

Does not use partitioning to find double twelve or double thirty-five

Opportunity for: developing mental images

Resources

- Number cards 0–9 (Resource sheet 1)
- *Doubling cards* (Resource sheet 33)
- Counters/interlocking cubes
- Additional + cards (Resource sheet 8)
- Base 10 apparatus
- Place value cards (arrow) cards

Key vocabulary

- | | |
|--------|-----------------|
| double | multiply by two |
| equals | partitioning |

Teaching activity

Time 15–20 minutes

Explain to the child that this activity is going to help them to learn more about doubling and how to use partitioning to help with doubling.

Ask the child to double small numbers below five. Record the doubles that they recall, for use later.

Double 1 = 2
Double 2 = 4

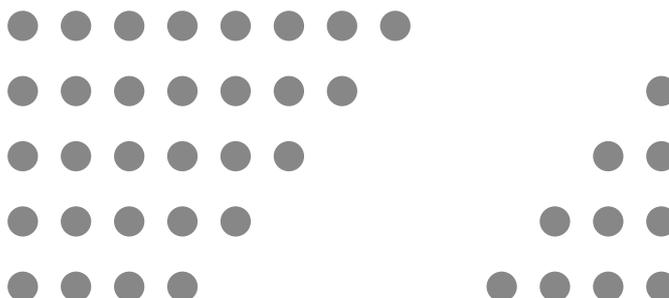
? Can you double eight?

? How did you do it?

If the child uses partitioning strategy, repeat for other numbers below ten, then move on.

If the child does not use partitioning, but counts on from eight, explain that you are going to work on learning other ways of doubling numbers so that the child does not always need to count on to work out a double.

Provide counters or interlocking cubes and ask the child to show you all the different ways in which they can make eight. Ask the child to find all the possible ways of adding two numbers to make eight and lay them out on the table:



Then ask the child to match digit cards to each set: $8 + 0$, $7 + 1$, $6 + 2$, $5 + 3$, $4 + 4$.

Explain that you are going to work together, using these partitioning facts to double eight.

Show double eight with eight counters partnered by another eight:



Use this layout of counters to illustrate how double eight is equal to, say, double five plus double three.

? You know that four and four equals eight. How could you use this number fact to help you find double eight?

Ask the child to illustrate their calculation as double four and double four again, using the counters to show their thinking.

Repeat this activity using other partitions of eight to find double eight.

? Which was the easiest number fact for you to use in partitioning to find double eight?

? Why was this easiest?

Use the child's answers to these questions to reinforce that they can choose any way of partitioning the number they have to double, using number facts that they know.

Repeat the activity with numbers between five and ten, other than eight.

If the child needs reinforcement of doubling numbers below ten using partitioning, repeat the activity above for a range of numbers between three and ten. Ensure that the child has the opportunity to comment on the fact that the different partitionings of an individual number all yield the same double.

Spotlights 1 and 2 provide further contexts for doubling numbers up to ten using partitioning.

? What is double ten? What is double two?

? Can you tell me what double twelve is?

If the child is able to make use of this partitioning to double twelve, ask them to choose another number between ten and twenty and use counters/cubes, or a diagram which they create, to show how they partition to calculate double their chosen number.

If the child has difficulty working out double twelve, use interlocking cubes or Base 10 apparatus to partition teen numbers into ten and ones. Use place value cards to label each group. For each number, ask the child to make the pattern twice, so that they have a visual picture of the doubles. Match cards to these groups as well.

Combine the tens groups.

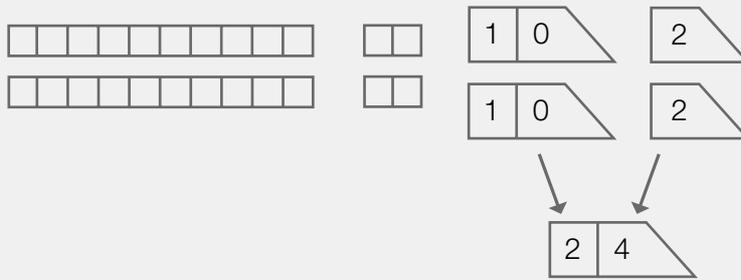
? Which arrow card can we replace the two tens with?

Combine the ones groups.

? Which arrow card can we replace the two twos with?

Then combine the groups of apparatus to illustrate twenty-four and the arrow cards to label twenty-four.

continued



? What number have we doubled?

? How can you find double twenty-three?

Offer the child Base 10 apparatus and place value cards to help them illustrate the process they use to find double twenty-three.

If the child cannot extend the process to numbers above twenty, help them to make a link to their success with numbers up to twenty and then choose a range of numbers between twenty and thirty to partition into the 'tens' and 'ones' parts, using place value cards to illustrate the process.

Ask the child to choose numbers to partition and double.

? We did something very special today to find doubles. Can you tell me what we did?

Spotlight 1

Does not use partitioning to find double twelve or double thirty-five

Opportunity for: reasoning about numbers

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Handy fingers

Time 10–15 minutes

Resources

- Dice numbered 5–10
- Number cards 0–10 (Resource sheet 1)
- Mirror

Key vocabulary

| | |
|-----------------|--------|
| double | twice |
| multiply by two | equals |
| plus | |

Teaching activity

Explain to the child that this activity is going to help them to learn about using their fingers to help them double.

Ask the child to throw the dice and show the number on their fingers, with five on one hand and the rest of the number on the fingers of the other hand, for example, five on one hand and three on the other.

