Maths Investigation

The flies are always tastier on the other side!

- There are two families of frogs – purple and blue.
- Each family contains 3 frogs.
- The purple frogs live on the left of the pond, the blue frogs on the right.
- The purple frogs want to get to the right side of the pond as they think the blue frogs get the juiciest flies.
- The blue frogs, on the other hand, think the purple frogs get fatter flies and want to get to the left of the pond.
- There are 7 lily pads which the frogs must use to cross the pond.
- Frogs can only jump to EMPTY lily pads.
- Frogs can only jump over ONE other frog at a time.
- Frogs don't know how to jump backwards!

Work out how the families swap sides. What is the smallest number of jumps they have to make to get there?

Now try…
- 4 frogs in each family with 9 lily pads
- 5 frogs in each family with 11 lily pads
- 6 frogs in each family with 13 lily pads

Complete the table:

Frogs in family (f)	3	4	5	6	7
Jumps (j)					

Can you see a pattern?

Use your pattern to work out how many jumps would be needed for 8 frogs in each family on 17 lily pads.

Write a general statement which explains how to work out the number of jumps (j) if you know the number of frogs (f).

Use your statement to work out the number of jumps for…

- a family of 11 frogs.

- a family of 15 frogs.

- a family of 50 frogs.

- 200 frogs altogether.

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- The blue frogs, on the other hand, think the purple frogs get fatter flies and want to get to the left of the pond.
- There are 5 lily pads which the frogs must use to cross the pond.
- Frogs can only jump to EMPTY lily pads.
- Frogs can only jump over ONE other frog at a time.
- Frogs don't know how to jump backwards!

Work out how the families swap sides. What is the smallest number of jumps they have to make to get there?

Now try…
- 3 frogs in each family with 7 lily pads
- 4 frogs in each family with 9 lily pads
- 5 frogs in each family with 11 lily pads

Complete the table:

| Frogs in family (f)	2	3	4	5
Jumps (j)				

Can you see a pattern?

Use your pattern to work out how many jumps would be needed for a family of 6 frogs on 13 lily pads.

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- The blue frog, on the other hand, thinks the purple frog gets fatter flies and wants to get to the left of the pond.
- There are 3 lily pads which the frogs must use to cross the pond.
- Frogs can only jump to EMPTY lily pads.
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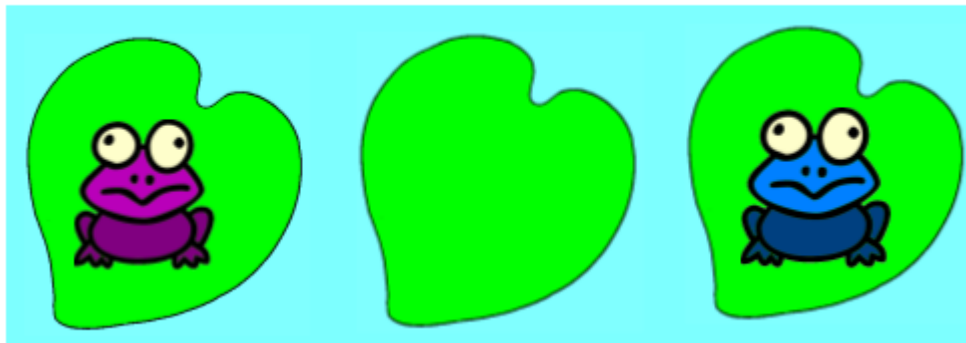
Work out how the frogs swap sides. What is the smallest number of jumps they have to make to get there?

Now try…
- 2 frogs in on each side with 5 lily pads
- 3 frogs in each family with 7 lily pads
- 4 frogs in each family with 9 lily pads

Complete the table:

Frogs on each side (f)	1	2	3	4
Jumps (j)				

What is the difference between the jumps for 1 and 2 frogs?

What is the difference between the jumps for 2 and 3 frogs?

What is the difference between the jumps for 3 and 4 frogs?

What do you think the difference would be for 4 and 5 frogs?

If there were 5 frogs, how many jumps would it take to cross the pond?