Peter.
Yr. 6.

Jumping Kangaroos

2. To show our answers we are using a table:

No. of Kangaroos on each side	1	2	3	4	5	6	7
No. of moves	3	8	15	24	35	48	63

3. We had a systematic way of moving the kangaroos you have to get green, brown, green and brown for you to get the kangaroos to the other side plus you cannot get 2 of the same colour next to each other or you won't be able to move. ✓

4. Each kangaroo moves more times each time you add two more kangaroos. ✓

PATTERN IN WORDS

Each time you add 2 more kangaroos the answer was the 2 more (in the difference)

Then we found another pattern, if you start without one kangaroo on each you times 1x3 with two on each side 2x4 and so on. ✓ Well done.

EXPRESS THE GENERAL PATTERN IN A NUMBER SENTENCE.

$M = K \times (K+2)$ ✓

TEST OUT MY RULE/NUMBER SENTENCE

$15 = 3 \times (3+2)$ ✓ $35 = 5 \times (5+2)$ ✓ $63 = 7(7+2)$ ✓

$24 = 4 \times (4+2)$ ✓ $48 = 6 \times (6+2)$ ✓

Great.

FUTHER EXPLORE THE PROBLEM.

To futher explore this problem we are going to have 100 kangaroos then 1000 and so forth on each side.

No. Of Kroos	100	1000	10,000	100,000	1,000,000
No. of Moves	10200	1002000	100020000	10000200000	1000002000000

EXPLAIN FULLY THE PROBLEM SOLVING STRATEGI USED

We used these strategies:

Look for a Pattern.
Write a number sentence.
Account for all ~~possibilities~~ possibilities.
Guess and Check.

CONCLUTION

During this project of JUMPING KANGAROOS Shane and I worked well together while finding all the answers and learning lots of things. Well done.

By Peter Riseley

Great report, Peter.

Jumping Kangaroos!

BY SING-PEY CHOW
7 BLUE (2)

THE PROBLEM (AIM) * to be able to find out the number of moves needed to make sure that each group of kangaroos can get to the other side.

Two groups of Kangaroos meet on a narrow mountain trail. There are three (3) going in each directions. Their challenge is to pass each other using the rules below.

* = one group of kangaroos.
☺ = another group of kangaroos.

RULES:

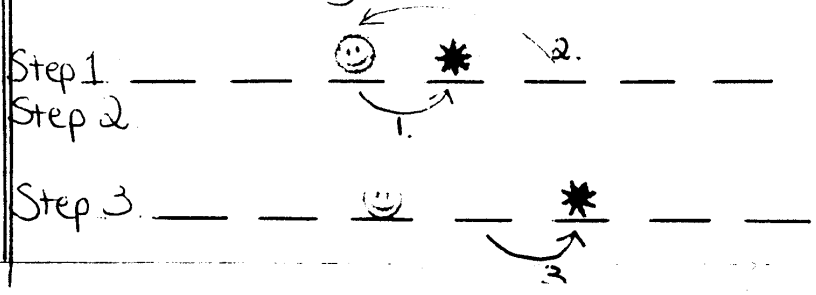
* only one kangaroo can move at one time.
* kangaroos can jump one space forward, never backwards.
* a kangaroo can jump over one on-coming kangaroo at one time and must land on an empty space.

2.

Number on each side	1	2	3	4	5	6	7
no. of steps/moves	3	8	15	24	35	48	63

* I used the counters as an aid and then wrote the results in a table as told in question 2. ✓

With one kangaroo on each side.



KEY
→ = *'s moves.
→ = ☺'s moves

With 3 kangaroos on each side:

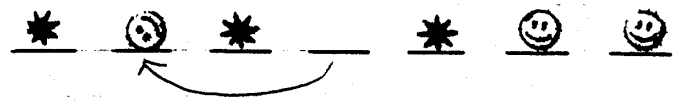
KEY as before

Step 1

Step 2.

