



**Advanced Mathematics
Support Programme®**

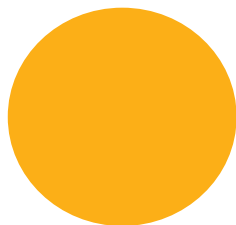


Whose triangle is it?

A classroom resource looking at
Pascal's triangle and its wider historical
origins

Choosing objects

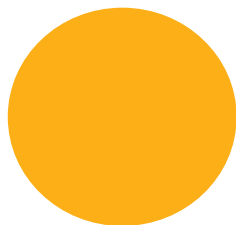
Imagine I have 3 objects



How many ways are there of choosing one object?

Choosing objects

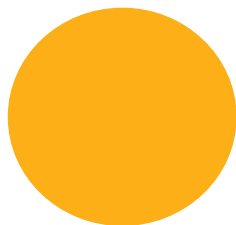
Imagine I have 3 objects



How many ways are there of choosing two objects?

Choosing objects

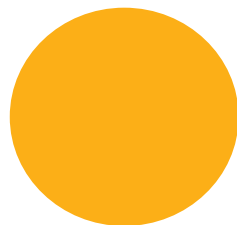
Imagine I have 3 objects



How many ways are there of choosing three objects?

Choosing objects

Imagine I have 3 objects

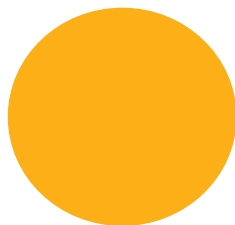


How many ways are there of choosing three objects?

How many ways are there are choosing zero objects?

Choosing objects

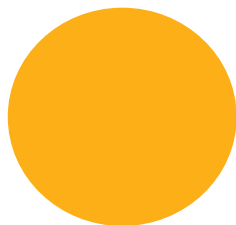
Imagine I have 3 objects



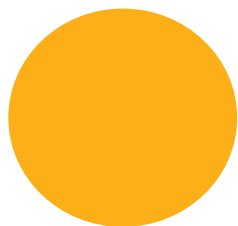
Objects chosen	0	1	2	3
Number of ways	1	3	3	1

