

Maths Investigation Frogs **Triangles**

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

Copy and complete the table into your yellow books:

| | | | | | |
|----------------------------|---|---|---|---|---|
| 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).

Extension: Can you write an equation using **f** and **j** that explains the pattern?

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.

Maths Investigation Frogs **Circles**

The flies are always tastier on the other side!

- There are two families of frogs – purple and blue.
- Each family contains 2 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 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

Copy and complete the table into your yellow books:

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

Can you see a pattern?

Try explaining the pattern using mathematical vocabulary. You might even be able to write an equation to describe what is happening. It will start with $j =$

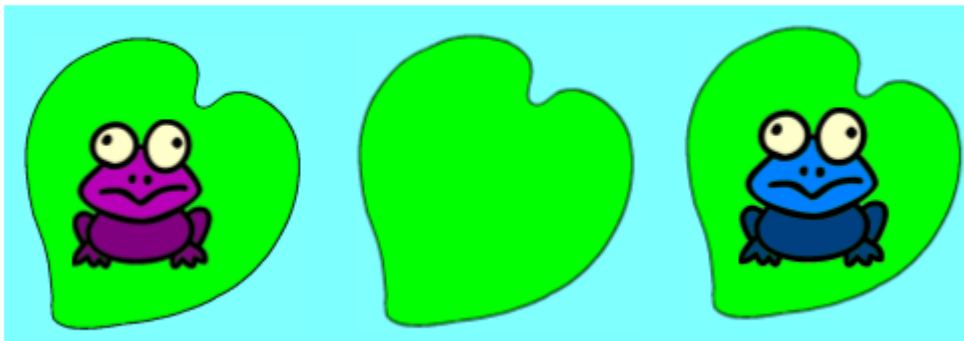
Use your pattern to work out how many jumps would be needed for a family of 6 frogs on 13 lily pads.

Mr. C's top-tip: If you're struggling at all, try using coloured counters or even coloured-in bits of paper and use these to help you with the counting.

Maths Investigation Frogs **Squares**

The flies are always tastier on the other side!

- There are two frogs – purple and blue.
- The purple frog lives on the left of the pond, the blue frog on the right.
- The purple frog wants to get to the right side of the pond as she thinks the blue frog gets the juiciest flies.
- 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.
- Frogs can only jump over ONE other frog at a time.
- Frogs don't know how to jump backwards!



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

Copy and complete the table into your yellow books:

| | | | | |
|-------------------------------|---|---|---|---|
| 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?

Have a go at explaining any patterns you see between the number of frogs and the number of jumps.

Mr. C's top-tip: If you're struggling at all, try using coloured counters or even coloured-in bits of paper and use these to help you with the counting. Alternatively, ask an adult to help you cut out the frogs so you can physically move them.

Make sure you have read the instructions carefully for this investigation. Ask an adult if you're unsure.