Use What You Know

50 Year 5 Challenge Cards

from Familiar Frontiers

Free sample · screen version · colour

10 sample cards.

- One card per page; the answer is on the next page.

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50 quick Year 5 challenges for applying familiar learning to unfamiliar problems.

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familiarfrontiers.co.uk/use-what-you-know

hello@familiarfrontiers.co.uk

UseWhatYouKnow-Free-Sample-Screen.pdf

Use What You Know · v1.0.1 · build 13a1055 · edition S

How to use these cards

These ten free cards are a small sample of Use What You Know.

They are designed for Year 5 children to practise using familiar knowledge in unfamiliar situations. Anything unusual that your child needs is given on the card.

Try them like this:

- Let your child attempt the card before looking at the answer.
- Help them understand the information, but try not to point out which number, rule or clue matters.
- If they get stuck, ask something neutral such as: “What are you actually being asked to find?” or “What information have you been given?”
- Read the answer together afterwards, especially the **What mattered** line.

You can try one card at a time or use five as a short session.

On a screen, view one page at a time so the answer does not appear beside the card.

A greenhouse watering machine has only two buttons.

Buttons

Button	Volume (litres)
BLUE	0.4
GREEN	0.25

Target: 1.3 litres

A planting tray needs exactly 1.3 litres. What is the fewest number of button presses that can give exactly 1.3 litres?

(A) 3

(B) 4

(C) 5

(D) It cannot be done exactly

Answer

B. 4

How to work it out

Three presses cannot reach 1.3 L because even three BLUE presses give only 1.2 L. Four presses can work: 0.4 + 0.4 + 0.25 + 0.25 = 1.3 L. So four is the fewest possible.

What mattered

Checking both that the target can be reached exactly and that no smaller number of presses can do it.

A ranger needs to travel from Oak Farm to Lookout. All roads can be travelled in either direction.

Roads

Road	Distance (km)	Open
Oak Farm – Mill	1.8	Yes
Mill – Lookout	1.6	No
Oak Farm – Bridge	2.1	Yes
Bridge – Lookout	2.0	Yes
Mill – Bridge	0.9	Yes

What is the shortest OPEN route distance from Oak Farm to Lookout? Give your answer in kilometres.

Answer

4.1 km

How to work it out

The closed Mill–Lookout road cannot be used. Oak Farm → Bridge → Lookout is 2.1 + 2.0 = 4.1 km. Going via Mill and Bridge is 1.8 + 0.9 + 2.0 = 4.7 km, so 4.1 km is the shortest open route.

What mattered

Checking which routes were actually available before comparing their distances.

A historian wants to investigate what workers actually heard inside a factory in 1893.

A *Diary of a factory worker, 1893*

By midday my ears rang from the stamping machines. We had to shout to speak to the person beside us.

B *Factory owner's newspaper advertisement, 1893*

Our modern workshop is quiet enough for workers to speak comfortably while the machines are running.

Which source gives stronger evidence about what workers actually heard while working? Give one reason based on what the source describes OR why the source was created.

Answer

Source A

How to work it out

Source A is stronger for this question because it is a first-hand account from someone inside the factory and directly describes the effects of the noise. Source B also mentions noise, but it is an advertisement, so the owner had a reason to present conditions positively.

What mattered

Judging evidence by how directly it answers the question and why the source was created.

A museum has a model bridge. Triangular braces help the frame keep its shape. The caption must be clear for 9–11-year-old visitors and explain why the triangles are there.

Which caption best fits?

(A) Triangles help make the model bridge steadier when weight or pushing forces act on it.

(B) Engineers add triangular braces to frames like this one.

(C) These triangles make the bridge completely impossible to bend.

(D) Triangular bracing gives rigidity by converting bending forces into tension and compression.

Answer

A. Triangles help make the model bridge steadier when weight or pushing forces act on it.

How to work it out

A explains the purpose of the triangles in language suitable for 9–11-year-olds. B does not explain why they are used. C overclaims by saying bending is impossible. D gives a technical explanation, but its vocabulary is not appropriate for the stated audience.

What mattered

Choosing wording that does both jobs: explain the feature and suit the intended reader.

A designer needs a casing for a small outdoor sensor. It must be waterproof, be an electrical insulator, and be strong enough not to crack when dropped.

Requirements

- waterproof
- electrical insulator
- strong enough not to crack when dropped

Material	Water absorbed in test	Bulb when material completes circuit	After drop
P	0 ml	On	Intact
Q	0 ml	Off	Intact
R	3 ml	Off	Intact
S	0 ml	Off	Cracked

Which material should the designer choose?

