Subtraction and Division – Mental Math or Procedure/Strategy Examples

Division:

- **Subtracting groups of the divisor***

159 ÷ 13   159   29   OR Use the Big 7 method of recording (see below)
10 x 13 = 130 -130   -26
2 x 13 = 26   29   3
12 r3

- **Breaking the problem into parts***

150 ÷ 48 = (50 ÷ 48) + (50 ÷ 48) + (50 ÷ 48) = 3 r 6
(There is one 48 with 2 left over in each 50)
OR
159/13
Break into 130 + 29, 130 divided by 13 is 10; 29 divided by 13 is 2 with 3 remaining

- **Transferring the problem into an equivalent problem that is easier to solve.***

1400 ÷ 35 = 200 ÷ 5 (divide both numbers by 7)
928/16 = 464/8 = 232/4 = 116/2 = 58

- **Solving and easier related problem, then compensating***

247 ÷ 13
Solve 260 ÷ 13 (There are 20 thirteens in 260, but 247 is 13 less than 260. So there are only 19 thirteens in 247)

- **Dealing out into groups***

159/13
Give 10 to each group; that uses up 130; 29 is left
Give 1 more to each group; that uses up 13; 16 is left
Give 1 more to each group; 3 is left.
The result is 12 in each group, remainder 3

Subtraction: 465 – 129

- **Subtract one number in parts from the other.***

465 – 100 = 365 OR   465 – 125 = 340
365 – 20 = 345   340 – 4 = 336
345 – 5 = 340
340 – 4 = 336

- **Change one number, then compensate for the change.***

465 – 130 = 335   OR   460 – 129 = 331
335 + 1 = 336   331 + 5 = 336

- **Add up from the number being subtracted.***

129 + 1 = 130   OR   129 + 130 = 429
130 + 300 = 430   429 + 1 = 430
430 + 35 = 465   430 + 35 = 465
1 + 300 + 35 = 336   300 + 1 + 35 = 336

- **Transform the entire problem to an equivalent problem that is easier to solve.***

465 – 129 = 466 – 130
466 – 130 = 336

- **Subtract each column and record each difference, whether it is positive or negative.***

400 – 100 = 300
60 – 20 = 40
5 – 9 = ~4
300 + 40 +(– 4) = 336

Please note that students may use larger numbers or chunks once they are more confident with their understanding with number. Also, the recording of the numbers is to **explain** how they solved the problem and can look tedious. Many of the steps can be done **mentally** with some keeping track on paper if necessary.

It is important that students eventually learn to read all common notations, including both vertical and horizontal notations for addition, subtraction, and multiplication, as well as the various notations for division. However, they need to be secure enough to interpret these notations correctly while still relying on their own mathematically sound procedures to solve problems notated in any of these ways.*

For example:

2 + 4 = 6   32 – 27 = 5   5 = 32 - 27

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  2              32            12      12 x 7 = 84
 +4             - 27          x 7
  6               5            84
                                    6
24 ÷ 4 = 6    24/4 = 6     4)24
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Big 7 - looks like a big 7 (method of recording to keep track of subtraction and multiplication)

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7)293
  ~70    | 7 x 10 = 70
  223
  ~140   | 7 x 20 = 140
   83
  ~70    | 7 x 10 = 70
   13
   ~7    | 7 x 1 = 7
    6    |   41 R 6
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