triangular cards**, **vertical** and **horizontal cards showing the entire fact**, and **cards with visual cues** may be used.
- Flash cards should be clearly visible to all students.
 - Entire fact should be modeled for students so that the fact family is visible and number relationships seen.
 - Students should state entire fact, not just the sum.

Timed tests *may be used for assessment and drill but **should be:***

- **Used infrequently and diagnostically to determine known and unknown facts**
- **Used instructionally to focus only on facts students have already memorized (see chart below)**
- **Of reasonable length**
- **Designed for improvement and success, not to emphasize failure**
- **Focused on accuracy, rather than speed** (students should be expected to master all facts before requiring a “time limit”. They then work to improve their own time rather than beat another’s.

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