Frogs

My Maths Project

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How Does It Work?

▶ This is an investigation where you have for example 2 frogs on each side sitting on lily pads. One lily pad should be situated in the middle of the two sets of frogs.

▶ The aim of this investigation is to get the frogs on the left to the right, and the frogs on the right, on the left.

▶ To move, you have a slide and a jump. For the slide, you can only move one lily pad along. Whereas the jump is where you can jump over another colour frog to get to 2 pads along.
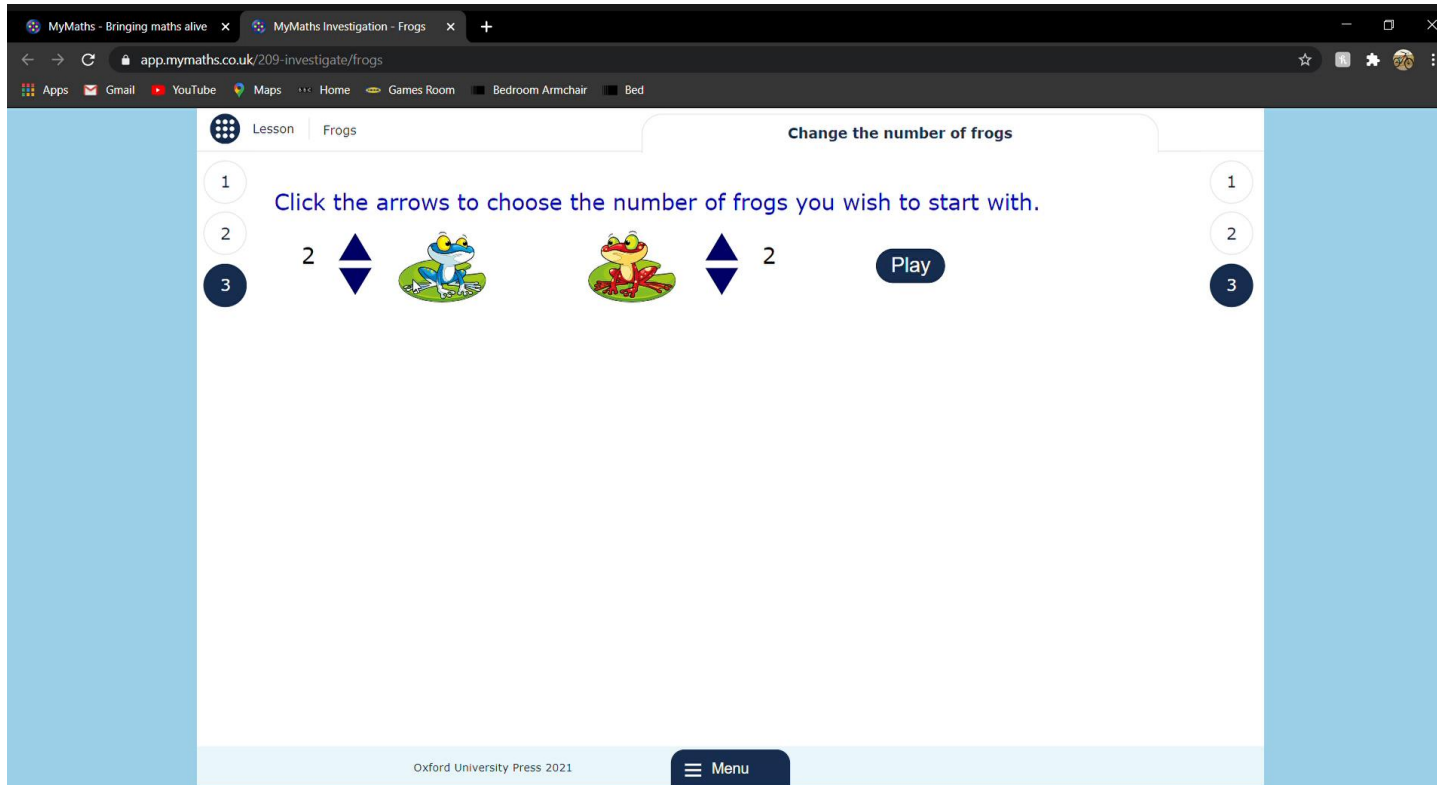
1 Frog on each side
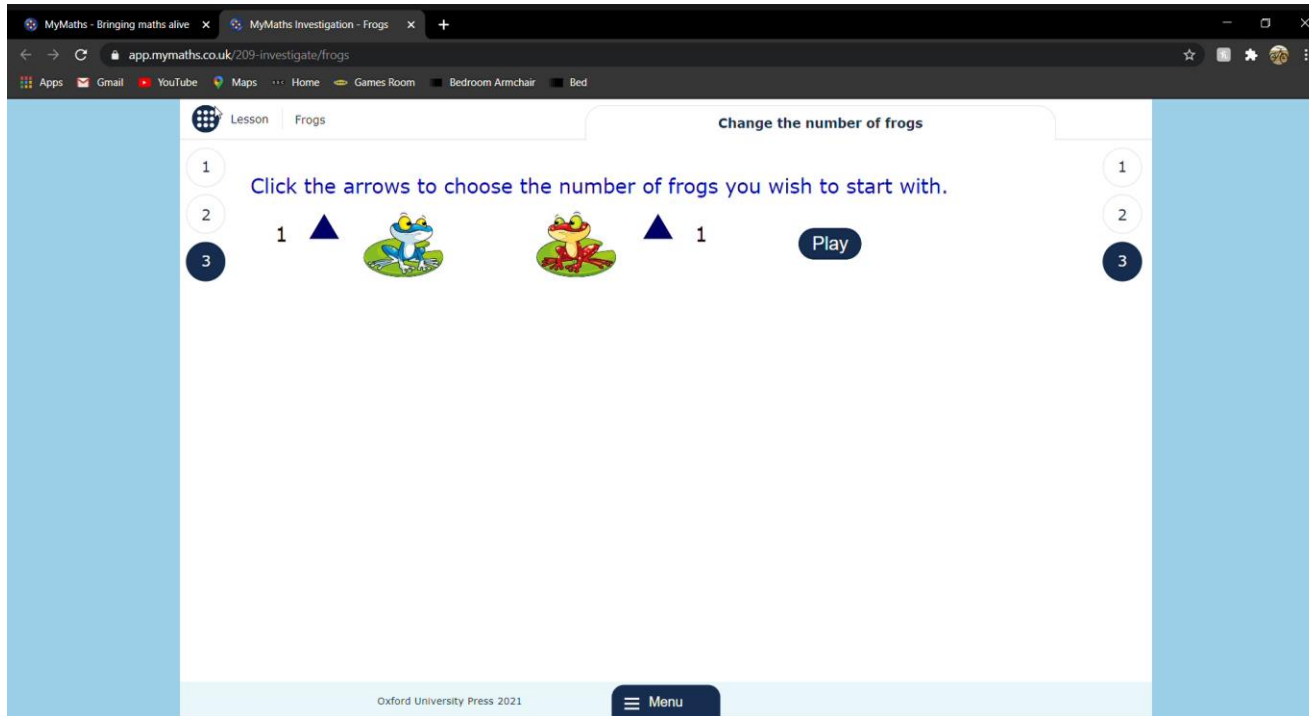
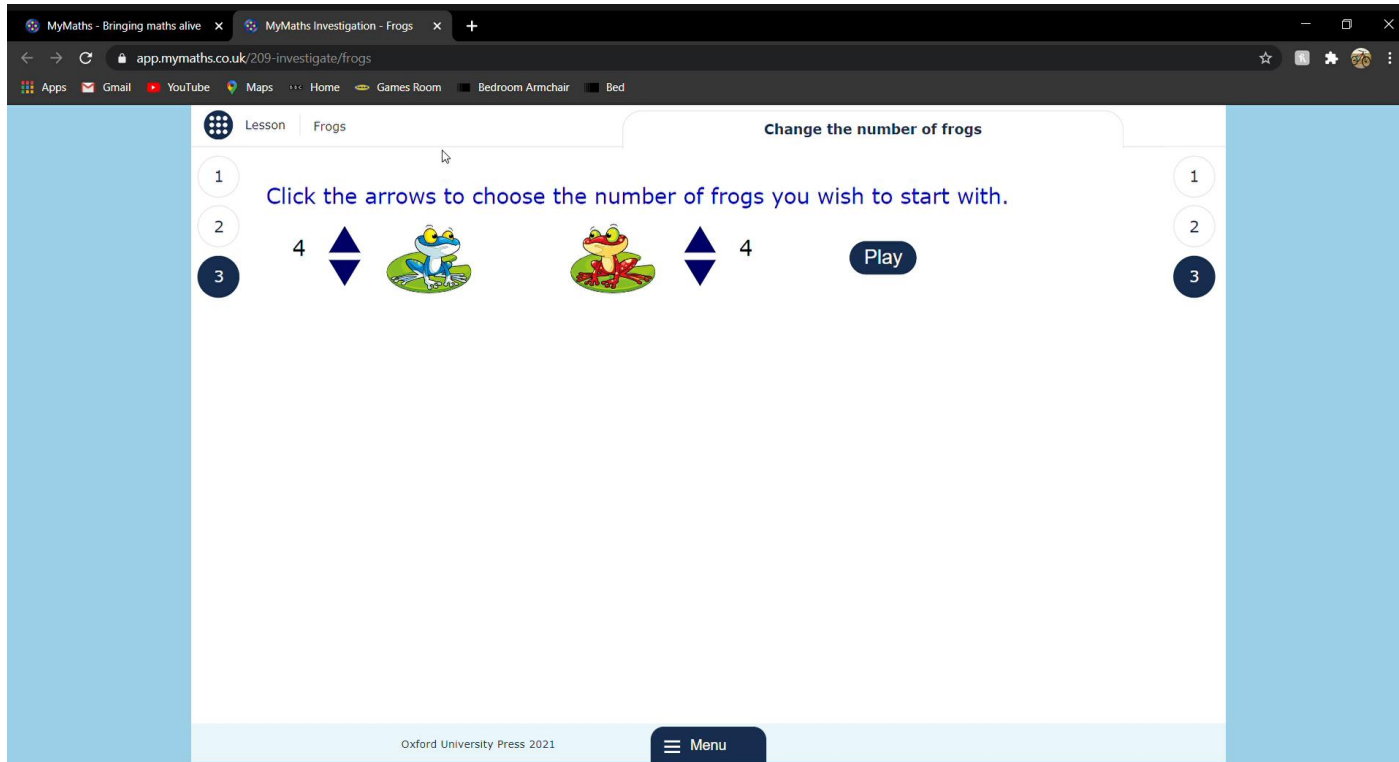3 moves
2 slides
1jump

