

# KS2 Numerical Reasoning using Counters



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**Activities and ideas to  
develop reasoning skills  
in the KS2 classroom,  
using counters.**





**1**

Nim 7: 2 players, Start with 7 counters. Each player can take 1 or 2 counters in turn. The winner is the player who takes the last counter. Is it best to go first or 2<sup>nd</sup>? Can children develop a winning strategy? Does the strategy work with other numbers of counters? Does it make a difference if an odd or even number of counters are used?

Use Number  
Facts and  
Relationships

**2**

Make Four. Give children a 7x6 grid and 20 counters of one colour each, e.g. one person is red and the other person blue. Players take it in turn to place a counter on the grid. The winner is the first person to get four of their counters in a row. Can children develop and explain a winning strategy? Does it matter if you go first or second?

Use Number  
Facts and  
Relationships

**3**

Give children a row of counters in a repeating pattern, e. g. RBYGR. Ask children prediction questions that would use their tables, e.g. The 30<sup>th</sup> counter would be Y, true or false? Explain.

Use Number  
Facts and  
Relationships

**4**

Give children 3 red counters and 3 blue counters  
Challenge children to move the counters to the other side in the least amount of moves. Counters can only be moved to an adjacent empty square or jump one counter to an empty square. Can children develop and explain a winning strategy? What is the smallest number of moves it can be completed in? Prove it.



Use Number  
Facts and  
Relationships

**5**

Put a container at the front of the class. If everybody in the class put in a counter, the jar would be  $\frac{3}{4}$  full. This can be extended with putting in different numbers of counters and using different fractions or simplified with fewer numbers of children. Another extension could be... If we all put in 1 counter the jar will be  $\frac{3}{8}$  full so if we all put in 2 counters it will be  $\frac{3}{4}$  full. True or false?

Fractions

**6**

Give children a pile of 42 red counters and 36 blue counters.  $\frac{1}{6}$  of the red pile is bigger than  $\frac{1}{3}$  of the blue pile. True or false?

Fractions

**7**

Show children a grid of counters of different colours e.g.  
Ask questions such as... $\frac{1}{3}$  the counters are green. True or  
false? If I changed the green  
counters for blue counters,  
 $\frac{5}{8}$  the counters would be blue.

blue	red	blue	red	blue	red
green	blue	blue	green	blue	green
blue	red	blue	blue	green	blue
blue	blue	blue	green	blue	red
green	blue	blue	blue	green	blue

Fractions

**8**

Give children a 4x50 grid and a red, blue, yellow and green counter. Red counters can move the number called, blue 3x the number called, yellow 4x and green 6x. Call out numbers between 1 and 5. Children move their counters, aiming to get all their counters to the end of the grid as close as possible, e.g. If the green counter crosses the line but the rest of the counters are still halfway - they lose. What strategies do they develop? Who can get all their counters to the end with the smallest gaps?

Use Number  
Facts and  
Relationships

**9**

I have up to 40 counters. If I count my counters in fours, I have 2 left over. If I count in sevens, I have 3 left over. How many counters have I got? (38)

Use Number  
Facts and  
Relationships

**10**

Give children 30 counters. Challenge them to share them between three of them giving each person an odd amount of counters. How many ways could they do it? Do you have them all? How do you know?

Use Number  
Facts and  
Relationships

**11**

Give children a blank 3x3 grid and 45 counters. Challenge them to place the counters in each square so each row and line totals 15.

2	9	4
7	5	3
6	1	8

Use Number  
Facts and  
Relationships

**12**

Give children a 5x5 grid and 10 counters. Each square can only have one counter. Challenge them to place the counters so that they have an even number in each row, column and main diagonal.

Use Number  
Facts and  
Relationships