

Mathematics Department Workshops

Topic: Place Value

Resource Sheet HT2.PLV.3- Place value hangman

In this activity the hangman game is adapted to encourage learners to 'use reasoning to work out the possible values of digits in addition calculations involving two numbers. The activity can be adapted to include numbers with more digits or the task can be set with a variety of digits already filled in.'

Reason the possible values that could be in an addition calculation involving two numbers. The activity can be adapted to include numbers of greater length or the task can be set with a variety of numbers already filled in.

Prepare a calculation that involves the sum of two three digit numbers.

Begin by dividing the class into two groups and write the following on the white board:

$$\begin{array}{r} * * * \\ + * * * \\ \hline * * * \end{array}$$

Ask a learner from each team to chose a number and guess a digit that may be present. If the digit is present then tell the team the place value it occupies. For example, an exchange might be:

"Is there a 1 in the first number?"

"Yes it is in the units column"

If the digit occurs more than once then every occurrence of the number is reported. If the number is incorrect then the hangman diagram is constructed in the usual way.

Play the game a couple of times to make sure all learners know the rules of the game.

Ask learners to think about how they could be certain that their suggestions are correct. For example, here

$$\begin{array}{r} 129 \\ 0 * 2 \\ \hline * 6 * \end{array}$$

We can complete the calculation by saying that the units column in the answer is 1, which would be our next guess. The 10s column in the second number must be 3 (taking the carry into account) which would be our next guess and the hundreds column in the answer must be 1 (because there is no carry) and this would be our final guess.

Play the game again, asking a member of each team to make a guess, maybe after consulting with their team members.

Now group the learners in pairs or in threes. One learner prepares an addition of two three digit numbers and the other plays hangman by asking if a digit is present in either of the numbers or in the answer.

The groups will soon encounter a situation where the addition produces a four digit number. Let the learners decide on a rule for what to do when this happens.

If this is challenging for some learners then the numbers may only have two digits or the numbers can be partially complete at the beginning of the game.

If a more challenging version is required then the numbers can have more digits or be decimal fractions.

At the end of the activity review the importance of place value and the ability to predict from the digits present.