Lesson 2

Subtract Any Which Way Series

Why The Complement of the Difference Strategy Works

This is the quick guide to the video. For more complete details watch the "Subtract Any Which Way" video 2.

Goal

To explain WHY the "Complement of the Difference" strategy works.

A Brief Reminder

of how to USE

The Complement of the Difference Strategy

Take the Complement of the Difference

Example

85
- 6
79

The "Comp of Diff" Strategy:

Step 1: Note the end digits of the sum, "5 - 6" go below zero. It is "hard".

Step 2: Drop the 8 of "eighty" down to 7 for "seventy". (A carry process will occur).

Step 3: Find the difference between 5 and 6. It is 1.

Step 4: Take the complement in 10-circle of 1. It is 9. That is the last digit.

It will work with all examples,

but works best with numbers that are close together.

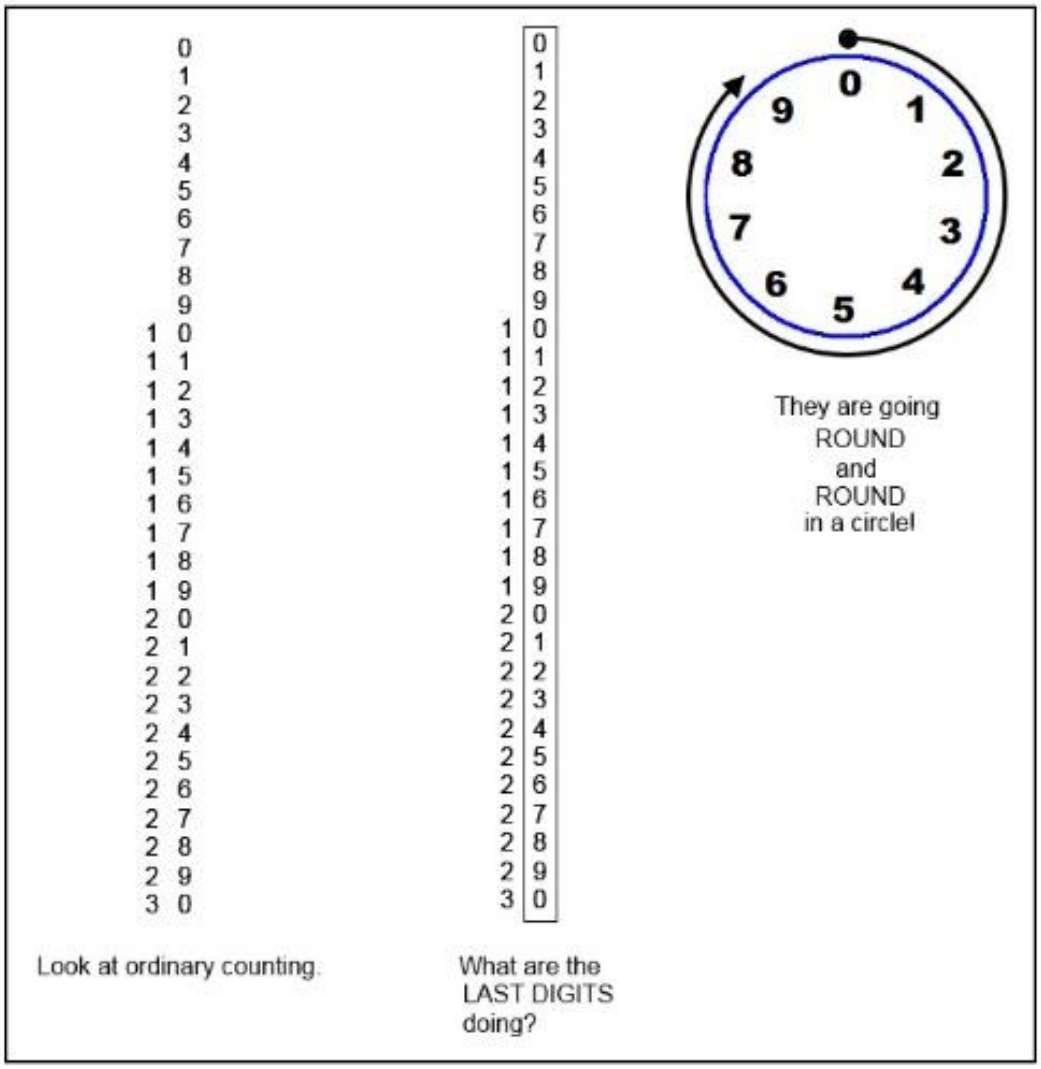
Now lets look at

WHY

the "Complement of Difference" Strategy Works

Below is a standard counting line. It just counts 0, 1, 2, 3... etc.