2 Frogs on each side
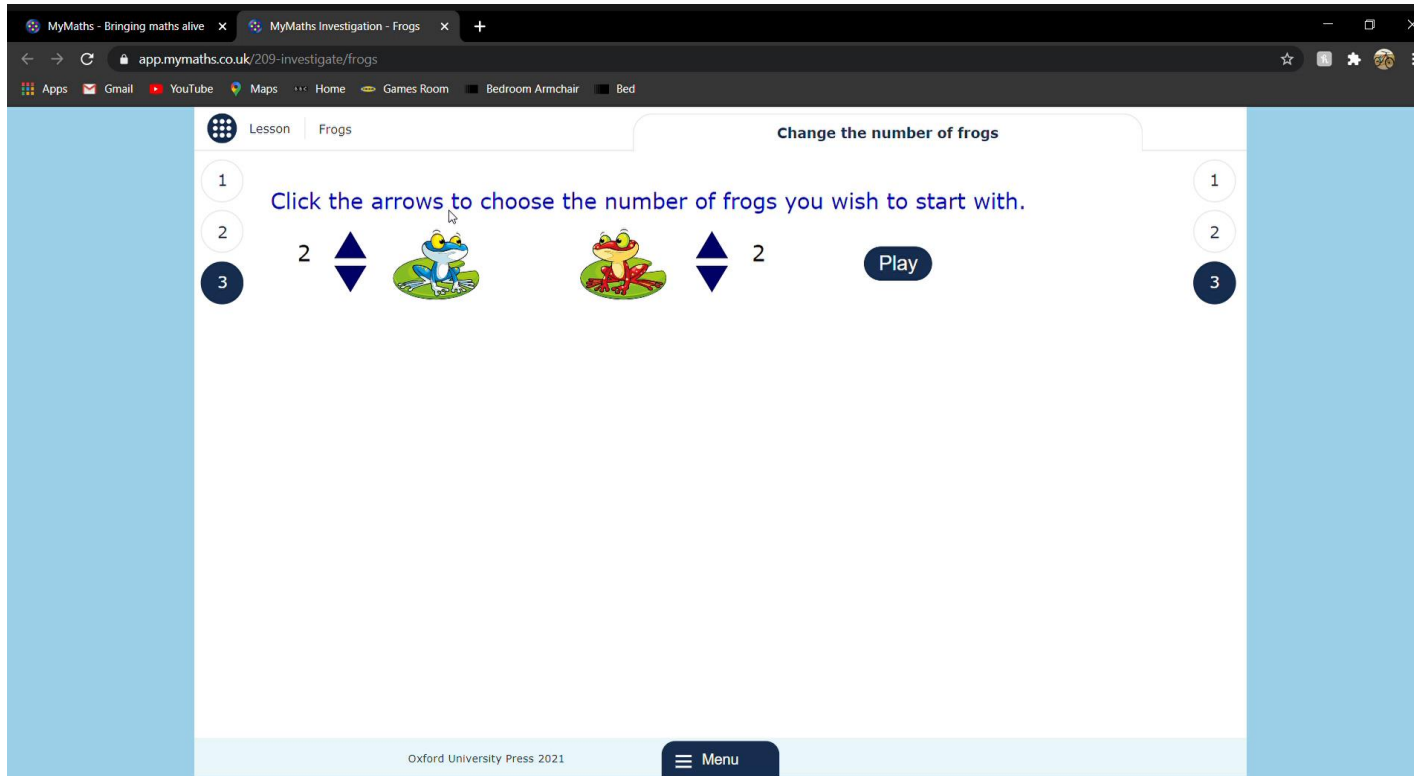
8 moves
4 slides
4 jumps

3 Frogs on each side

15 moves
6 slides
9 jumps

4 Frogs on each side
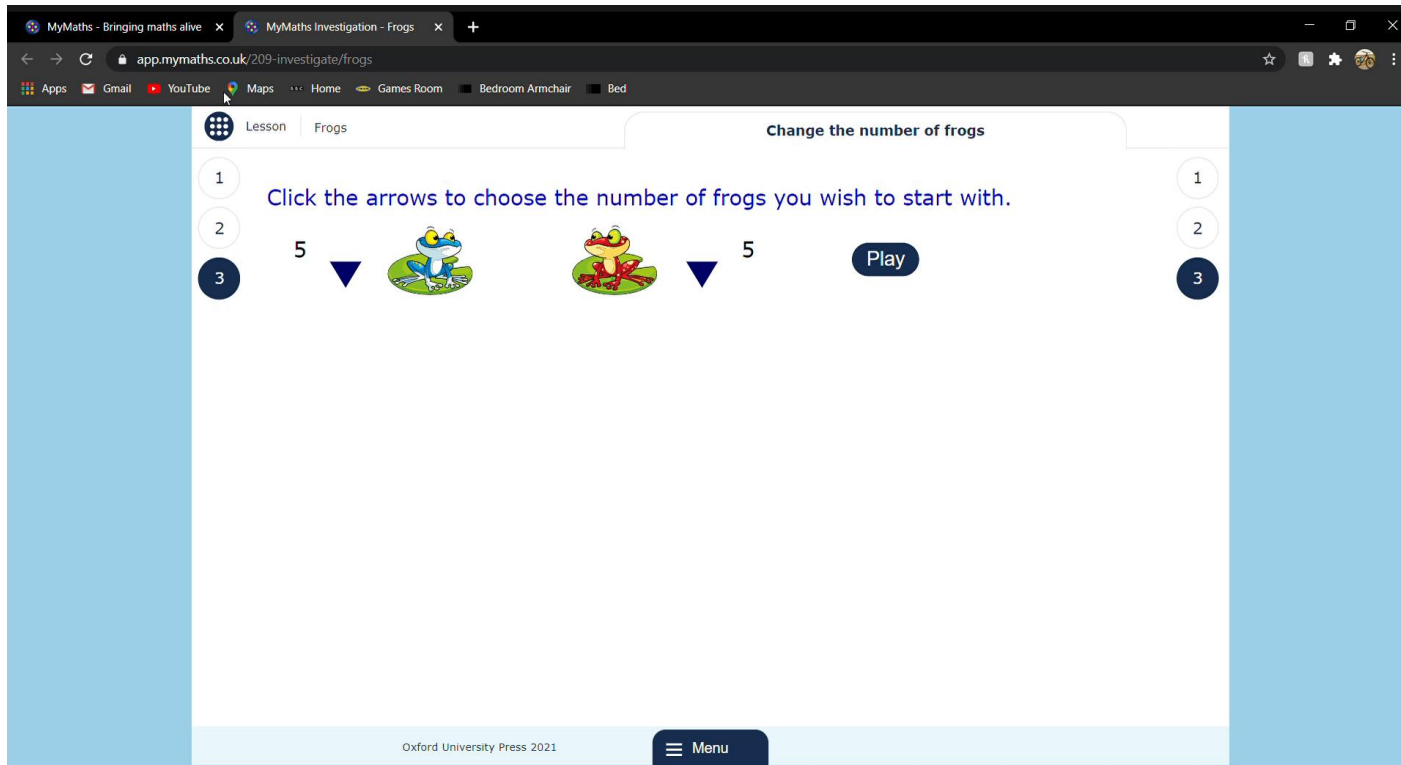

24 moves
8 slides
16 jumps

Results

No. of green frogs	No. of red frogs	Total no. of moves	No. of slides	No. of jumps
1	1	3	2	1
2	2	8	4	4
3	3	15	6	9
4	4	24	8	16
5	5	35	10	21
10	10	120	20	100
100	100	10200	200	10000
n	n	$(n^2)+2n$	2n	n^2

My prediction for 5 on each side

- My prediction is 35 moves in total, 10 slides and 25 jumps.

5 frogs on each side

35 moves
10 slides
25 jumps

Explanation

- To get the number of jumps you must square the number of frogs

- To get the number of slides you must double the number of frogs (e.g., 1 frog on each side. 1 x 2 = 2. 2 = no. of slides)

- To get the number of movements, add the no. of slides and jumps.

