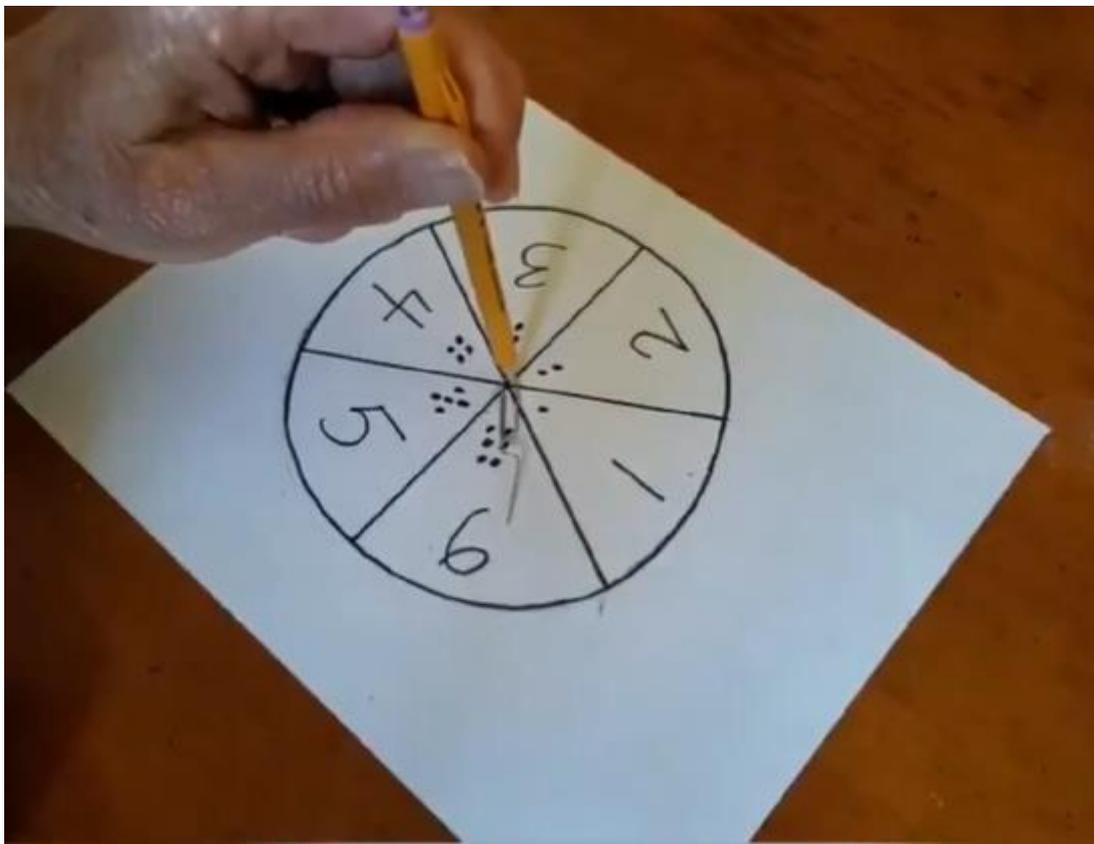


## Dice Week – Additive and Multiplicative Reasoning Y3/4

### For this week you will need:

- Two six-sided dice or a spinner.
- If you don't have any dice at home you can find dice on the internet at: <https://www.random.org/dice/>
- Or you can make an easy [spinner](#). Trace a plate to make a spinner face, use a pencil & a paper clip, place the pencil point inside the paper clip in the centre of the spinner and spin the paper clip.



- Pencil and paper

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## Dice Week – Additive and Multiplicative Reasoning Y3/4

### Day 1

- Write the numbers 1 to 12 in a simple table.

1	2	3	4	5	6	7	8	9	10	11	12
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- Throw two dice (or spin twice) and add the numbers together to find the total. Mark the total on the table.
- Throw the two dice again and total them. Mark the total on the table. Do this at least 20 times, marking your totals on the table each time.

