Decimal division

Learning objectives
(Y5) Use/apply strand: Solve one- and two-step problems involving whole numbers and decimals and all four operations, choosing and using appropriate methods, including calculator use.
(Y6) Calculate strand: Calculate mentally with integers and decimals, eg U.t + U.t, TU × U, HTU ÷ U, U.t × U, U.t ÷ U.
(Y6/Y7) Calculate strand: Consolidate and extend mental methods of calculation to include decimals.

Expected prior knowledge
- Estimate multiplications and divisions involving one- and two-digit numbers.

You will need
Photocopiable page 59 (one per child); 0–9 spinners or dice (two per pair/group); calculators.

Key vocabulary
decimal, division, difference, product

Activity introduction

- Ask the children to give you two different whole numbers whose product is 100. Explore all of the possible answers, such as 1 and 100, 2 and 50, 4 and 25, and 5 and 20.
- Ask the children why there is no pairing with the number 3. Discuss with them the fact that 3 is not a factor of 100.
- Ask for some more pairs of numbers whose product is 100, if we allow any numbers (i.e. including decimals) to be used. Give them time to think and to discuss their ideas with each other. If you need to offer more support, suggest that they could begin with one of the earlier products, such as 5 and 20, and alter it. Useful products which can easily be formed using this method include 2.5 and 40, and 8 and 12.5.
- Conclude by drawing children's attention to the relationship between the pairs of numbers 4 and 25, and 8 and 12.5. Notice that one of the pair has been doubled and the other has been halved. The product remains the same.

Activity development

- Provide each child with photocopiable page 59 and hand out the spinners or dice needed to generate numbers. Since the challenge on the activity page has several rules, it may be worth going through them with the class to ensure that every child understands what they have to do.
- Go through the first example and ask all of the children to give a good estimate of 100 ÷ 3.7. Review the estimates offered by the group and then discuss strategies for getting close. For example, we know that 100 ÷ 4 is 25, so 100 ÷ 3.7 must be a little over 25. (The nearest whole number is 27.)
- The children should now be ready to play the game.

Review

- Invite some children to feed back to the whole class any strategies they used and found successful. Use these strategies as the basis of a discussion.
- In particular, focus on efficient ways to use known number facts to help with a difficult estimate or calculation. For example, we can deduce that a number between 4 and 5 will go into 100 between 20 and 25 times, since 100 ÷ 4 = 25 and 100 ÷ 5 = 20.

Next steps
- Discuss the relationship between pairs of numbers whose product is 100 and percentages. For example, if 4 × 25 = 100 then 4 × 25% = 100% = 1 and so 25% = 1/4.