Digit Chains

ACTIVITY

1. Mika makes a digit chain using a rule to change one number into another.

93 → 15 → 11 → 3 → 6 → 12 → 5
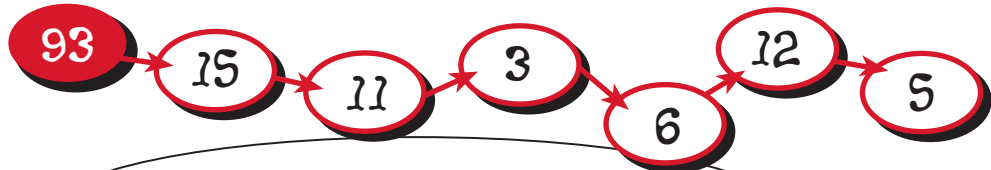
Hint: How can you use the digits 9 and 3 to make 15?
(Look at the rules in the questions below.)

a. Explain how Mika's rule works. Then use the rule to continue Mika's digit chain as far as it can go.

b. What happens to multiples of 19 when you apply Mika's digit rule? (The multiples of 19 are: 19, 38, 57, 76, and so on.)

> Note that 3-digit numbers can be written as tens and ones rather than as hundreds, tens, and ones. So 114 is 11 tens and 4 ones.
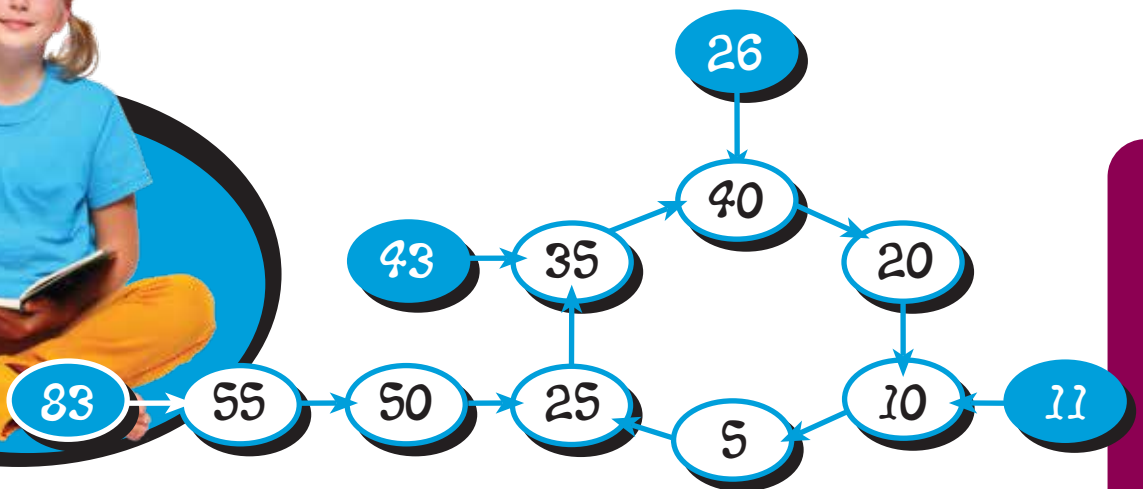
2. a. Make a digit chain for the rule below. Use a 2-digit starter number.

Triple the tens digit and add the ones digit.

b. Explain what happens in the digit chain.

c. Find out what happens when you use 3- and 4-digit starter numbers.

3. a. Zara draws a digit chain using this rule:

Multiply each digit by 5. Add the totals.

26 → 40
43 → 35 → 40 → 20
83 → 55 → 50 → 25 → 5 → 10 ← 11
25 ← 10
5 → 25

She looks at the digit chain and claims that all 2-digit numbers can be reduced to 5. Explain her reasoning.

b. Use multiples of 3 as starter numbers and check whether Zara is correct. Explain what happens.

4. Make up and investigate your own digit chain rules.