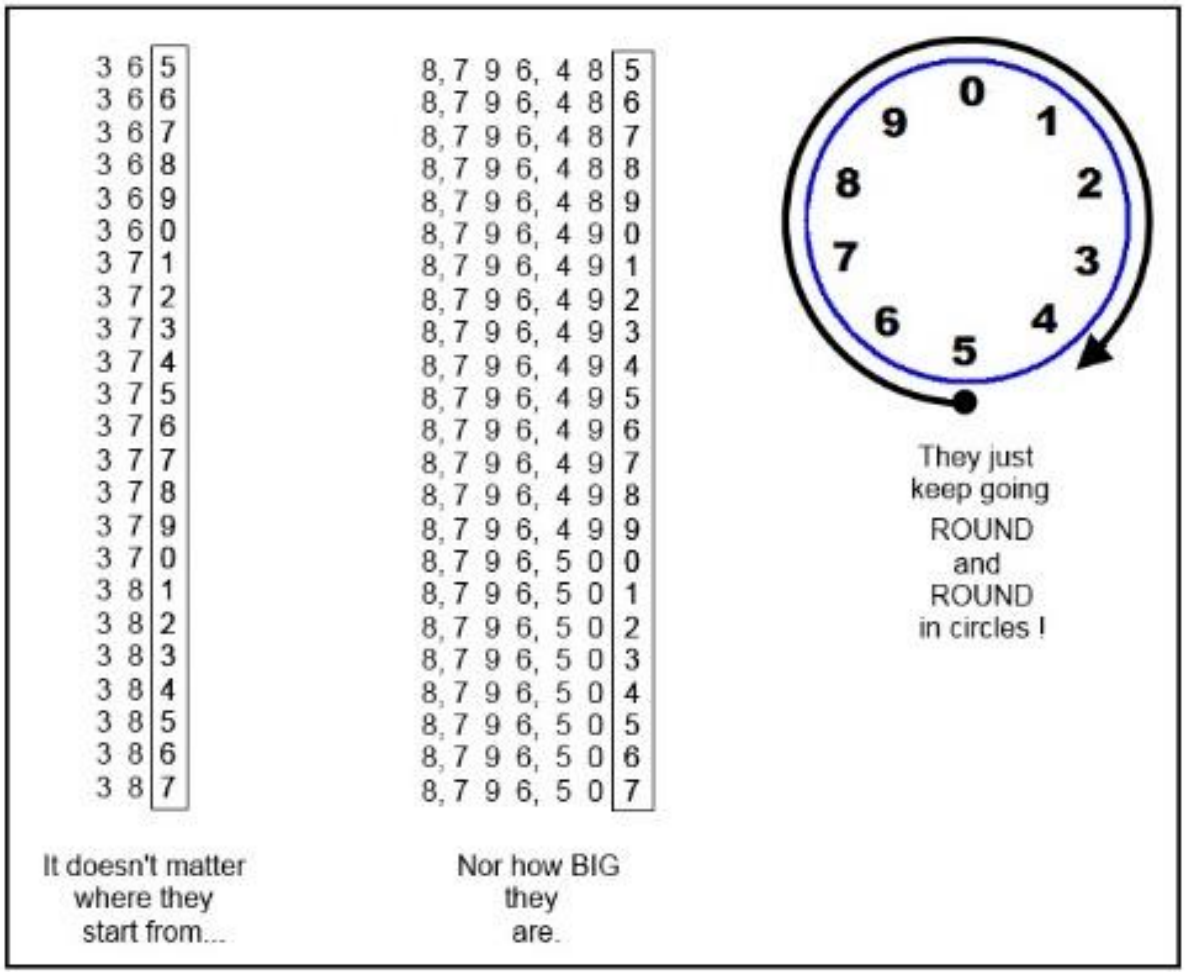
Look at the last digits in it for the pattern shown in the circle:



In the diagram below we started counting from 365 (any random number)

and again quite randomly from 8,796,485.

Notice that the circular pattern continues regardless of where we start or how big the numbers are:



