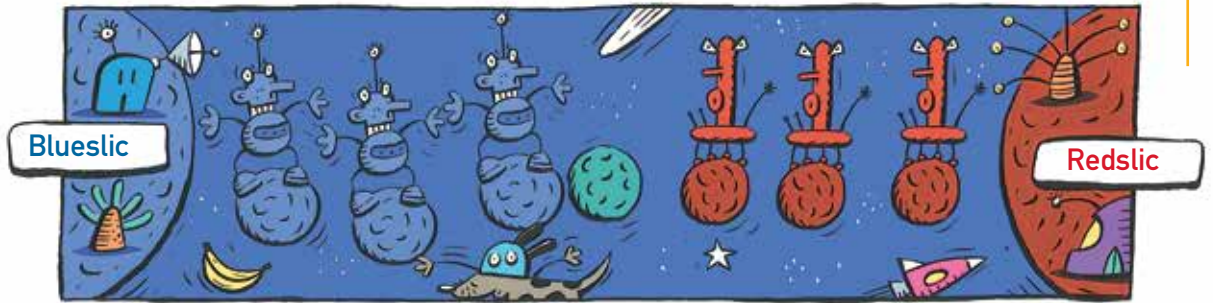


Alien Critters

You need: pegs or counters

ACTIVITY

6 alien critters are on a cosmic asteroid bridge with 7 asteroid stepping stones.



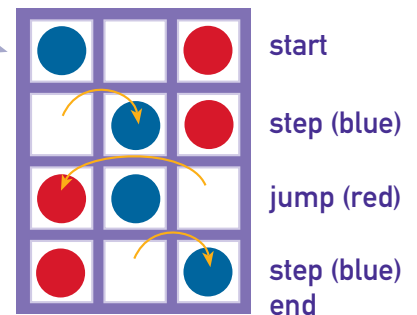
They need to swap places so that the blue alien critters are on the red asteroids and the red alien critters are on the blue asteroids. There is always 1 empty asteroid. The critters can step onto the nearest asteroid only if it is empty, or they can jump over another critter onto an empty asteroid. (They can jump over only 1 critter at a time.)



Reuben uses counters to figure out the minimum number of steps and jumps that the critters can make. This diagram shows what he found for just 1 blue critter and 1 red critter, with 3 asteroids.

- Use pegs or counters to help complete the following table.

Number of critters		Number of asteroids	Minimum number of steps	Minimum number of jumps	Minimum total number of moves
Blue	Red				
1	1	3	2	1	3
2	2	5			
3	3	7			



- Reuben thinks that a minimum of 8 steps and 16 jumps must be made when there are 4 blue and 4 red critters.
 - Why might Reuben think this?
 - Write a rule for the minimum number of steps and jumps for any number of blue critters and the same number of red critters.
- Find a rule connecting the number of each type of alien and the minimum number of moves.
 - What is the minimum number of moves when there are 100 blue and 100 red critters?