ADDITION

328 + 245

Front end/Splitting both numbers

$$300 + 200 = 500$$
$$20 + 40 = 60$$
$$8 + 5 = \underline{\ 13}$$
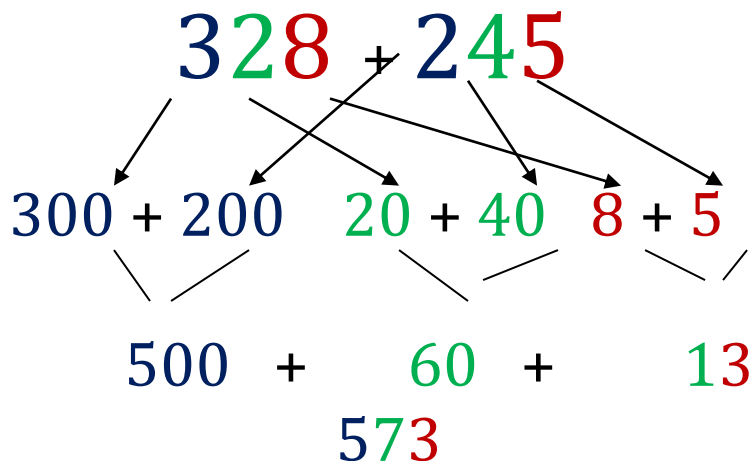$$\mathbf{573}$$

or

$$300 + 20 + 8$$
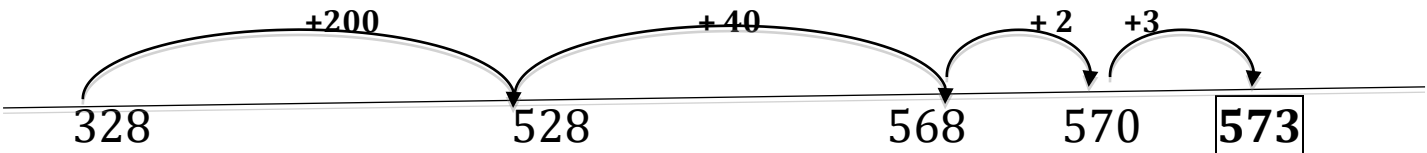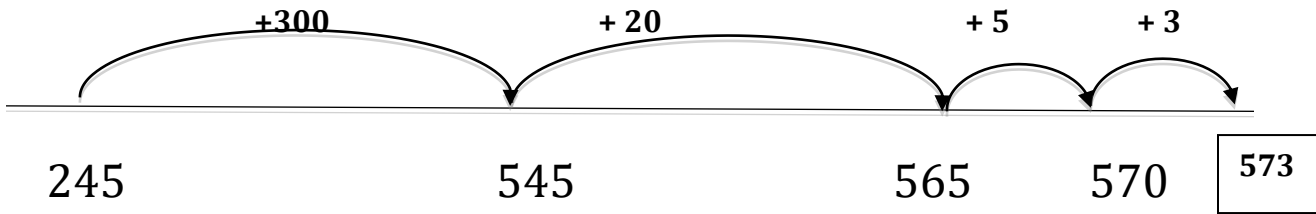$$+ \ \underline{200 + 40 + 5}$$
$$\mathbf{500 + 60 + 13 = 573}$$
$$(60 + 10 + 3)$$

$$328 + 245$$

$$300 + 200 \quad 20 + 40 \quad 8 + 5$$

$$500 \quad + \quad 60 \quad + \quad 13$$

$$573$$

$$328$$
$$+ \ 245$$
$$\ \ 13 \ \text{(add ones)}$$
$$\ \ 60 \ \text{(add tens)}$$
$$+ \ \underline{500} \ \text{(add hundreds)}$$
$$573$$