Algebraic Expression

- No. of moves : $(n_2)+2n$
- No. of slides : $2n$
- No. of jumps : n_2

100 frogs on each side

- Slides = 200

- Jumps 10000

- 10200

- I worked this out by doubling the number of frogs (100 x 2 = 200). Then squaring the number of frogs (100 x 100 = 10000). Finally, I added 10000 to 200 so I got 10200.
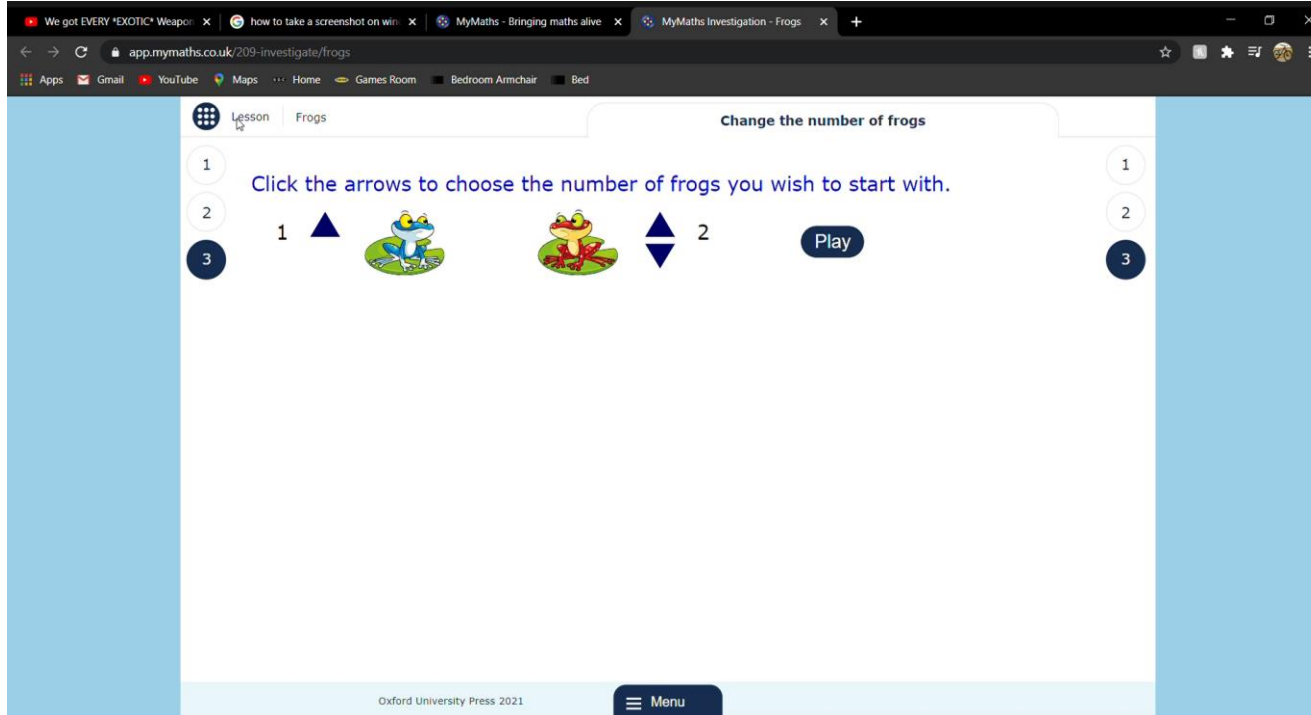
Extension Frogs

My Maths Project

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28/01/2021

How Does It Work?

▶ This is an extension of the investigation Frogs.

▶ In this extension, your aim is the same, but you start with for example 1 frog on one side and 2 frogs on the other.

