

Systematic listing

N5 · Number · revision notes

List possible outcomes in a clear order so that none is missed or repeated. Use small lists, tables or branches to organise choices, and read any restrictions carefully.

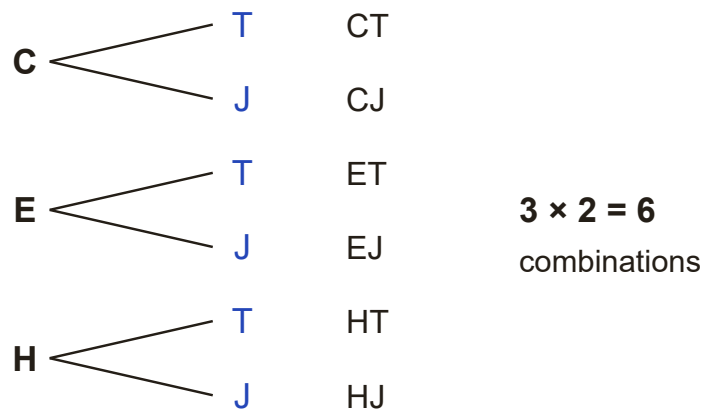
Key facts

- Fix the first choice and list every allowed second choice before moving on.
- Count distinct outcomes only.
- Check whether changing the order makes a different outcome.
- An even whole number ends in 0, 2, 4, 6 or 8.

Notes

Systematic listing

- Work in a fixed order so you don't miss or repeat an outcome.
- For combinations from two lists, fix the first item and pair it with every item in the second list, then move on to the next first item.
- Example: 3 sandwiches (cheese C, egg E, ham H) and 2 drinks (tea T, juice J) give CT, CJ, ET, EJ, HT, HJ: 6 combinations.



Fix the first choice, pair it with every second choice, then move on.

- If order doesn't matter (e.g. choosing two flavours), AB and BA are the same choice: list each pair only once.

Checking a condition

- Read whether repeats are allowed before you start. With digits 2 and 5 used once each, the complete two-digit list is 25, 52; neither 22 nor 55 is allowed.
- Make the complete small list first, then test each entry against the condition. For an even number, the final digit must be even. In the list 25, 52, only 52 is even.
- If order does not matter, two reversed entries describe the same choice. When choosing two different colours from red, blue and green, list red-blue, red-green and blue-green once each.
- Check both things at the end: every allowed outcome is present, and no outcome is repeated. A tidy table or grouped list makes this easier to see.

How to answer each type of question

M = method mark, A = answer mark, B = a mark on its own.

List all the possible combinations

2 marks

Grade 3

1. Use letters or short labels for each item.
2. Fix the first choice and go through every option for the second, then move on.
3. Check each group against the available choices, then check the list for repeats.

Example. Asha chooses one base and one topping for a pizza.

Bases: thin (T), deep (D). Toppings: ham (H), mushroom (M), pepper (P), olive (O).

List all the possible combinations she could choose.

Model answer. TH, TM, TP, TO, DH, DM, DP, DO (B2 for all 8 with no extras or repeats; B1 for at least 4 correct)

Use a condition to select outcomes

2 marks

Grade 4

1. List all the outcomes in a fixed order.
2. Cross out entries that do not meet the condition, then give those left.

Example. Use the digits 2, 3 and 5 once each to make three-digit numbers. List all the even numbers you can make.

Model answer. The complete list is 235, 253, 325, 352, 523, 532 (M1). The even numbers end in 2: 352 and 532 (A1).

Don't lose marks

- ✗ Listing without a system, and missing or repeating combinations.
- ✗ Allowing repeats when the question says the letters or digits are different.
- ✗ Ignoring a condition such as 'the first digit cannot be 0' or 'the number must be even'.
- ✗ Counting the same pair twice (AB and BA) when the order doesn't matter.

More tips

Memory tricks

- Use short labels to keep a list tidy.
- Group outcomes by their first item so gaps are easy to find.

Exam technique

- When asked to list, set out the list clearly in order; one missing or repeated item usually costs a mark.
- Underline words such as 'different', 'no repeats', 'even', 'greater than' and 'cannot start with'.

What each grade needs

What you need to be able to do, from the first marks up to the top grade.

Grade 2

List outcomes in a systematic order

E.g. the two-digit numbers made from 3, 5 and 8 without repeats: 35, 38, 53, 58, 83, 85.

Grade 3

List combinations from two or three sets

Fix one item and run through every option for the others, then check you have them all.

Grade 4

Check restrictions in a completed list

Cross out outcomes that break the condition, such as repeated digits or an odd final digit, then count those left.

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