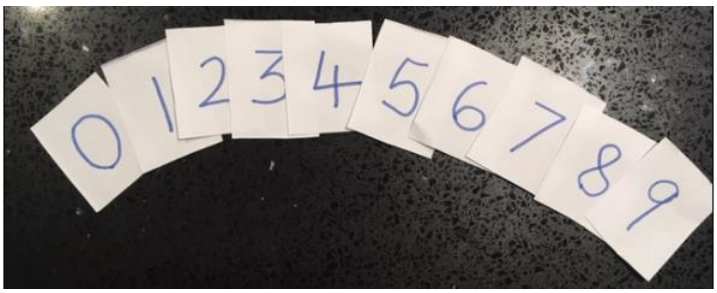
Balancing Numbers Week – Additive Reasoning Y3/4

This week you will need:

- Paper and pencil/ pen
- To record and keep your work each day because you will need to look back at it during the week. You could use the sheet provided or just record on paper.
- A piece of paper cut into ten small pieces and numbered 0 to 9 so you can move the numbers around during the tasks to help your thinking.



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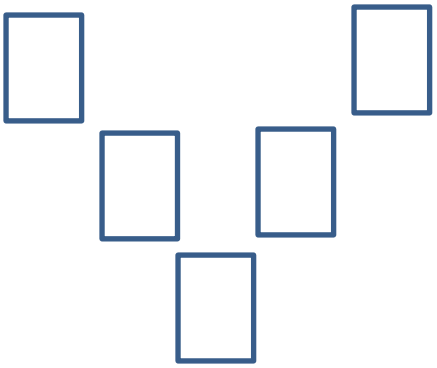

