

● ● ● | Developing 'Patient Problem Solvers'

Laura Pearson
Head of Mathematics



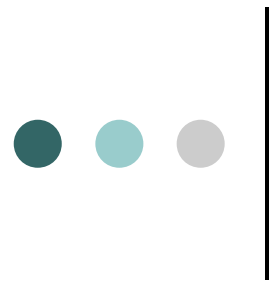
Rhymney Comprehensive School





“I’m stuck”?





Change the culture in our classrooms and the mindset

- Fearful of making mistakes
- Reluctant to take on challenges
- Believe that talents and abilities are set in stone
- Prefer to stay in their comfort zone



Dan Meyer

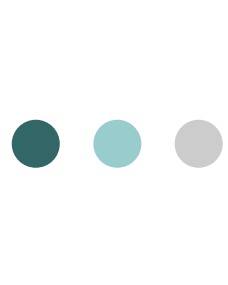


“ I sell a product to a market that doesn’t want it, but is forced by law to buy it”



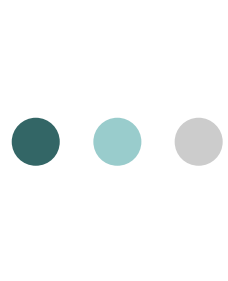
Impatient Problem Solvers

- A lack of initiative
- A lack of perseverance
- A lack of retention
- An aversion to reading information
- An eagerness for a formula



Developing Patient Problem Solvers

- Develop “*metacognition*”
- Involve pupils in the *formulation of problems* not just solutions
- Be *less helpful*



Phase 1 - PISA

“Thinking about Thinking”

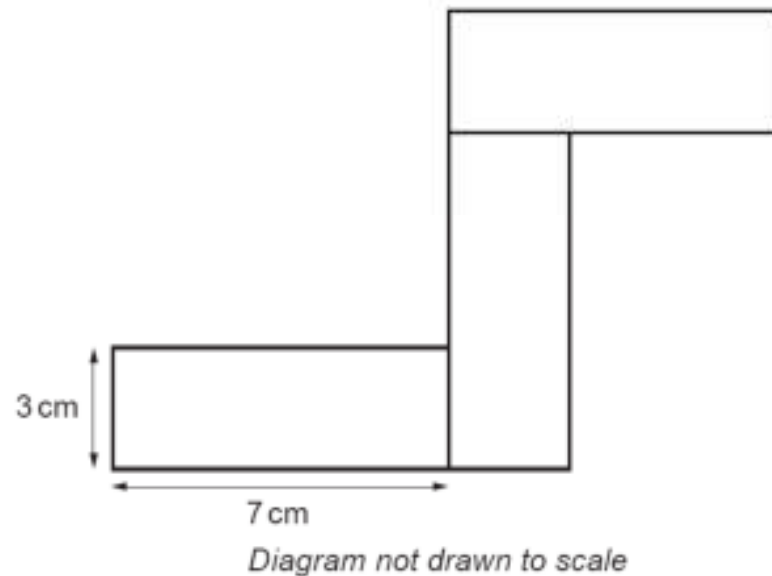
- Remove the question

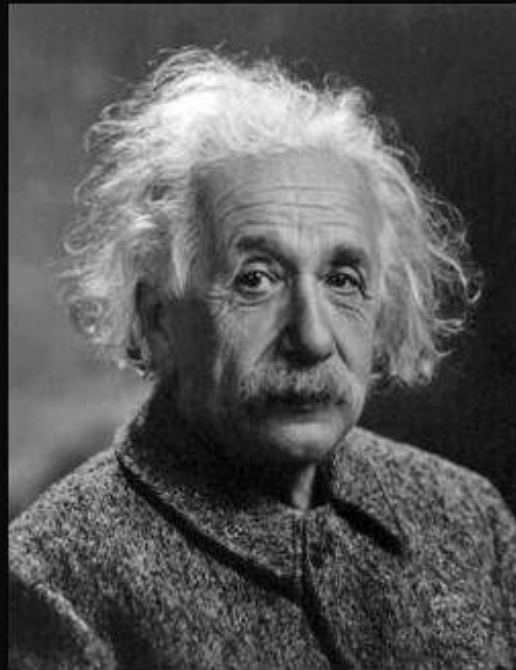
Three identical rectangles, each measuring 7 cm by 3 cm, are placed together to make the shape shown in the diagram.

- What can you SEE?

- What can you DO?