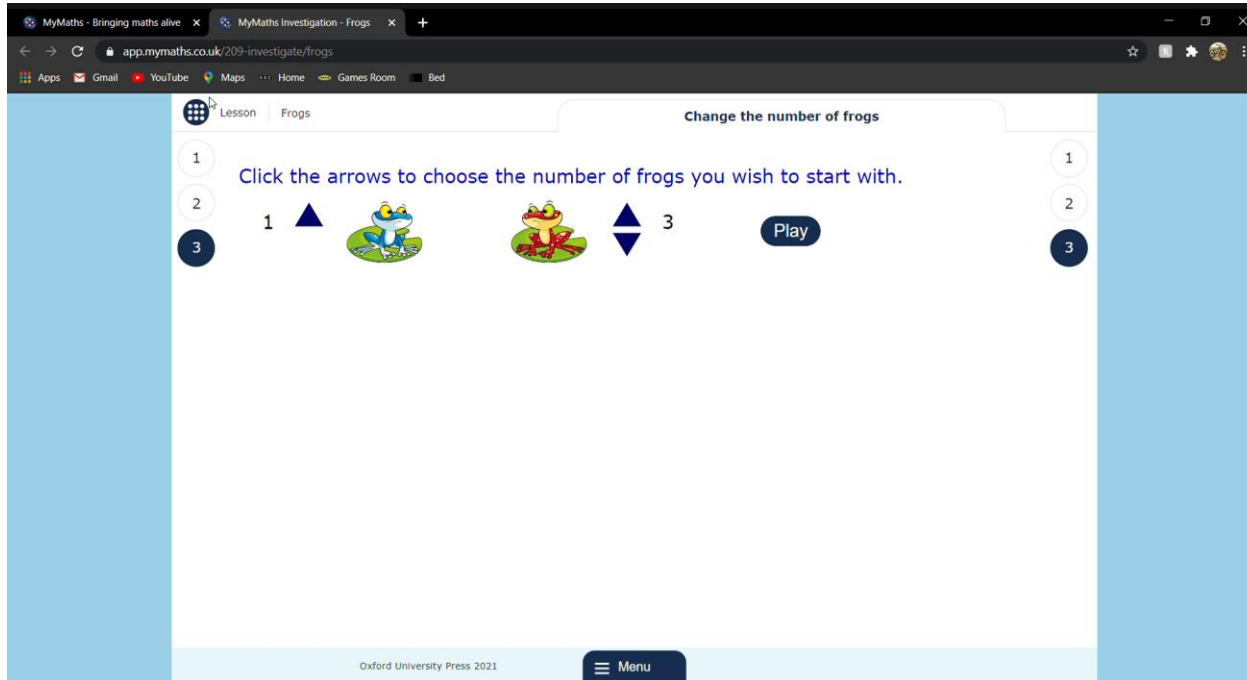▶ The rules are the same; you only have a slide and a jump to move.