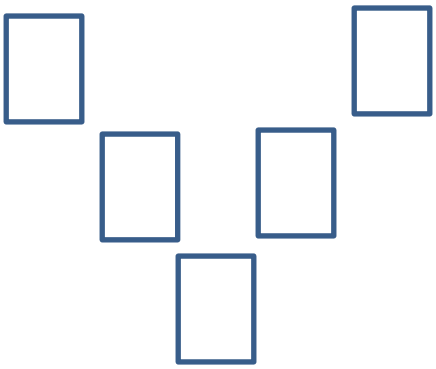

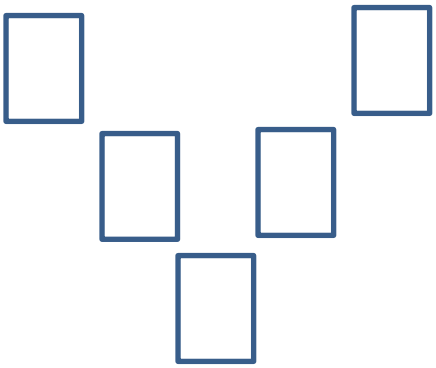

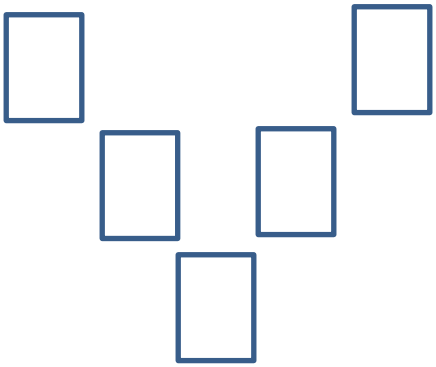

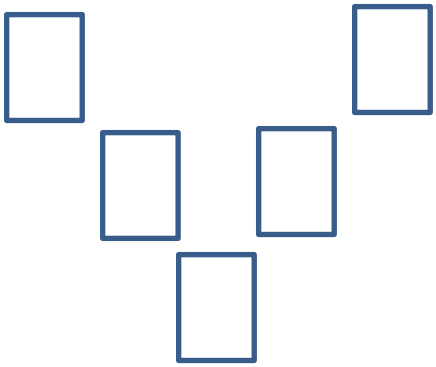

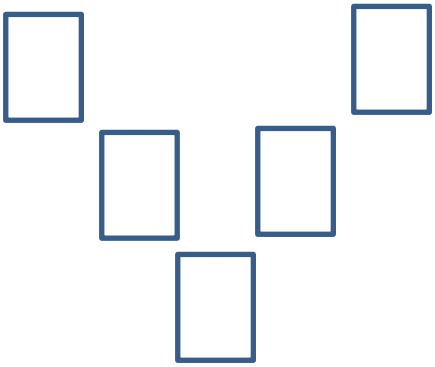

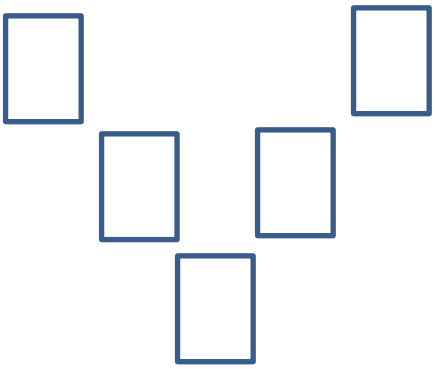

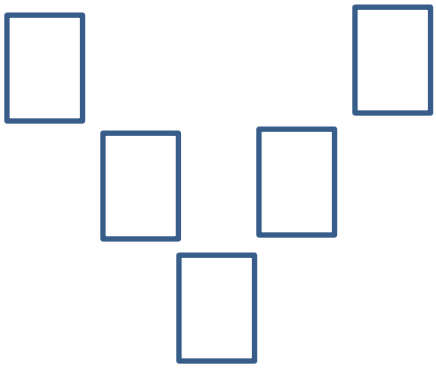

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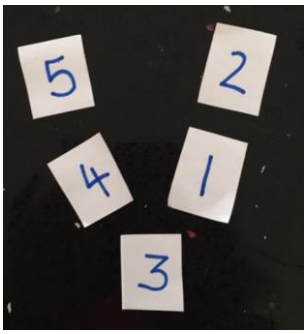
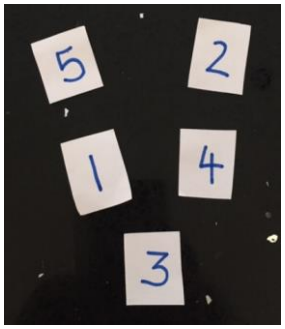
Balancing Numbers Week – Additive Reasoning Y3/4

Day 1

- You will be using the numbers 1, 2, 3, 4, 5. These are consecutive numbers because they follow on from each other when you are counting in ones.
- Look at these two Vs of numbers. What's the same about them? What's different about them?

A 

B 

- Add up the numbers in each arm of the Vs. For example, in A the total of the left arm is 12 because 5 + 4 + 3 = 12.
- What do you notice about the totals of each arm for A and for B?
- One of these Vs is a **'Magic V'** because both arms have the same total. The other V is **not** a Magic V because the two arms have a different total. Keeping the number 3 at the bottom of the V rearrange the numbers so that the two arms still have the same total.
- How many different ways can you find to make a Magic V with 3 at the bottom? Record your solutions.
- Next try with 2 at the bottom.
- Record what you do.
- What do you notice?

Notes for adults working with groups of children

- Ensure the children record their findings so that they can compare work on different days.

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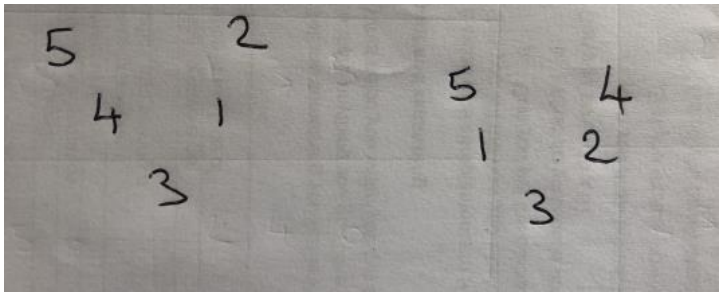
Balancing Numbers Week – Additive Reasoning Y3/4

Day 2

- Look at what you did yesterday.