(A) P
(B) Q
(C) R
(D) S

Answer

B. Q

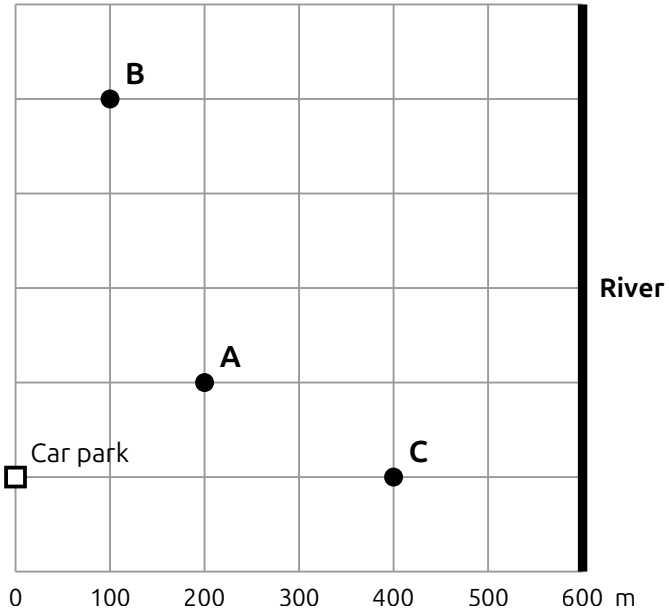
How to work it out

Q satisfies all three requirements. It absorbs no water, the bulb stays off when Q completes the circuit, and it remains intact after the drop. P conducts electricity, R absorbs water and S cracks, so each of those fails one part of the brief.

What mattered

Translating the design requirements into evidence from each test and checking every requirement.

A park needs a new picnic site.



1 grid interval = 100 m
Distances follow horizontal and vertical grid lines.

Rules

- No more than 400 m from the car park.
- At least 300 m from the river.

Which site meets BOTH rules? Give the site, its distance from the car park, and its distance from the river.

Answer

Site A — 300 m from the car park and 400 m from the river.

How to work it out

A is 200 m across and 100 m up from the car park, so its grid distance is 300 m; it is 400 m from the river. B is 500 m from the car park, while C is only 200 m from the river. Only A satisfies both rules.

What mattered

Checking both distance constraints independently and counting grid intervals rather than just looking at position.

1 *Council notes, two days after the 1908 flood*

Two supports cracked during the flood. Engineers advised closing the bridge and building a replacement.

2 *Shopkeeper's letter, six months before the flood*

The bridge is crowded on market days, but carts still cross it from morning until evening.

Which conclusion is BEST supported by both sources?

(A) Flood damage seems to have led to replacement, although crowding was already a problem.

(B) Crowding seems to have closed the bridge before the flood, with flood damage happening later.

(C) The flood may have caused the crowding, which then seems to have led to replacement.

(D) Crowding appears to have been the main reason, while the flood seems to have caused little or no damage.

Answer

A. Flood damage seems to have led to replacement, although crowding was already a problem.

How to work it out

Source 2 shows the bridge was crowded before the flood but was still being used. Source 1 says the flood cracked two supports and engineers then advised closure and replacement. The best-supported conclusion is therefore that crowding was an earlier problem but flood damage seems to have led to replacement.

What mattered

Combining the timeline and both sources without claiming more than the evidence supports.

A warehouse has a parcel-routing policy and an automatic sorter.

Policy

- Any fragile parcel must go to CAREFUL.
- Otherwise, parcels weighing more than 10 kg go to HEAVY.
- All other parcels go to STANDARD.

Sorter steps

1. If the parcel weighs more than 10 kg, send it to HEAVY and stop.
2. If not, and the parcel is fragile, send it to CAREFUL and stop.
3. Otherwise, send it to STANDARD.

Which parcel will the sorter send to the wrong place?

(A) 4 kg, not fragile
(B) 12 kg, not fragile
(C) 10 kg, fragile
(D) 12 kg, fragile

Answer

D. 12 kg, fragile

How to work it out

A 12 kg fragile parcel should go to CAREFUL because the policy gives fragility priority. The sorter checks weight first, so it sends that parcel to HEAVY and stops. A 10 kg fragile parcel is routed correctly because 10 kg is not more than 10 kg.

What mattered

Tracing the rules in order and testing the case where two conditions overlap.

Maya tested four wrapping materials to find which kept ice from melting best.

Wrapping	Starting ice mass	Ice melted after 15 minutes
Foil	50 g	15 g
Felt	50 g	8 g
Bubble wrap	40 g	7 g
Paper	50 g	12 g

Which conclusion is BEST supported by these results?

(A) Bubble wrap performed best because only 7 g of ice melted.

(B) Felt performed best among the three tests that started with the same mass of ice.

(C) Foil performed best because it started with more ice than bubble wrap.

(D) Because one test started with less ice, the experiment cannot tell us anything useful about any of the materials.

Answer

B. Felt performed best among the three tests that started with the same mass of ice.

How to work it out

Bubble wrap cannot be compared directly using raw grams because it started with only 40 g of ice. Foil, felt and paper all started with 50 g. Of those comparable tests, felt had the least ice melt, so B is the strongest conclusion supported by the evidence.

What mattered

Checking whether results are genuinely comparable before choosing the smallest number.

In the made-up language Lumo, use the supplied vocabulary, plural rule and examples.

Vocabulary

Lumo	English
tal	tree
zor	house
mep	tall
len	small

Rule

- Adding -im makes a noun plural.

Examples

Lumo	English
tal mep	tall tree
talim mep	tall trees

Using the pattern above, write “small houses” in Lumo.

Answer

zorim len

How to work it out

The plural rule changes zor, meaning house, to zorim, meaning houses. The examples show that the describing word comes after the noun and does not change when the noun becomes plural. Therefore “small houses” is zorim len.

What mattered

Using both the stated plural rule and the pattern shown by the examples.

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