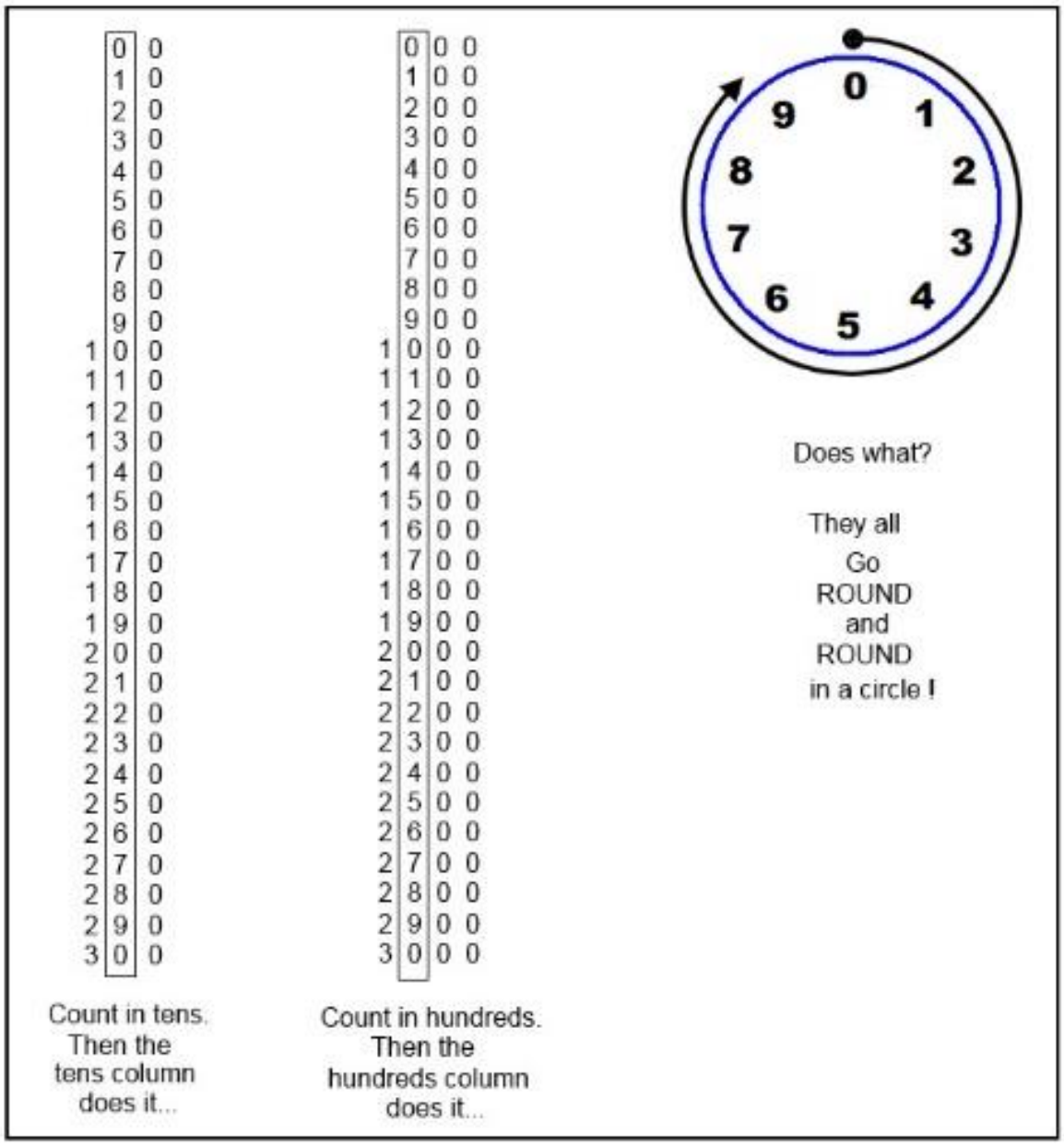
If we count in tens: 0, 10, 20, 30...

or if we count in hundreds: 0, 100, 200, 300...

it doesn't matter, the same pattern occurs.

The tens and hundreds columns

follow the same pattern (see below):



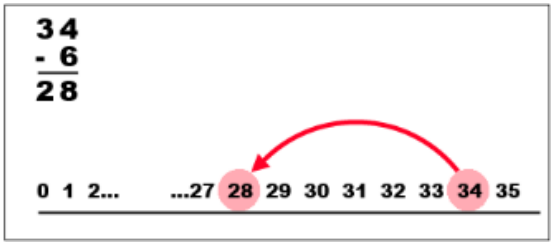
We've demonstrated

number is circular in its nature,

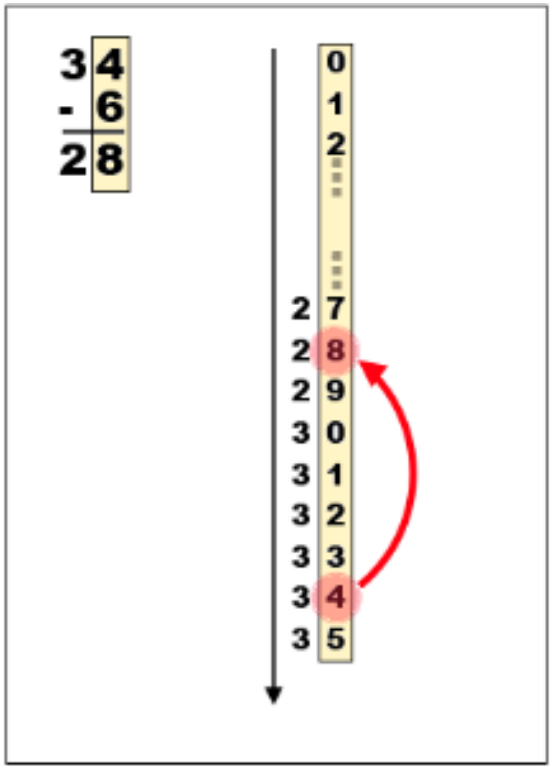
right from the start, at counting.