Not Magic Magic

- Using the same numbers 1, 2, 3, 4, 5 make some more Magic Vs.
- Try with 1, then 4 and then 5 at the bottom of the V.
- How many more Magic Vs can you find?
- How do you know you've found them all?
- What do you notice about the bottom number in all of your Magic Vs?

Notes for adults working with groups of children

- Ensure the children record their findings so that they can compare work on different days.
- Encourage the children to explain what they notice about what is the same about the bottom numbers in all of the Magic Vs.

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Balancing Numbers Week – Additive Reasoning Y3/4

Day 3

- Use the numbers 2, 3, 4, 5, 6 to make a Magic V.
- How many Magic Vs can you find using these numbers?
- Look at the bottom numbers in the Magic Vs you made with the numbers 1, 2, 3, 4, 5.
- Compare them with the bottom numbers of the Magic Vs you have made today.
- What do you notice?
- **Hint**: You might want to think about odd and even numbers.

Notes for adults working with groups of children

- Ensure the children record their findings so that they can compare work on different days.
- Encourage the children to work systematically. For example, starting with 2 at the bottom of the V and finding all the ways to pair up the remaining four numbers on each arm (3/4 and 5/6, 3/5 and 4/6, 3/6 and 4/5). There will be other ways to be systematic; this will allow the children to know they have found all possible Magic Vs.

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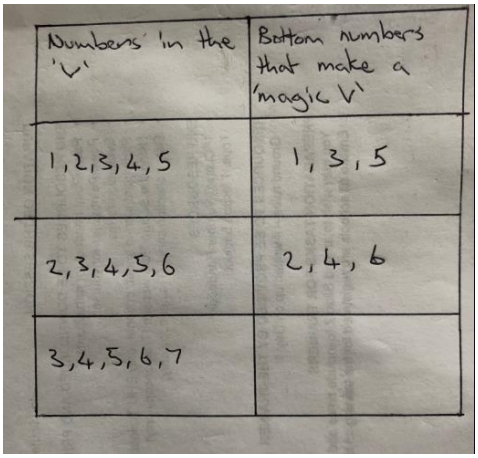
Balancing Numbers Week – Additive Reasoning Y3/4

Day 4

- Look at the bottom numbers in the Magic Vs you have made over the past three days.
- Put them in a table like this:



Numbers in the 'V'	Bottom numbers that make a 'magic V'
1, 2, 3, 4, 5	1, 3, 5
2, 3, 4, 5, 6	2, 4, 6
3, 4, 5, 6, 7	

- Which bottom numbers do you think will make Magic Vs using the numbers 3, 4, 5, 6, 7?
- Try them out and put the numbers that work in the table.
- What do you notice?
- Explain what you've noticed to somebody else in your house. You might want to share your table when you explain.
- What do you think will happen if you use the numbers 0, 1, 2, 3, 4? Which numbers will be at the bottom of the Magic Vs?

Notes for adults working with groups of children

- Ensure the children record their findings so that they can compare work on different days and predict what might happen with other sets of numbers.
- Encourage the children to work systematically. For example, starting with 3 at the bottom of the V and finding all the ways to pair up the remaining four numbers on each arm. There will be other ways to be systematic; this will allow the children to know they have found all possible Magic Vs.

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Day 5

- Look at your table from yesterday.
- What do you think will happen if you try to make Magic Vs with the numbers 4, 5, 6, 7, 8? Which numbers would be at the bottom of the Magic Vs? How do you have to arrange the other four numbers on the arms to make Magic Vs?
- Try your ideas out and see if you are right.
- Think of your own set of five consecutive numbers. For example: 10, 11, 12, 13, 14. Which numbers do you think will be at the bottom of the Magic Vs? Why?
- What if you now use five numbers that go up in twos, for example: 2, 4, 6, 8, 10 or 3, 5, 7, 9, 11? Which numbers do you think will be at the bottom of the Magic Vs for these sets of numbers?
- Test out your ideas.
- What do you notice?
- Explain what you have noticed to somebody else in your house.

Notes for adults working with groups of children

- Ensure the children record their findings so that they can compare what happens with different sets of numbers, notice pattern and predict what might happen with other sets of numbers.
- Encourage the children to work systematically and to explain their thinking.

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