This strategy begins to build towards the "traditional" algorithm. We want students to understand that little raised 1 has a value of 10

$$\overset{1}{}$$
$$328$$
$$+ \ 245$$
$$\underline{}$$
$$5 \ 7 \ 3$$

1

Keeping One Number Whole, Taking Friendly Jumps (Shown on Open Number Lines)

```
        +300              + 20            + 5      + 3
   245              545           565      570    573
```

```
        +200              + 40        + 2    +3
   328              528          568   570   573
```

328 + 245

Remember, you can do smaller friendly jumps of 10
(Shown on Open Number Lines)

```
        +300           + 10      +10       + 5      + 3
   245            545        565        570    573
```

28 + 45

```
      + 10        + 10      + 5    + 3
   45        55        65    70    73
```

2
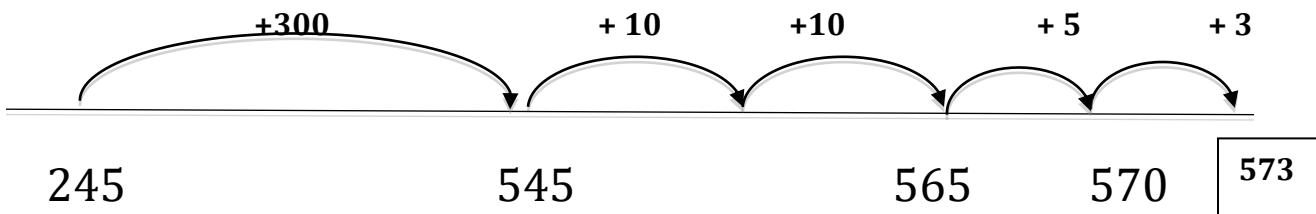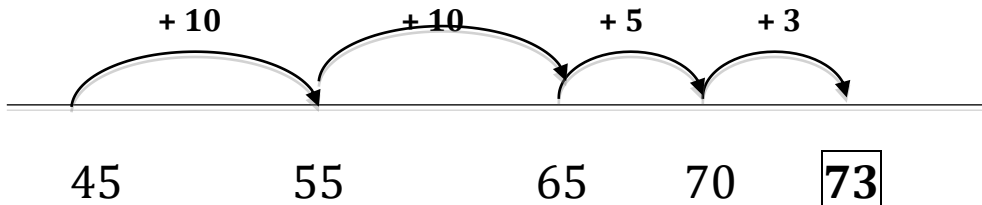
Compensation – **This is a good mental math strategy and demonstrates good number sense.**

$$28 + 45$$

For 28 + 45, think "I know **30 + 45 = 75**
I added 2 extra so I need to subtract them":
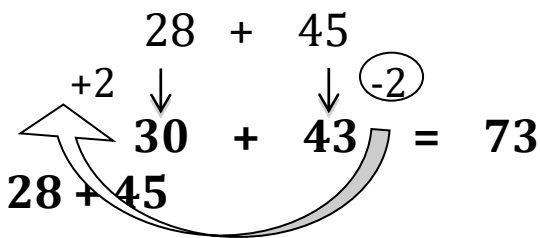**75 – 2 = 73**

You can do the same think for larger numbers
Example   328 + 245

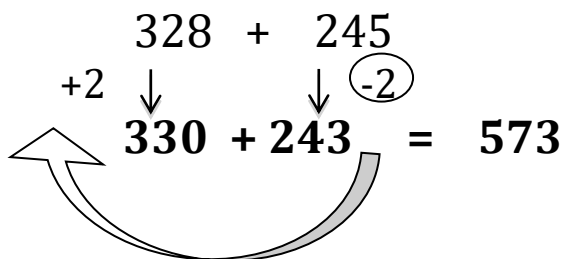**Think –** I know that **328 is close to 330.**
I know that **330 + 245 = 575**
but **I added 2 extra, so I need to subtract them.**
575 – 2 = 573