The key point for now is that 10-circle reflects what number does in the last digit.

Let's see how that works with an example such as 34 - 6 = 28:

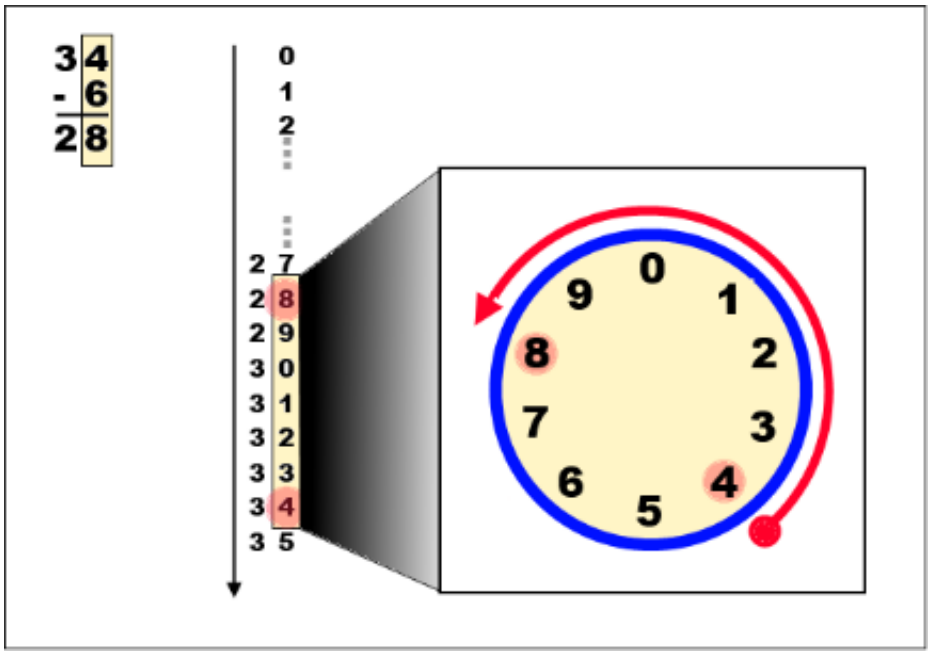


Redraw it so we can focus on the last digits only:



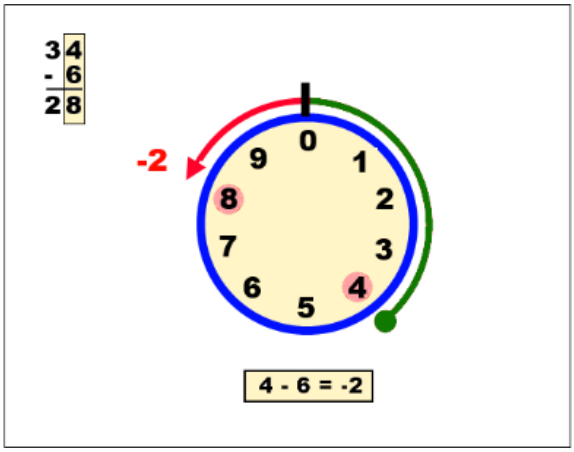
10-circle reflects what the sum is doing in its last digits.

Let's see it from the perspective (or frame of reference) of the 10-circle:



From the 10-circle's perspective, 34 - 6 collapses to 4 - 6,

which is -2 of course (see below):



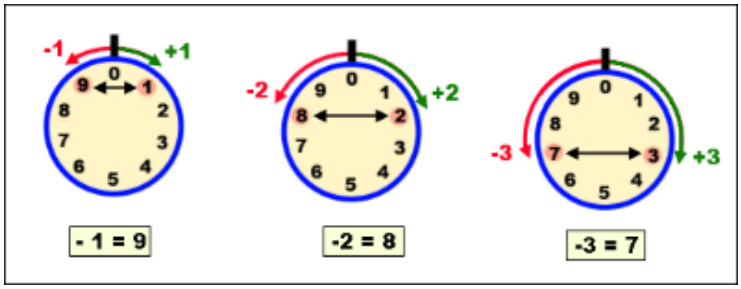
The **difference** between 4 and 6.

We take the minus into account by taking the **complement**.

As you can see on the page below

+2 comes to 2

but -2 comes to 8 (the ***complement*** of 2):



In a circular system

the complement of a number is its negative.

This is why the strategy is to take

the complement of the difference.

End Note:

You may also like to think of it this way: