

Trial and Improvement
On the farm

In the farmyard there are some pigs and some chickens. There are 87 animals and 260 legs. How many pigs are there in the farmyard?

When children first meet this type of problem they are often floored

The strategy to get them started is probably **guess and check**.

For example:

I guess there are 50 pigs so there are 37 chickens to make 87 animals.

A pig has 4 legs and a chicken has 2 legs

$$\begin{array}{l} 50 \times 4 = 200 \quad 37 \times 2 = 74 \quad (\text{using multiplication skills}) \\ 200 + 74 = 274 \quad \text{too high} \end{array}$$

Now employ a new strategy: **Guess and improve**.

Pigs have four legs so I need fewer pigs and more chickens. I'll guess 40 pigs so there will be 47 chickens.

$$\begin{array}{l} 40 \times 4 = 160 \quad 47 \times 2 = 94 \\ 160 + 94 = 254 \quad \text{too small} \end{array}$$

OK so now I know that there are between 40 and 50 pigs. I'll try 45 pigs so there are 42 chickens.

$$\begin{array}{l} 45 \times 4 = 180 \quad 42 \times 2 = 84 \\ 180 + 84 = 264 \quad \text{too high - but only just !} \end{array}$$

So I'll try one less pig. 44 pigs and 43 chickens.

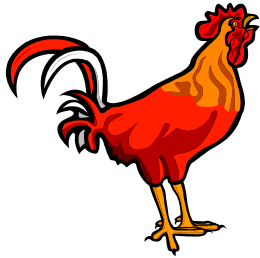
$$\begin{array}{l} 44 \times 4 = 176 \quad 43 \times 2 = 86 \\ 176 + 86 = 262 \quad \text{nearly there .. getting rid of one pig reduced the} \\ \text{number of legs by 2.....so one fewer pigs will give 260 legs} \\ (\text{recognising patterns}) \end{array}$$

So 43 pigs and 44 chickens.

$$\begin{array}{l} 43 \times 4 = 172 \quad 44 \times 2 = 88 \\ 172 + 88 = 260 \end{array}$$

There are 43 pigs and 44 chickens.

In the farmyard there are some pigs and some chickens. There are 87 animals and 260 legs. How many pigs are there in the farmyard?



So with this type of problem the answers can oscillate backwards and forwards until a solution is reached.

How do you find the total number of legs?

This establishes the understanding of multiplication

If we guess an answer and it is wrong does this matter?

Makes sure that children don't expect to be right first or second time and stick with it until they have a correct answer

How do you know if your answers are getting better?

Makes sure children record their answers and keep comparing to them to the target number