Another way to compensate   28 + 45

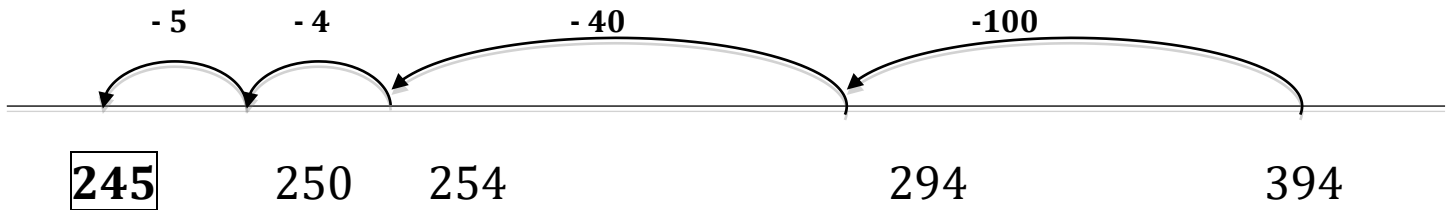Take 2 from 45 and give it to 28 to make a friendly number (30):

```
      28  +  45
 +2  ↓        ↓ -2
      30  +  43  =  73
28 + 45
```

Take 2 from 245 and give it to 328 to make a friendly number (330):

```
      328  +  245
 +2  ↓         ↓ -2
      330 + 243  =  573
```

SUBTRACTION 394 - 149

Keeping One Number Whole, Taking Friendly Jumps (Shown on Open Number Lines)

| - 5 | - 4 | - 40 | -100 |

245   250   254   294   394

Think addition: 149 + □ = 394

+ 1   +200   + 40   + 4   **245**

149   150   350   390   **394**
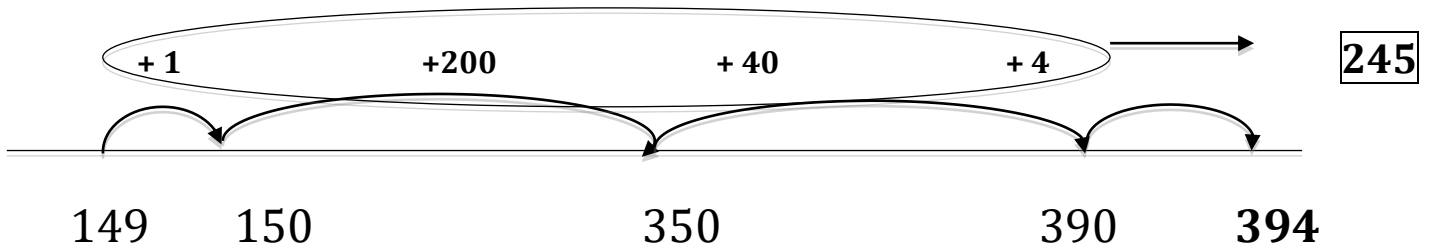
Splitting both numbers

394 – 149 : There won't be enough ones, so I'll split 94 this way:

```
  394  =   300 + 80 +  14
- 149  =   100 + 40 +   9   Now I can subtract
           200 + 40 +   5  =  245
```

4

394 - 149

Compensation

2 digit example:

For 94 - 49, think "I know **94 - 50 = 44**
I subtracted 1 extra so I need to add it back":
44 + 1 = 45

3 digit example:

For 394 - 149, think "I know 3**94 - 150 = 244**
I subtracted 1 extra so I need to add it back":
244 + 1 = 245

Constant Difference

This is a very powerful subtraction strategy. Why didn't they teach us this when we were kids? Why it works -- think about how old you were when your child was born. Each year, as you get older and your child gets older, the difference between your age and your child's age remains the same. By using the power of constant difference, you can avoid having to regroup for subtraction ☺ Remember, the change made to one number must also be made to the other number. You can either add or subtract to make it a friendly number.

Add 1 to both numbers to make a friendly number (150):

```
        394  -  149.
   +1  ↓       ↓  +1
       395  -  150    =  224
```

> Constant difference makes this an easier problem. Now you can just do front end subtraction – hundreds, then tens and then ones.