# Number Puzzles

You need: a classmate

ACTIVITY

Room 12's teacher, Miss Parata, shows them a number puzzle.

**Think of a number:**
Multiply it by 2
Add 10
Subtract 6
Add 8
Halve the answer.

Tell me your final answer, and I'll tell you the number you started with.

"14," said Jane. "8," said Miss Parata. "WOW!" said Jane.
"9," said Mark. "3," said Miss Parata.
"10," said Tama. "4," said Miss Parata.
"27," said Elena. "21," said Miss Parata.

I've got it!
You subtract 6.

Yes, Hine.
But why does it work?

Let's use the letter *n* to stand for any of the starting numbers.
So what happens to *n* after each step, Hine?

Hine writes what happens to the starting number *n* on the board.

| | |
|---|---|
| Start with *n*: | *n* |
| * Multiply it by 2 | 2 x *n* |
| * Add 10 | 2 x *n* + 10 |
| * Subtract 6 | 2 x *n* + 4 |
| * Add 8 | 2 x *n* + 12 |
| * Halve the answer | *n* + 6. |


**1. a.** Use *n* to stand for any starting number to show how these puzzles work.

**i.**

**Think of a number:**
Add 22
Subtract 6
Multiply by 2
Subtract 8
Halve the answer.

**ii.**

**Think of a number:**
Multiply by 10
Subtract 8
Add 16
Add 2
Divide the answer by 10.

**iii.**

**Think of a number:**
Add 100
Multiply by 3
Subtract 294
Find a third of the answer.

**b.** Write your own number puzzles and see if you can show how they work, using the letter *n* to stand for any number. Try them out on a classmate.

**2.** Jenny starts with a different number for each of these number puzzles, but her answer is always 36. See if you can work out the number Jenny started with for each puzzle.

**a.**

**Think of a number:**
Multiply by 4
Add 12
Divide by 2
The answer is 36.

**b.**

**Think of a number:**
Multiply by 10
Subtract 40
Divide by 2
Add 6
The answer is 36.

**c.**

**Think of a number:**
Divide by 4
Subtract 10
Multiply by 8
Add 116
The answer is 36.

**3.** Write your own number puzzle in which you think of a number and get 36 for the answer. Get a classmate to figure out what number you started with.