

The background features a light gray gradient with several realistic water droplets of various sizes scattered across the frame. A faint, large circular pattern is centered behind the text.

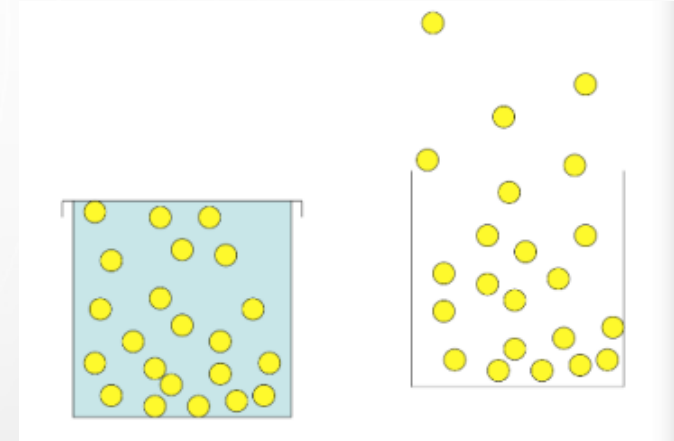
TEACHING TO THE TOP

CATERING FOR ALL LEARNERS

- Differentiated lessons, aims, objectives, activities, assessments.
A personalised curriculum for every student every lesson.
- Teach to the middle with extension question to hand if anyone finishes all the work... The top students will do fine anyway and keep themselves busy?

LEARNING WITHOUT LIMITS

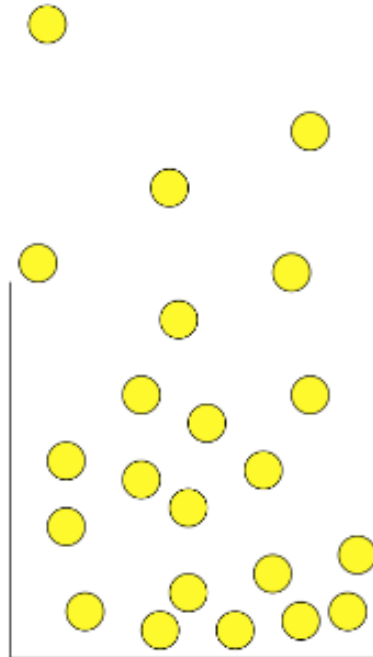
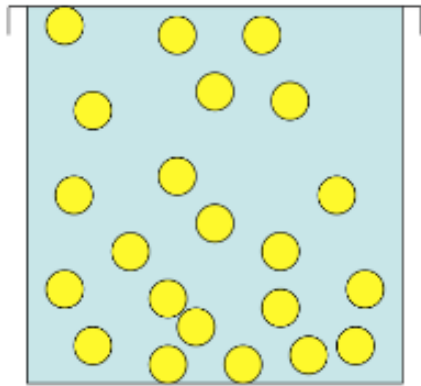
- As soon as you hold back the top end you are setting a limit on their achievement (and everyone else's too).
- Students internalise limitations we place on them.
 - "I didn't think I was allowed to add lines." (in a geometry question)
 - "I don't need to learn A grade topics because my target is a C."
- Pitch it up. Allow top students to set the standards for others to aspire to. Show what is possible. They raise their expectations and inspire others.



PITCH IT UP

Stretch and challenge – not just for the gifted.

- Have high expectations of what students can achieve.
- Meet the needs of **all** students. Everyone is aiming for the same high level - it's just that some may find it harder to reach and need stepping stones along the way.
- Embed challenge into every lesson.



The Pygmalion effect

- Robert Rosenthal and Lenore Jacobson - research in the 1960s
- showed that when teachers expected an enhanced performance from their students, their students' performance was indeed enhanced. Their work supported the idea that reality can be positively or negatively influenced by other people's expectations. In other words, **the higher the expectations you have of somebody, the better they perform.**
- Gave students an IQ test and without disclosing the scores, told teachers the names of about 20 per cent of students chosen at random and told them they were expected to do better than their classmates.
- At the end of the study all the students were tested again using the same IQ test. Every student had increased their IQ scores. However, the chosen 20 per cent (chosen at random, remember) showed statistically significant gains.

What do high expectations look like?

- Simple positive language to express expectation that a student will now complete a task.
“You’re almost there. Can you find the last piece?”
- Ensure students answer the question that was asked and that students use precise, technical vocabulary.
- Give it depth - learning does not end with a right answer
 - follow-up questions that extend knowledge and test for reliability.
 - Ask how or why, ask for another way to answer, ask for a better word, ask for evidence, ask students to integrate a related skill, and/or ask students to apply the same skill in a new setting.