1 Frog on one side and 2 on the other
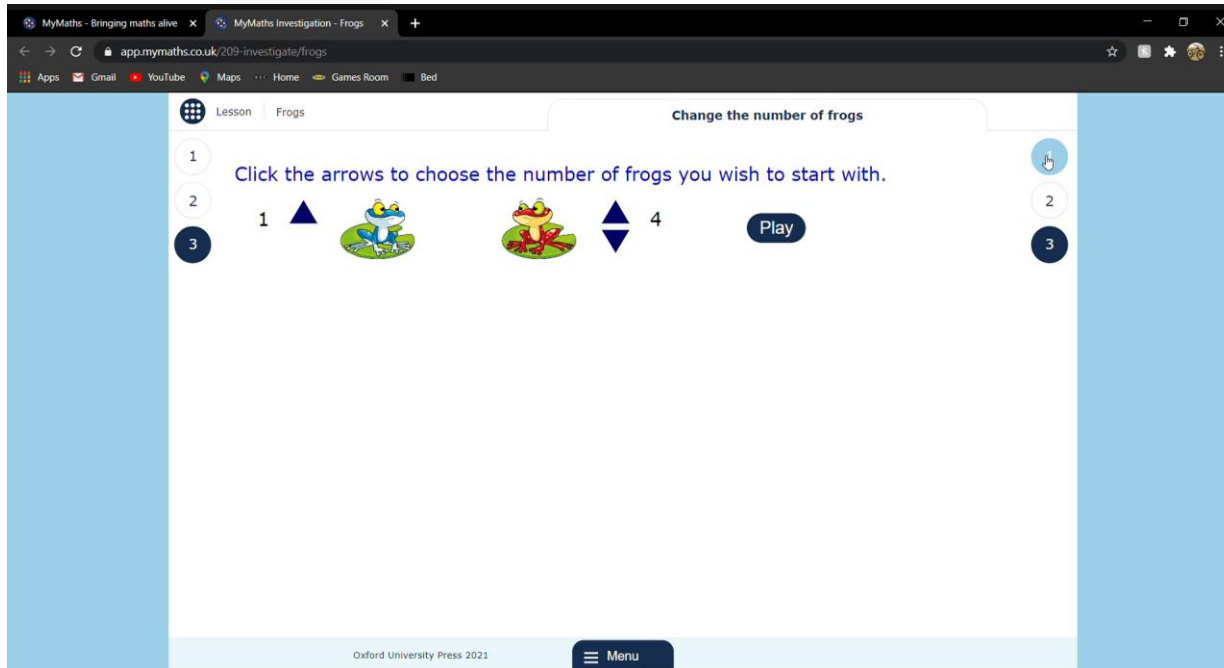

5 moves
3 slides
2 jumps

1 Frog on one side and 3 on the other
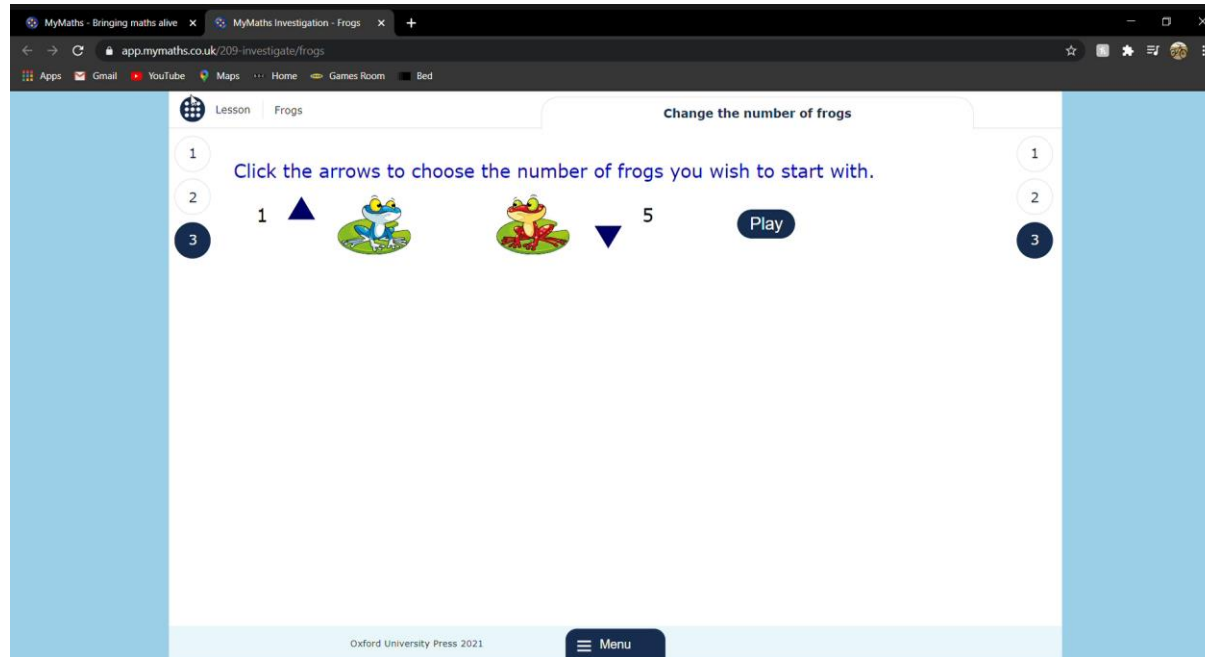

7 moves
4 slides
3 jumps

1 Frog on one side and 4 on the other

9 moves
5 slides
4 jumps

1 Frog on one side and 5 on the other

11 moves
6 slides
5 jumps

Table of results

No. of Green Frogs	No. of Red Frogs *	Total No. of Moves	No. of Jumps	No. of Slides
1	2	5	2	3
1	3	7	3	4
1	4	9	4	5
1	5	11	5	6

* = changing number of red
Frogs

Explanation

► To find out the number of moves you must multiply the changing number of red Frogs by two and then add 1. (2 x 2 + 1 = 5) 5 moves

► To work out the number of slides you must add the number of green to red frogs. (1 + 2 = 3) 3 slides

► To find out the number of jumps you must multiply the number of red and green frogs together. (1 x 2 = 2)

Algebraic Expression

- No. of moves = n x 2 + 1
- No. of slides = n + 1
- No. of jumps = n + 0

That's All For Now Frogs!☺