- What can the QUESTION be?





The formulation of a problem is often more essential than its solution, which may be merely a matter of mathematical or experimental skill.

(Albert Einstein)

izquotes.com



Phase 2 - QWC

- WJEC quality of written communication questions
- Improve mathematical literacy
- Improve standards of spelling, punctuation and grammar
- Explain their steps

I



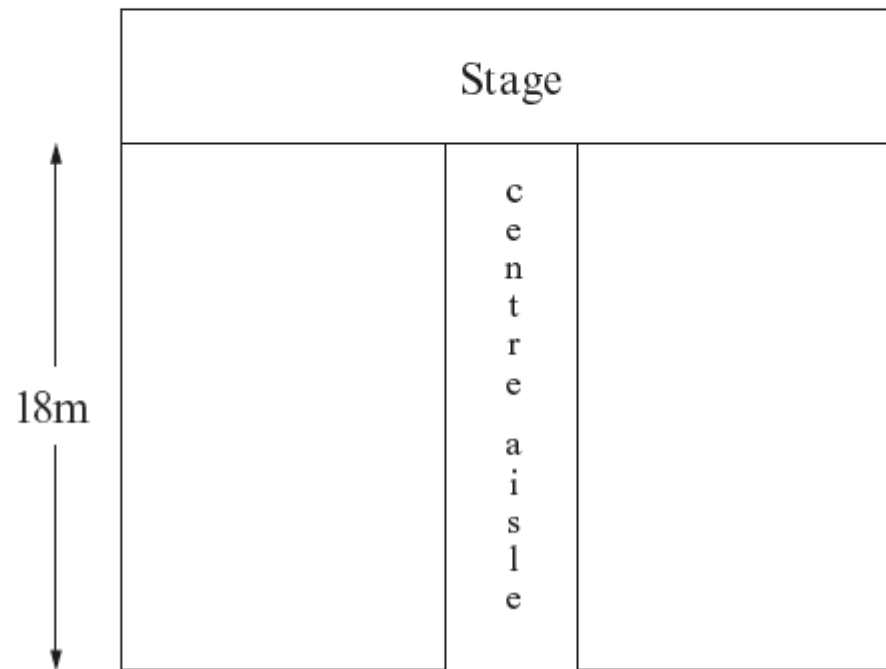
You will be assessed on the quality of your written communication in this question.

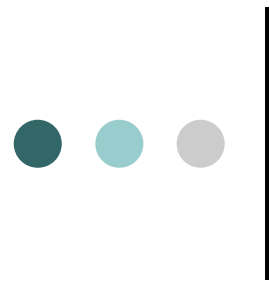
Year 10 pupils have been asked to arrange the seating for a concert in the school hall.

They work out that each row will have 12 seats on each side of the centre aisle.

Each row will take up 2 metres of the 18 metre length of the hall.

Showing all your working, decide whether or not there will be enough seats for 200 people.





Phase 3 - EAS Raising the Bar in GCSE Mathematics

- Integrate the metacognitive style teaching and learning into every lesson
- Prepare teachers for the delivery of new GCSE specification
- Prepare pupils for the new GCSE examinations



Numeracy specification

- Solving problems in the real world and the problem-solving cycle will feature within the specification as well as the more numerical aspects of mathematics. There will also be opportunities for learners to make informed decisions about the use of technology, the management of money and the use of statistics.

Sample assessment materials

4. *You will be assessed on the quality of your organisation, communication and accuracy in writing in this question.*

Sam and Laura own $\frac{3}{4}$ of the company *Dragon CarCare*.

They each own $\frac{1}{2}$ of this $\frac{3}{4}$ share.



It cost a total of £8000 to set up the original business.

This set-up cost was paid in proportion to the share each person has in the business.
After 6 months, Laura received £3200 as her share of the profits so far.

