Problematised Situation 3: 47 Feet

This activity is based on the book “One is a Snail, Ten is a Crab” Read it to the students if you have it or simply use Slide 4 to introduce the problem asking questions such as those below.

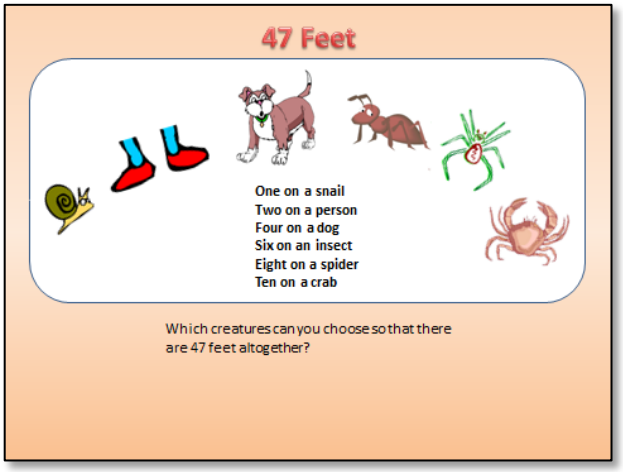
Sort out …

What is this problem asking you to work out?

How many feet on a snail/insect etc.?(Explain that a crab has 10 legs and that the front two have a second job as pincers)

Do you have to use one of each creature or can you mix it up a bit?

How many possibilities do you think you might be able to make?



Think about …

What strategies could you use to show your thinking for this problem? (drawings, numbers, tallies)

Would it be a good idea to just do snails? Why not?

What counting or adding strategies might be useful for this problem?

How will you know or be able to check that you have exactly 47 feet without having to count them all every time?

Action

Allow time for the students to create and check one or more possible solutions.

Sting

For students who quickly draw 4 crabs and finish easily, challenge them to make 47 feet without using any crabs at all. This will reveal whether or not rainbow facts (pairs that make to 10) are selected so that the counting in 10s is still a feature. Increase the number of legs, going beyond 100 if need be.

Reflect on …

Select 3 or 4 work samples that each show different speed counting, recording and solution strategies and project the samples so that they can be discussed and drawn over to show alternative strategies. For instance one might be set out in drawings but with no counting sequence attached. Use this as an opportunity to show how numbers can be used to help keep track of what number has been reached.

As each sample is shown ask the students to comment on:

"How does this strategy make it easy to see and check how many?"
"Does it matter what order we count these in? "
"Would there be an easier/faster way of checking the feet on this one?"

Finally ask:

"Which of the strategies used did you like the most? Why?" This could include, pictures, tallies, just using numbers, making rainbow pairs etc.
"Which strategy made it easy to check the answer? Why was that?"
"Which strategy would you like to try if you did another problem like this one?"

Indicators and Actions

Indicator	**Nudge**
Randomly counts creatures and feet one by one with no plan in mind and no numbers used to keep track	Prompt to see if the student can use numbers to keep track and note whether they can count on or whether they go back to the beginning. Prompt to see if they can count by 2s to speed up the count?
Draws creatures and uses numbers to say how many legs each has but not as a count.	Prompt to see if the students can count on and use the numbers to tell how many altogether so far.
Starts with a plan in mind, possibly drawing all 5 insects first but not having a plan for thinking about changing creature and counting sequence. Numbers used to keep track of the count so far.	Prompt to see if the student can think about what might be a good creature to use next and why, for instance a crab would speed things up and 10 is a friendly number, easy to work with.
Drawing 4 crabs and some other creatures based on place value knowledge of 4 × 10 = 40.	Prompt to see why the student drew the crabs and ask them how they could have used numbers rather than pictures to show the crabs, if 10 + 10 + 10+ 10 is suggested summarise as 4 lots of 10 and show how that could be written. It is important that we help students link repeated addition to multiplication.
Several efficient but random correct solutions based on number not drawings	Ask the student whether they need to begin from scratch every time or whether they could use an earlier solution to create a new one, for instance 7 can be all ones, a 2 and five 1s, a 4 and three 1s. 13 could be 10 + 1 + 1 + 1, or 6 + 6 + 1 and so on. Encourage systematic thinking and building on earlier working out.