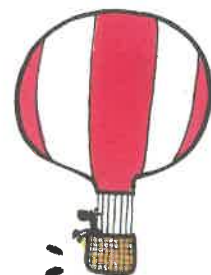


# Sequences

Algebra A9

Write the first six terms of these sequences. Start at the number given and use the rule shown.



1. 4 | 2, 2 8, 6 0, ...

1 add 2, then double

3 double, then subtract 1

5 multiply by 6, then halve

7 multiply by 10, then subtract 1

9 add 0.1, then double

2 subtract 1, then double

4 halve, then subtract 2

6 double, then add 1/2

8 multiply by 3, then add 1

10 subtract 0.3, then double



Sequences can make number chains.

**Rule:** If the number is even, halve it.  
If the number is odd, multiply by 3, then add 1.

Continue this chain starting at 6:  $6 \rightarrow 3 \rightarrow 10 \rightarrow 5 \rightarrow 16 \dots$

Describe what happens.

Explore chains made using this rule and starting with other numbers.

Put all the chains together on one diagram.



# The nth term

Algebra A10

Write these rules for shape number  $n$ .



1.  $6n$

1 6 times the shape number

2 double the shape number, then add 1

3 treble the shape number, then subtract 2

4 10 times the shape number, then add 1

5 5 times the shape number, then subtract 6

6 halve the shape number, then add 3

7 multiply the shape number by itself, then subtract 3

Write how many sticks are needed to make the tenth shape in each sequence.

8

10

12

14

16

9

11

13

15

17

Write the rule for shape number  $n$  in each sequence.