

Activities for Number Expanders

Activity 1: Expansions, expansions!

Students work in pairs and write their own decimal number on a number expander. They then write down as many expansions as they can. Expansions can be written in words and/or fractions, e.g. 0.342 is 34 hundredths + 2 thousandths OR $34/100 + 2/1000$. Groups could then swap number expanders and write down as many expansions as possible in a given period of time (say 2 minutes). At the end of this time, the new expansions are checked by the original group who made the number.

Activity 2: When do zeros matter?

Students work in pairs. Instruct them to write a number made of only 2 non-zero digits, with zeros written in all the other columns. They then swap number expanders with another group. All groups now try to *interpret* the number on the expander they have been given; writing the number on paper and deciding which zeros are essential, and which can be omitted. This activity is suggested because there are many special difficulties with zero, as explained throughout this resource.

Example: 0000.307000 may then be interpreted as 0.307

Activity 3: Multiplication and division by 10

Students work in pairs with 2 number expanders. On the first they write any number that has non-zero digits in the units and tenths columns. Ask them to show the expansion as a number of tenths. (For example: 2.6 would be expanded to 26 tenths). Then ask them to multiply the number by 10 (260 tenths). This result should be written on the second number expander (260 tenths) which is then (after rearrangement) seen to be 26.0, or 26. So 2.6×10 was found to be 26 by virtue of arithmetic of whole numbers!

Ask them to make up more examples for multiplication by 10, 100 and 1000 followed by division by powers of 10. (Note that the parallel division examples need zeros on the right of the number, so either they start with numbers like 50 or be prepared to annex zeros eg $4.5 = 4.50$)