Spotlight 5: a learning check

Discards the remainder; does not understand its significance

Opportunity for: discussing, explaining and reasoning about numbers

Hand over the beans

Time 5–15 minutes

Resources

- Cubes
- Number lines
- Dried beans
- Bag to contain number cards
- Number cards 1 to 50 (Resource sheets 1, 2, 3 and 4)
- ÷ and = cards (Resource sheet 8)
- *Multiplication grid* (for example, Resource sheet 35)
- At least two players

Check: does the child use key vocabulary?

divided by
divided into
divided between
shared between
left over
remainder
hops of

Teaching activity

'We're going to play a game today called **Hand over the beans** to practise what we've learned about remainders.'

Use number cards to suit your children. You could have 12, 14, 15, 16, 18, 20, 21 in a bag and 2, 3, 4, 5, 6, 7, 8, 9, 10 on the table.

Some children might need to play the second variation of this game first if their knowledge of linking divisions to multiplication tables is not secure.

Put the bag with the larger numbers on the table, so the cards can't be seen, and put the 2, 3, 4, 5, 6, 7, 8, 9, 10 cards face up on the table and spread out (see variation on page 12).

How to play

1. Everyone starts with five beans. Someone will be bean banker and look after the rest of them.
2. Player 1 takes a card out of the bag, for example 15. They must select a smaller number from the table so that they can make a division calculation that does have a remainder. They can use cubes or number lines to work it out.
3. Player 1 must read and write their calculation and explain why they think they are right. If everyone agrees that they are right, they will win as many beans as there are in their remainder.
4. If the other players think player 1 is wrong in what they say or write, the other players can challenge them and must prove why player 1 is wrong. The other players can draw a number line, or look at the multiplication grid. If they do prove that player 1 is wrong, player 1 must give a bean to each of the other players!
5. The other players then take their turn to take a card from the bag and choose a smaller number from the face-up cards so that they make a division with a remainder.
6. The winner is the player with the most beans at the end.

? Can you explain to me why you chose that card to go with 21?

? How do you know you are right?

Variation

- Once the players have understood the game, help them to see that if they select their smaller number carefully, they can end up with larger remainders. For example, 15 ÷ 9 = 1 remainder 6, giving a much larger number of beans to win than with 15 ÷ 2 = 7 remainder 1.

? Could you have chosen another card to make your remainder larger?

? Could you change the number cards you play with so that you can make even bigger remainders?

- Put all the cards face down in two groups or piles. Take a card from each pile as the numbers to work with. (This is more reliant on luck but can also be quite a bit harder.)

This variation is an appropriate problem-solving task for a whole class.

- Play so that you don't have a remainder. If 18 is taken out of the bag, that player must choose 2 or 3 or 6 or 9 from the smaller numbers and make their division sentence, read it and explain it, showing that there is no remainder.

> 18 ÷ 6 = 3 and no remainder

If the player is right, they win a bean. If they are wrong, they must give a bean to each of the other players.

Learning outcomes

By the end of this set of activities children should be able to:

- tackle related learning tasks with increased motivation and confidence;
- use and understand connected mathematical vocabulary;
- understand a range of strategies to deal with remainders in real-life contexts;
- use a number line to show division and remainders;
- link a division calculation to a real-life example.