GCSE HIGHER · REVISION MAT 4

# Counting strategies

**1** A spinner shows 1, 2 or 3 and a coin is flipped.

List all the outcomes.

**2** In how many ways can the letters of MATHS be arranged?

**3** Explain why 81 two-digit numbers can be made from the digits 1 to 9 if digits may repeat.

**4** An ice cream has one of 8 flavours, one of 3 toppings, and a cone or a tub.

How many choices are there?

**5** Show that there are 60 ways to arrange 3 of 5 books in a row.

**6** A mobile number is 07 followed by 9 digits.

How many numbers are possible?

**7** Show that there are 45 handshakes when 10 people each shake hands once.

**8** 5 people sit in a row.

Two of them must sit together.

How many arrangements are there?

Mr&Mrs MATHS

ANSWERS · REVISION MAT 4

# Counting strategies

**1** **1H, 1T, 2H, 2T, 3H, 3T**

**2** $5 \times 4 \times 3 \times 2 \times 1$

**120**

**3** **9 choices for each digit: $9 \times 9 = 81$**

**4** $8 \times 3 \times 2$

**48**

**5** $5 \times 4 \times 3$

**= 60**

**6** **$10^9$ (1 000 000 000)**

**7** $10 \times 9 \div 2$

**= 45**

**8** Treat the pair as one: $4! = 24$

The pair can swap: $\times 2$

**48**

Mr&Mrs MATHS