? What number sentence are you showing me?

Repeat until the child is confidently showing and saying a 'five plus something' sentence each time, for example, 'eight is five plus three'.

Ask the child to choose a number card and show the number on their fingers with five on one hand.

? Now can you double the number?

Ask the child to hold their hands up to the mirror so that the number is represented twice.

Point out that the five can be seen twice, as can the other number, say three.

? How many fives can you see? What is double five?

? How many threes can you see? What is double three?

? So what is double eight?

Repeat this activity for all the numbers in the pack, removing the mirror when the child thinks they can manage without it.

Continue until the child can double using only the model of their own fingers and imagining the double.

? How does using your fingers like this help you to double?

? Do you think you could practise this at home so that you learn some doubles by heart?

Spotlight 2

Does not use partitioning to find double twelve or double thirty-five

Opportunity for: making decisions

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Double time

Time 10–20 minutes

Resources

- Number cards 0–10 (Resource sheet 1)
- Sand timer

Key vocabulary

| | |
|-----------------|--------|
| double | add |
| multiply by two | plus |
| partitioning | equals |

Teaching activity

Explain to the child that this activity is going to help them to learn about doubling numbers up to ten.

Give the child the 5 card. Spread the 1, 2, 3 and 4 cards face down for the child to choose another card at random to add to the 5 card.

? What is the total of your two cards?

Give the child the number card that represents their total and lay it on the table with the other two cards, for example:



? How can you work out double the total?

Support the child in doubling the five and doubling the other number in order to find double the total.

Repeat with other cards drawn randomly to accompany the 5 card.

If the child can recall quickly how to work out doubles, challenge them to beat their own time against a sand timer, doubling as many numbers as they can before the sand runs through.

? What do you think you are really good at now?

? What would you like more help with?

Spotlight 3

Does not use partitioning to find double twelve or double thirty-five

Opportunity for: reasoning about numbers

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Double time again

Time 10–15 minutes

Resources

- Number cards 0–20 (Resource sheets 1 and 2)
- Sand timer

Key vocabulary

- | | |
|-------------------|--------|
| double | tower |
| multiply by two | match |
| double the length | equals |
| partitioning | |

Teaching activity

Explain to the child that this activity is going to help them to learn about doubling numbers up to twenty.

Give the child the 10 card. Spread the 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 cards face down for the child to choose another card at random to add to the 10 card.

? What is the total of your two cards?

Give the child the card that represents their total and lay it on the table with the other two cards, for example:



? How can I work out double the total?

Support the child in doubling the ten and doubling the other number in order to find double the total.

Repeat with other cards drawn randomly to accompany the 10 card.

If the child can recall quickly how to work out doubles, challenge them to beat their own time against a sand timer, doubling as many numbers as they can before the sand runs through.

? What do you think you are doing well?

? What could you do better?

Spotlight 4

Does not use partitioning to find double twelve or double thirty-five

Opportunity for: applying mathematics in a real-life context

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Double your money

Time 10–20 minutes

Resources

- Either objects or picture cards, with items priced from 10p to 50p
- A collection of coins – all denominations up to £1 coin, with a number of coins of each type, except for 50p and £1 coins

Key vocabulary?

double equals
multiply by two partitioning
how much does it cost?

Teaching activity

Explain to the child that this activity is going to help them to double numbers up to fifty.

Ask the child to select an item.

? How much does it cost?

? How much would you have to pay for two?

Encourage the child to select the coins necessary to pay for the item. They can then check their answer to the second question by doubling the coins and counting.

Repeat using a different priced item each time.

If the child has difficulty with any particular numbers, ask them to explain their method.

Are they using 10p coins as part of their partitioning strategy?

Check that they are not counting on in ones, but are also using the five plus a bit strategy by choosing 5p coins.

? Which numbers are harder for you than others? Why do you think that is?

? What do you think is your best method for finding doubles?

Spotlight 5

Does not use partitioning to find double twelve or double thirty-five

Opportunity for: explaining and discussing

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Doubles bingo

Time 15–20 minutes

Resources

- At least two children
- Mini whiteboards for each child
- Two sets of number cards 0–50 (Resource sheets 1, 2, 3 and 4)
- Bag

Check: does the child use key vocabulary?

- | | |
|-----------------|--------------|
| double | equals |
| multiply by two | partitioning |

Teaching activity

‘Today we are going to play a game called **Doubles bingo**, and this game will help you to get even better at doubling numbers up to fifty.’

Divide up the number cards so that you have set 1 (all the even numbers from 10–50) face up on the table.

The set 2 cards are all the odd numbers from 5–25. You will use these to call the numbers, so they should be face down in a pile, or in a bag.

The players can cooperate in pairs or play against each other.

How to play

1. Each player chooses four cards from set 1, and writes these four numbers on their mini whiteboards.
2. Explain that you will call out a number from set 2 and that the players have to double that number and see if the answer is one of the numbers which they have written on their whiteboards. If it is, they cross it out. Put the card used to one side.
3. The first player to cross out all their numbers is the winner.
4. Ask the players to check that the numbers have been crossed out correctly.

Variations

- A child can be caller.
- Extend the numbers to 100.



Play a whole-class game with even numbers from one hundred and thirty to one hundred and fifty selected by the children and written on their whiteboards. Call out odd numbers from sixty-five to seventy-five.

Learning outcomes

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

- tackle related learning tasks with increased motivation and confidence;
- use and understand connected mathematical vocabulary;
- double numbers by partitioning into parts for which doubles are known.