# Double or halve?
Activity 1

Focus of activity: Doubling and halving 2-digit numbers using partitioning (whole number answers only).

Working together: conceptual understanding

- Lay out a set of 10s place value cards, from 10 to 50. Ask chn to help you to make each number using sticks of 10 and place the sticks under each card as they see them.

- *We are going to double all of these numbers.* Work along the line doubling each number, asking some chn to make the answer using sticks of 10, and place under the original sticks of 10, and other chn to build up a list of doubles facts on a big piece of paper as you double each amount: Double 10 is 20, double 20 is 40…

- Give each pair a set of 10s and 1s place value cards. Ask them to make the number 23. *To double 23 we can partition the number, double each part, and then add the two answers.* Ask one child in each pair to double 20, and the other to double 3. They then add their answers. Do they agree? Show how we can use a jotting to keep track of our steps:
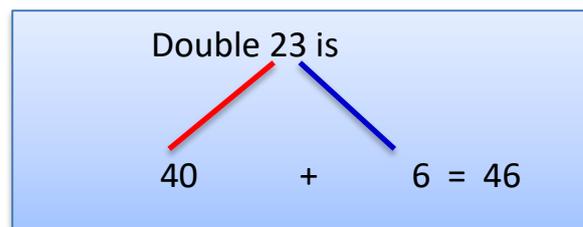
- *This is just like adding numbers using partitioning, because double 23 is the same as 23 add 23!*
- Repeat for 26 and 47, i.e. numbers where doubling the 1s will give an extra 10.
- Lay out a set of 10s place value cards, from 10 to 90. Ask chn to help you to make each number of sticks of 10 under each card as they see them.

- *We are going to halve all of these numbers.* Work along the line, taking particular care with 10, 30, 50, 70 and 90, where chn will need to see that we can break one of the 10s into 5 and 5. Chn use sticks of 10 and 1s cubes to show each answer, and build up a list of halving facts.

- Ask chn to make the number 24 using place value cards. *We can halve numbers using partitioning too!* Ask one child in each pair to halve 20, the other to halve 4, then to add their answers. Show how we can use a jotting to keep track of the steps:
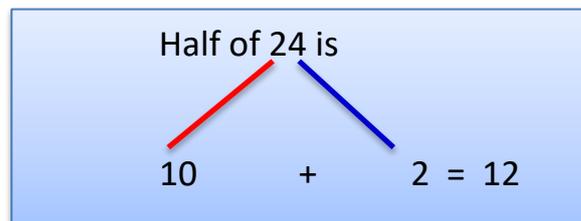
- Repeat for 46 and then 32 and 54, i.e... numbers with an odd number of 10s. Chn can use the list of facts to help.

Up for a challenge?

Sketch the following bar model diagram and ask chn to discuss what they think it shows. *What doubling and halving facts can we write to go with this picture?*

86	
43	43

Now it's the children's turn:

- One child in each pair shuffles the 10 to 40 cards and places them face down. The other child shuffles the 1s cards and places face down.
- They each turn over their top card and put them together to make a 2-digit number.
- Then they both double the number on their card, and add the answers to double the 2-digit number. They record the doubling fact, e.g. double 32 is 64.
- Repeat at least three more times.
- One child in each pair shuffles the 10 to 90 cards and places face down. The other child shuffles the even 1s cards, i.e. 2, 4, 6, and 8 and places them face down.
- They each turn over their top card and put them together to make a 2-digit number.
- Each child halves the number on their cards, and then they add the answers. They record the halving fact, e.g. half of 86 is 43.
- Repeat at least three more times.
- Go round the group and mark their calculations as they do them, e.g. initially after three examples.

S-t-r-e-t-c-h:

Ask chn to double some numbers between 50 and 100, e.g. 54, 63 and 72. Ask them to have some numbers with odd 1s digits, e.g. 23 and 45.

Things to remember:

Remember that when we double a 2-digit number, we can double the 10s, double the 1s, then add these two numbers together. Often when we double the 1s, we end up with an extra 10 to add! Ask chn to give an example where this happened, reading from their books. *Remember that when we halve a 2-digit number, we can halve the 10s, halve the 1s, then add these two numbers together.* You may want to add something that has emerged from the activity. This may refer to misconceptions or mistakes made.

Resources	Outcomes
• Place value cards: 10s and 1s • Base 10 equipment (Dienes)	1. Chn can double 2-digit numbers (answers less than 100). 2. Chn halve even 2-digit numbers. 3. Chn begin to double 2-digit numbers (answers more than 100). 4. Chn begin to halve odd 2-digit numbers.

Double or halve?

Work in pairs

Things you will need:
• A set of 10s and 1s place value cards

What to do:

• Shuffle the 10 to 40 cards. Place them face down.

• Shuffle the 1s cards and place face down.

• Take the top card from each pile and put them together to make a 2-digit number.

2 7

• One person doubles the number on the 10s card. The other person doubles the number on the 1s card.

• Find the combined total.

• Record the double in your books, e.g. double 27 is 54.

• Repeat at least three more times.

double 27 is

40   +   14 = 54

• Shuffle the 10 to 90 cards. Place them face down. Shuffle the even 1s cards, 2, 4, 6, and 8 and place face down.

• Take the top card from each pile and put them together to make a 2-digit number.

• Each person halves the number on one card.

• Add your answers. Record the halving fact, e.g. half of 86 is 43.

• Repeat at least three more times.

Half of 86 is

40   +   3 = 43

S-t-r-e-t-c-h:
Double some numbers between 50 and 100, e.g. 54, 63 and 72.
Halve some numbers with odd 1s digits, e.g. 23 and 45.

Learning outcomes:
• I can double 2-digit numbers (answers less than 100).
• I can halve even 2-digit numbers.
• I am beginning to double 2-digit numbers (answers more than 100).
• I am beginning to halve odd 2-digit numbers.