Step 3.

Step 4.



Step 5.

Step 6.

Step 7

Step 8.

Step 9.

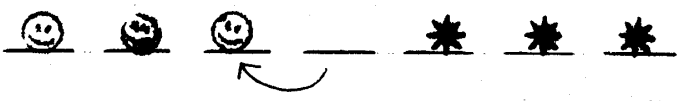
Step 10

Step 11

Step 12

Step 13. 

Step 14 

Step 15 

THE PATTERN:

For each added kangaroo on each side you add the same amount of difference from the previous one plus 2.

EG. 1 kangaroo on each side = 3 moves.
2 kangaroos on each side = 8 moves.
The difference between 3 and 8 is 5.

To find out the amount of steps with 3 kangaroos on each side without using counters would be:

* Take the difference from previous 2 numbers → 5
* Add 2 to the difference → 2 + 5 = 7
* Add the number you received from adding 2 to the difference and add to previous number of steps. → PREVIOUS NUMBER OF STEPS = 8
NUMBER RECEIVED FROM ADDING 2 TO DIFFERENCE = 7.
→ 8 + 7 = 15.

Therefore the number of moves needed for 3 kangaroos on each side is 15!

3. Are you using a systematic way of moving the kangaroos? Describe it so someone else could use it.

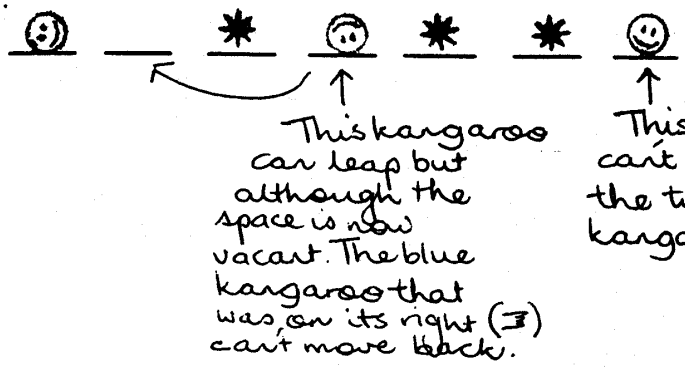
I always tried to have an opposing kangaroos faced each other.

EG. Step 9. (refer to)

This made things easier because a kangaroo could forward but not backwards. Sometimes I got stuck with two kangaroos of the same side and

neither of them could cross.

EG.



Knowing this, I tried to have opposing kangaroos face each other or a space.

4. What is a general way of describing the number of moves for any number of kangaroos?

I'm not sure if this is what you're asking for but how I worked my answers out was:

$$n \times (n + 2) = S$$

n = the number of kangaroos.
S = number of moves needed so that the kangaroos can pass.

To prove my method, I will take a number that I have already worked out... 3.

$n = 3 \rightarrow 3 \times (3+2) = 5$ ✓
$\rightarrow 3 \times (5) = 5 \longrightarrow 3 \times 5 = 15.$

5 · 15. (which is the correct answer.

STRATEGIES USED:

* Counting
* Drawing tables
* Drawing graphs.

* Subtraction (finding the difference.)
* Addition
* Multiplication
* Brackets
* Using letters to represent numbers. (Pronumerals / Algebra.)

SUGGESTED HYPOTHESES: (What I think is going to happen.)

I tried to find a pattern within the answers I already knew. (Question 2 table.) Then I looked for connections within the number of kangaroos and number of moves.

I thought that I would be correct and that the pattern was correct. It was!

CHECKING OF RESULTS:

I checked my results using the equation in QUESTION 4

CONCLUSION:

This problem was hard at first because I couldn't seem to figure it out. When I looked at the strategies used and compare it to all the ones I used in "double staircase", I found that most of them were the same! This problem wasn't as hard after I figured out the first few moves. It was a challenging problem and that's why I liked it.