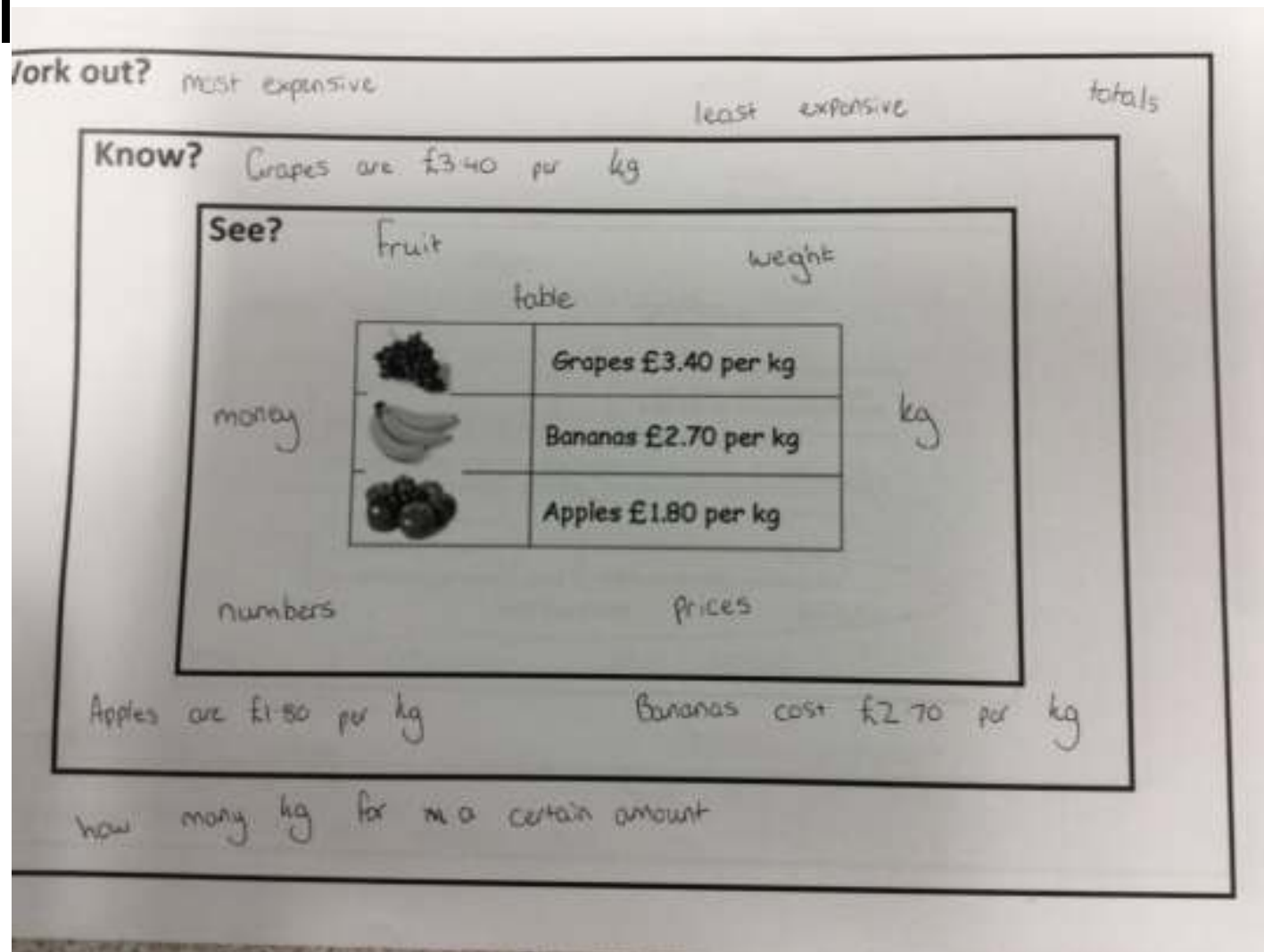
Did Laura make a profit on her original investment or did she make a loss?

You must show all your working and state how much profit or loss Laura made.