Choosing objects

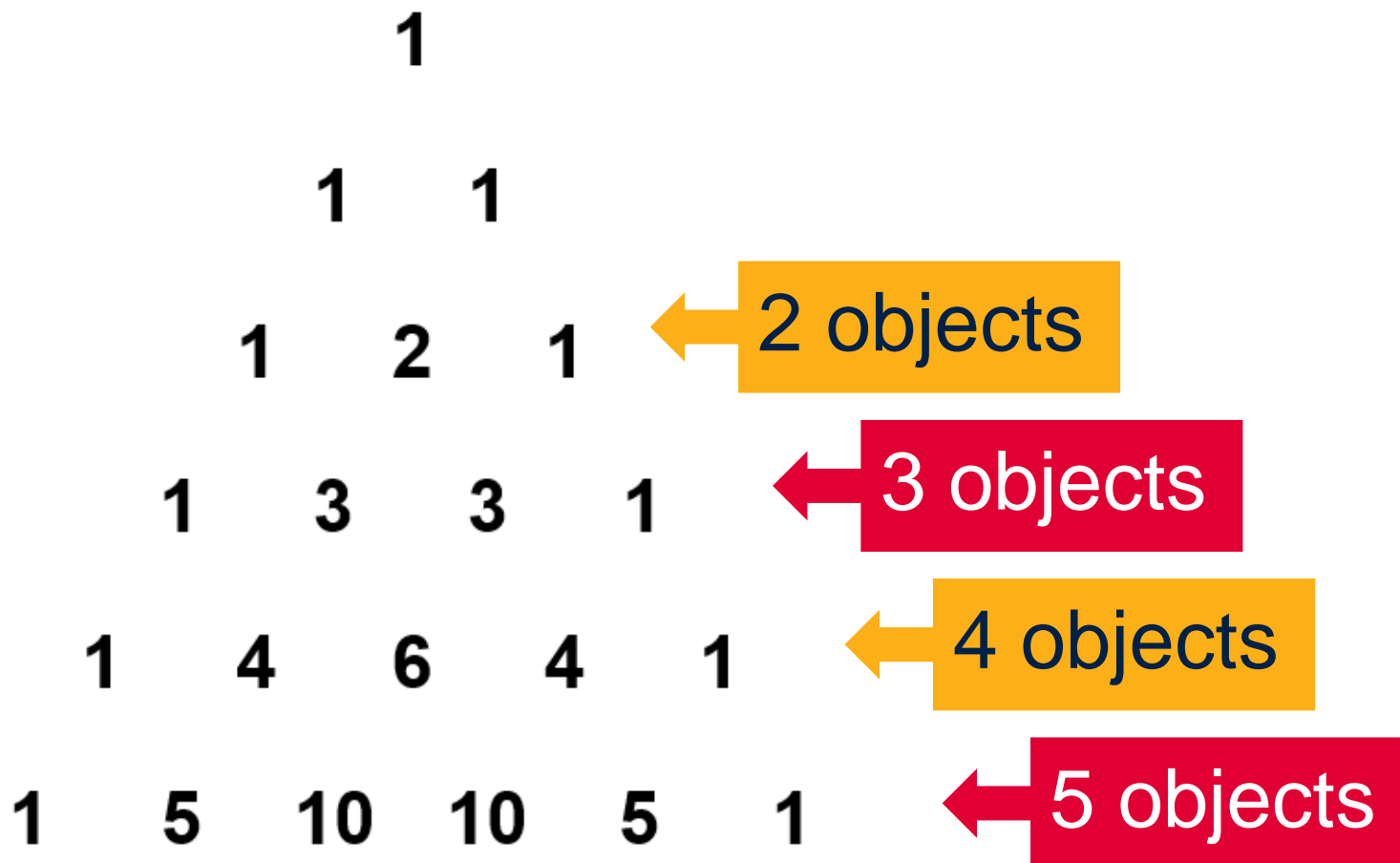
Repeat the process for 2 objects



And for 4 objects



Choosing objects - summary



Pascal's triangle

Born: Clermont, France 1623

Died: Paris, France 1662

Influential mathematician and philosopher

In collaboration with the mathematician Pierre de Fermat he laid the foundations for the theory of probability

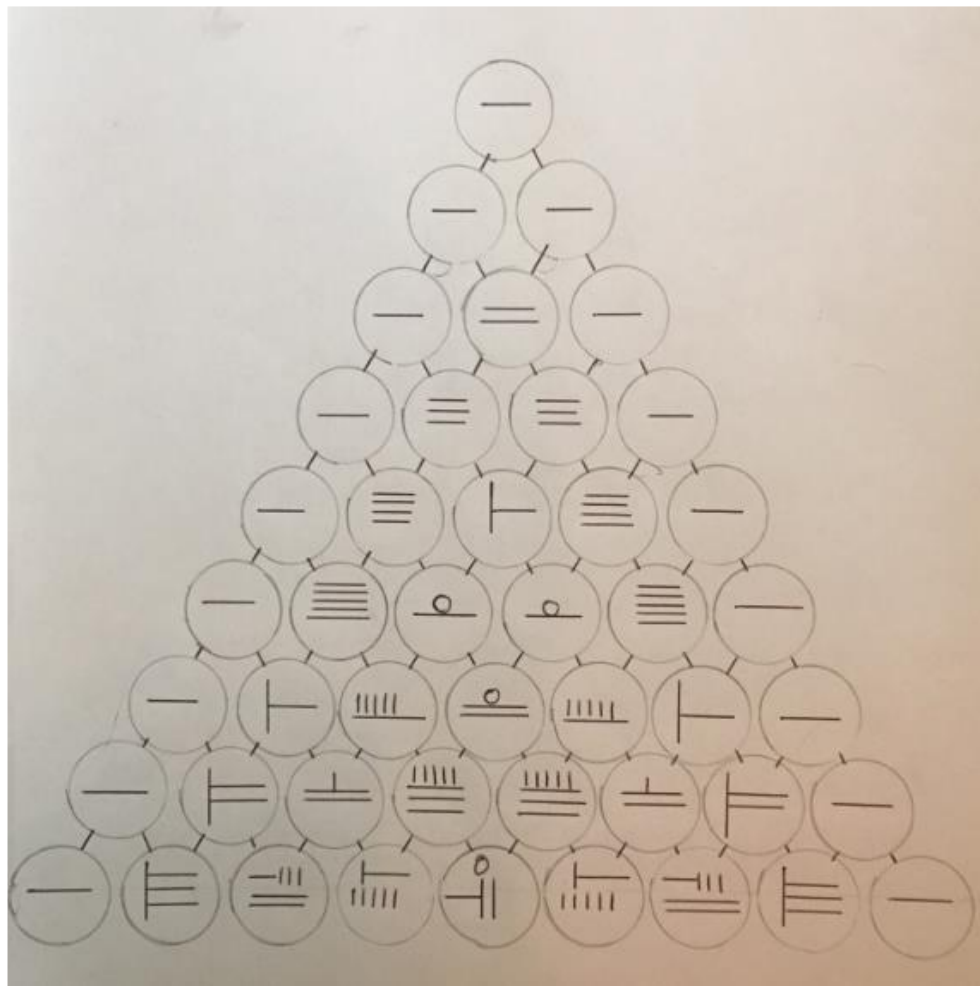


Zhu Shijie's triangle

Born: Beijing, China c1260

Died: c1320

Was known to have produced the triangle shown in image but refers to this as an 'old method' suggesting it was known well before his lifetime.



Where next?

Expand the following expressions – what do you notice?

$$(x + y)^2$$

$$(x + y)^3$$

$$(x + y)^4$$

Could you predict the expansion of $(x + y)^5$?

How does this relate to Zhu Shijie / Pascal's triangle?

Where next?

A biased die has probability $\frac{1}{5}$ of landing on 6.

The die is rolled four times.

What is the probability of obtaining:

- No 6's
- One 6
- Two 6's
- Three 6's
- Four 6's

How does this relate to Zhu Shijie / Pascal's triangle?

About the AMSP

- A government-funded initiative, managed by MEI, providing national support for teachers and students in all state-funded schools and colleges in England.
- It aims to increase participation in AS/A level Mathematics and Further Mathematics, and Core Maths, and improve the teaching of these qualifications.
- Additional support is given to those in priority areas to boost social mobility so that, whatever their gender, background or location, students can choose their best maths pathway post-16, and have access to high quality maths teaching.

Contact the AMSP



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