1	2	3	4	5	6	7	8	9	10	11	12

- Look at your totals. Which numbers came up most often? Why do you think this is?
- What do you think would happen if you did another 20 throws?

#### **Notes for adults working with groups of children**

- Help the children to create a table and make sure they record their total each time.
- Talk with the children about whether 1 could ever be the total and ask them to explain.

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## Dice Week – Additive and Multiplicative Reasoning Y3/4

### Day 2

- Look back at your numbers from day 1. Choose one of the numbers which came up most often. How many ways can you make that number by adding two dice/spins? For example, you can make 4 by throwing 1 and 3, 2 and 2 or 3 and 1 – so there are three ways to make 4.

Number	Ways	Total
1		
2		
3		
4	1+3, 2+2, 3+1	3
5		
6		
7		
8		
9	4+5, 3+6, 5+4, 6+3	4
10		
11		
12		

- How many different ways can you make each of the numbers from 2 to 12?
- How do you know you have found all of the ways to make each number?
- What do you notice?

#### **Notes for adults working with groups of children**

- Help the children to find all the possibilities systematically. It might help to have the two dice there for the children to move around as they consider different possibilities. One way to be systematic is to start with 1 + each time and then 2 + etc. For example for 4: 1 + 3, 2 + 2, 3 + 1. Another way is to start with 1 + then find a matching pair the other way round. For example for 4: 1 + 3 and 3 + 1, then 2 + 2. There will be other ways to be systematic as well; encourage the children to explain how they know they have found all the ways.

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## Dice Week – Additive and Multiplicative Reasoning Y3/4

### Day 3

- Throw two dice (or spin twice) and multiply the two numbers together and write down the answer. For example, if 6 and 3 are thrown write down 18 because  $6 \times 3 = 18$ .
- Repeat at least 20 times, recording your answers as you go.
- Look at your answers. Which numbers appear most often? Why do you think this is?
- You might like to try throwing the dice another 20 times to see if the same numbers appear most often.

#### *Notes for adults working with groups of children*

- Help the children to organise their recordings so that it is easy for them to see which numbers occur most often.

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## Dice Week – Additive and Multiplicative Reasoning Y3/4

### Day 4

- Look back at your numbers from day 3. Choose one of the numbers which came up most often. How many ways can you make that number by multiplying two dice/spins? For example, you can make 12 by throwing 2 and 6, 3 and 4, 4 and 3 or 6 and 2 – so there are four ways to make 12.
- Which is the largest number you can make by multiplying two dice/spins? Which is the smallest number?
- Can you make all the numbers in between the largest and smallest? For example, can you make 14, 15, 16 etc.?
- What do you notice?

#### ***Notes for adults working with groups of children***

- Help the children to find all the possible products systematically. It might help to have the two dice there for the children to move around as they consider different possibilities. One way to be systematic is to start with 1 on one dice and then change the other number from 1 to 6 recording all possibilities. Repeat this with 2 on the first dice etc. There will be other ways to be systematic as well.
- Encourage the children to explain how they know they have found all the possible numbers and what they notice.

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## Dice Week – Additive and Multiplicative Reasoning Y3/4

### Day 5

- Mel says ‘when you throw two dice and multiply them together you will get more odd answers than even answers’. Do you agree? Why?
- Throw two dice (or spin twice) and multiply the two numbers together and write down the answer. For example, if 6 and 3 are thrown write down 18 because  $6 \times 3 = 18$ .
- Repeat at least 20 times recording your answers as you go.
- Look at your answers. Count how many of the numbers are odd and how many are even. Was Mel right? Is this what you expected?
- Try again to make sure.
- Explain why this happens to someone else.

#### *Notes for adults working with groups of children*

- Encourage the children to explain their thinking before they start throwing the dice and then to explain what they have found after they have done 20 throws.

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