

Home Connections in Mathematics

Student Generated Algorithms

For most adults, learning to add, subtract, multiply, and divide involved learning standard methods and algorithms. Many adults are proficient in these procedures but many are not and still struggle to be able to justify how to be certain that the resulting solutions make sense. As students learn to understand operations and develop ways of solving problems, they move from counting, to reasoning, to mastery. The development of number sense involves learning reasoning strategies to make sense of calculations.

So, while many of us invested considerable time and effort working with standard methods, student-generated methods act as bridges toward mastery and are instrumental to developing number sense.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

32 - 9 is the same as 32 - 10 + 1

Students who generate their own strategies:

1. Make fewer errors;
2. Require less re-teaching;
3. Develop number sense;
4. Foster stronger mental computation and estimation skills;
5. Often calculate more efficiently than those using standard algorithms; and
6. Feel more confident about their own abilities.

So, encourage sense-making as your child attempts calculations, the methods they use and continue to refine will support their development as successful mathematicians! For more information and reading please check out the following resource at the link below.

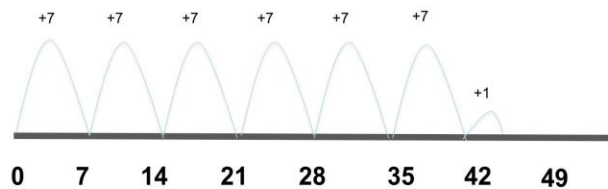
[Learning Mathematics Vs Following Rules](#)

Skip Counting Up/Multiplying to Divide

Ex: $43 \div 7$

Let's find how many times 7 appears in 43.

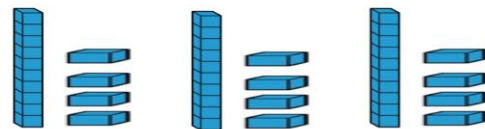
$$43 \div 7 = 6 \frac{1}{7}$$



7 'goes into' or 'scales into' 43 6 times with 1 remaining that don't scale in OR with $\frac{1}{7}$ of a group of 7 remaining.

Divide Using Base Ten Ex: $43 \div 3$

$$43 \div 3 = 14 \frac{1}{3}$$



Using base ten we can divide 43 into 3 groups which have 14 and $\frac{1}{3}$ in each group.

Flexible Division

Flexible division algorithms look similar to the standard "long division" algorithm. The flexible algorithm allows students to use known multiplication facts to decompose the dividend into friendly parts. The parts are subtracted from the whole, until no multiples of the divisor are left. Students keep track of the parts as they are removed.