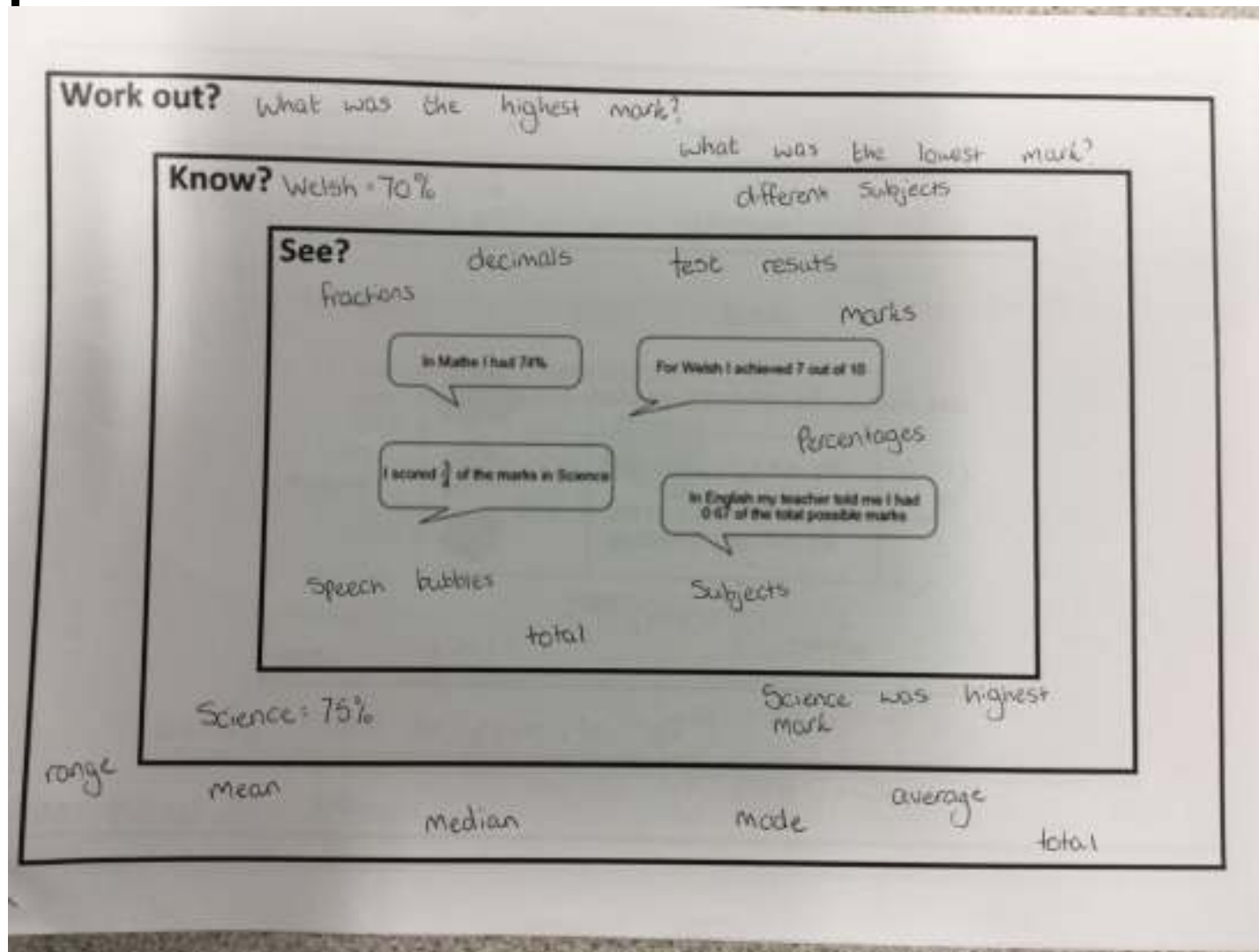
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Departmental gains

- KS4 - Level 2 Mathematics results highest ever – 54%
- KS3 – Level 5+ highest results ever - 82%
- Consistent teaching and learning throughout the department
- Improved quality of questioning

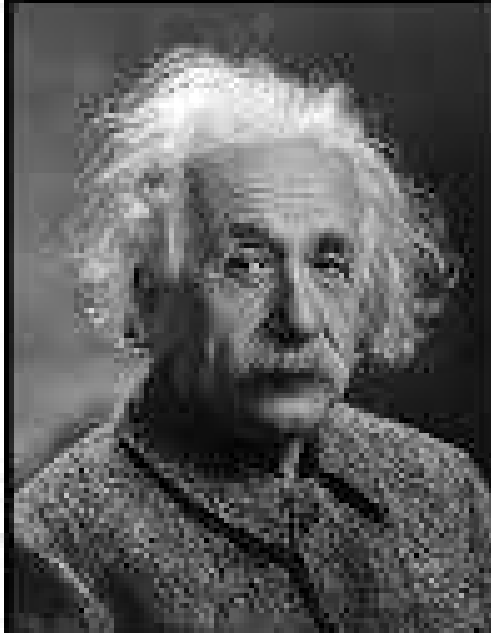


Pupil gains

- Encourage initiative - Independent learners
- Improve confidence when tackling problem solving questions
- Change of culture for a better learning experience
- Increased self esteem



Developing Resilience



It's not that I'm so smart, it's just that I stay
with problems longer.

(Albert Einstein)

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