

Can I make and justify decisions about when and how to use a calculator effectively to solve problems?

Teaching guidance

Key vocabulary

key, operation, inverse, trial and improvement, bracket

Models and images and resources

Overhead or whiteboard calculators

It is helpful to use an overhead or whiteboard calculator to demonstrate calculator methods to the class. It is particularly useful if the overhead calculator matches the calculators that children are using so that they can use exactly the same key presses that you do.



Slidey box cards

$$17.3 - \square = 8.8$$

Children need lots of practice in using inverse operations to find missing numbers. Slidey box cards can be used to stimulate discussion about missing numbers and to vary the part of the calculation which is hidden.

Sets of word problems

Apples weigh about 150 g each. Roughly how many apples would you expect in a 3 kg bag?

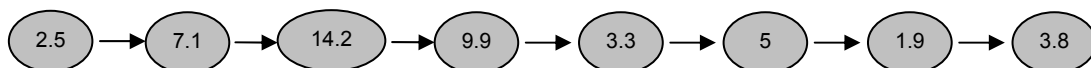
Amir buys a 5 kg sack of peanuts for £9.99. He measures out 150 g bags of peanuts and sells these for 65p each. How much profit will he make?

Coach fares from Oxford to London cost £13.50 for adults and £6.85 for children. How much would the total fare be for three adults and 12 children?

It is useful to have sets of word problems on card. Ask children to sort the problems into those that they would solve using mental methods, those they would solve using written methods and those they would solve using calculator methods. Ask children to compare their choices and justify their decisions to each other.

Teaching tips

- Give children opportunities to read word problems and to make a decision for each one about whether they would solve it mentally/using a written method/using a calculator. The focus of the activity needs to be on discussing and justifying the choice rather than just on solving the problems. A set of appropriate problems is provided via the Consolidation and practice section of this 'Can I...?' sequence on the CD-ROM.
- Children often underuse rather than overuse calculators. Encourage them to appreciate the calculator as an important mathematical tool. Discuss decisions about whether a calculator should be used for a particular problem as a whole class. Stress the need for efficient methods. There are many cases where children could work out a problem using mental or written methods, but this would take them considerable time. If they have a calculator to use, this may present a more efficient method.
- Ensure that opportunities to use calculators are presented regularly in mathematics so that children are used to selecting them as an everyday mathematical resource.
- Build opportunities to use calculators into daily mental and oral work:
 - Stepping stones. Children key the start number into a calculator then work out what operation to key in to make the number in the next stepping stone. They continue until they reach the end of the line.



- Zap the digit. Tell children a large or decimal number to key into their calculator e.g. 3126.57. They compare numbers. Then give children a digit you want them to zap e.g. the seven. They work out what number to subtract to remove the digit from the number replacing it with zero e.g. to remove the seven from the above number they would need to enter -0.07. Continue until the display shows 0. For extra challenge, ask children to remove two digits in one go, or to change the number displayed to a given number (e.g. 3136.77) with one entry.
- Give children missing number calculations such as: $29.6 \times \square = 1110$

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Overcoming barriers level 4–5

- Ensure that children have opportunities to use calculators to solve trial and improvement questions such as: Find the number whose square is 1369, without using the square root button!
- Ensure that children are aware that they need to make sure that measures are in the same unit before entering a calculation into a calculator. For example, when answering the problem 'How many 35p stamps can be bought for £5', they need to either convert the 35p into £0.35 and enter $5 \div 0.35$ or convert the £5 into 500p and enter $500 \div 35$.
- Make sure that children always estimate the answer to a problem before using a calculator. They should then check that the answer they have obtained is sensible.
- Make sure that children always reread the problem they are answering before deciding how to interpret the answer on their calculator display:
 - Children should take care when interpreting a display that represents money, knowing that for example an answer of 4.3 in pounds should be interpreted as £4.30 and that an answer of 4.356 would need to be rounded.
 - Children should be aware that they may need to round up or down the answer they obtain on their calculator display, depending on the context of the problem.