

Mathematics Department Workshops

Topic: Place Value

Resource Sheet HT2.PLV.1

Display a diagram

Thousands	Hundreds	Tens	Units	.	tenths	hundredths	thousandths	ten thousandths
		4	3	.	7	6		

Ask direct questions such as:

- o What does the 7 represent? (seven tenths)
- o What does the 6 represent? (six hundredths)
- o What is the number? (forty-three point seven six **not** forty-three point seventy-six!)

In the next few rows of the grid, enter digits in various columns to write numbers, such as 0.0268 or 5098.3. Again ask direct questions about the values of the digits.

Remove the column headings.

Invite learners to show on their mini-whiteboards a number with a specific value in the **units** column (for example a number with four units). Choose a learner who has displayed a correct answer, for example, twenty-four point eight, and enter their number in the grid.

Now ask the learners to show a different number with the same number of **tenths** as the previous number e.g. seven point eight one five. Choose one of the learner's numbers and enter it in the next line of the grid.

Now ask learners to display a new number. It must have the same digits as the last one in the grid, that is, 7, 8, 1 and 5 but the digits must be in a different place and the number of **hundredths** must be the same e.g. seventy eight point five one. Choose one of the learner's numbers and enter it in the next line of the grid.

Continue fixing digits in different places and asking for new numbers, until all learners have entered a number in the grid. (You may have to start a new number sequence to achieve this.)

As a simplification you could use fewer columns. For example, you could focus on numbers involving only tenths, units, tens and hundreds.

As a challenge, write a number without column headings and ask questions such as:

Show me the result if you add seven tenths to this number.

Ask similar questions about increasing the value in a specific column.

After completing the activity with mini-whiteboards, you might like to repeat it completely orally and mentally, without writing any numbers at all.

Start again with a new number in the first row. Continue to use mini-whiteboards, but now ask learners to show you a number that is less than the original but with the same number of tens. Write on the board a selection of the correct answers that have been displayed. Continue to ask for numbers smaller than the original but change the number and vary the column that has to be kept constant.

Now ask for numbers greater than a number displayed on the board, using the same digits but with the same number of tens. Write on the board a selection of the correct answers. Continue to ask for numbers greater than the original but change the number and the column that has to remain constant.

Ask the learners to work in pairs to produce a rule that will work for choosing one number greater than or less than a given number. They might like to produce a poster and display their rule. The other pairs in the group can then try to produce counter-examples, to test the rule.

A variation on this activity might be to ask for numbers larger or smaller than a displayed number and to calculate the difference between the two numbers.