“Is there a different way we could have found that angle?” “Why is that the answer?”

Always expect more.

•CHALLENGE!

HAVE HIGH EXPECTATIONS:

Example: The language of Mathematics

Before we can multiply decimals we need to be able to multiply integers. Calculate:....

Student: 'You need the same number on the bottom'

Me: 'Excellent! What is the mathematical word for the number on the bottom?'

Student: 'Denominator'

Me: 'Well done. Now try telling us your answer again in an even better way.'

Student: 'You need the denominators to be the same.'

Me: Well done, much more mathematical!

WHAT IS CHALLENGE?

Challenge is being faced with something that requires great effort in order to be successful.

All students don't need to be successful at everything all of the time.

ENCOURAGE RESILIENCE, PERSEVERANCE.

HELP STUDENTS TO NORMALISE 'FAILURE'. MODEL IT!

Oops, find my mistake here. This is how I try to avoid those...

WAYS TO PLAN CHALLENGE

Students don't always need to be successful. Learning is a process not just an outcome.

- THINK, PAIR, SHARE – good way to dispel the fear of failure. Plenty of time for thinking and for students to struggle with a question.
- FINAL CHALLENGE – A difficult question to finish the lesson that is beyond what you might expect some of the class to manage. They are all motivated to try and anything they manage towards the answer/solution is an achievement.
- SELF DIRECTED PROGRAM – Students choose which questions they should answer to ensure a challenge level.

CHALLENGE OF THE DAY

Not sure?- Qu 1-10
Think I've got this – Qu 5-15
Fully confident - Qu 11-20

$$abc^3(b - a^2b)$$





1. $2x + 5 = 11$

2. $3x + 6 = 24$

3. $7x + 3 = 38$

4. $3x + 2 = 14$

5. $8x + 8 = 24$

6. $9x - 5 = 85$

7. $5x + 6 = 26$

8. $2x - 7 = 14$

9. $3x - 2 = 22$

10. $4x + 1 = 45$

1. $\frac{x}{3} + 4 = 9$

2. $\frac{x}{5} + 7 = 14$

3. $\frac{x}{2} + 5 = 9$

4. $\frac{x}{8} - 3 = 8$

5. $\frac{x}{9} + 9 = 12$

6. $\frac{x}{2} - 8 = 2$

(a) $2(y + 2) = 8$

(b) $3(a + 2) = 12$

(c) $4(x - 4) = 40$

(d) $5(c - 3) = 35$

(e) $7(3 + a) = 49$

(f) $6(-2 + x) = 36$

(g) $6(6 + p) = 48$

(h) $9(x + 4) = 18$

(i) $4(a + 6) = 4$

(j) $8(3 + m) = 8$

You must complete at least 2 questions from the **safe zone** to move on to the **risk zone**.

You must complete at least 2 questions from the **risk zone** to move on to the **danger zone**.

WAYS TO PLAN CHALLENGE

Students don't always need to be successful. Learning is a process not just an outcome.

- THINK, PAIR, SHARE – help the fear of failure. Plenty of time for thinking and for sharing.
- FINISH THE LESSON – help to finish the lesson that is beyond what you might expect. They are all motivated to try and anything is an achievement.
- SELF-SELECTED QUESTIONS – get used to selecting which questions they should be working at the optimal challenge level.
- THROUGH TO THE DEEP END – brief overview of task and students encouraged to figure it out for themselves. Does require a bit of training!
- DEPTH – Why is that the answer? Could you explain it to some one who has missed the lesson?
- GRAFFITI TIME
- OPEN ENDED TASKS/PROBLEM SOLVING – intrinsic group motivation. Group roles.



TIME

PROBLEM SOLVING AND GROUP WORK

- GROUP ROLES – to keep all students engaged and involved in the process.
- RECIPROCAL LEARNING through discussion. Explaining to each other. Back and forth.
- Group work skills need to be taught and developed.
- Plan your prompts in advance. Make them questions. Are there any triangles? What lengths do you know? What lengths can you find?

[Great document on these from Nrich](#)

Understanding coordinator

Make sure that calculations are checked and mathematical reasoning is justified. Make sure the group is making connections between ideas.

“Has somebody double-checked that calculation?”

“Does everyone understand the explanation?”

“Can everyone explain that bit of mathematics?”

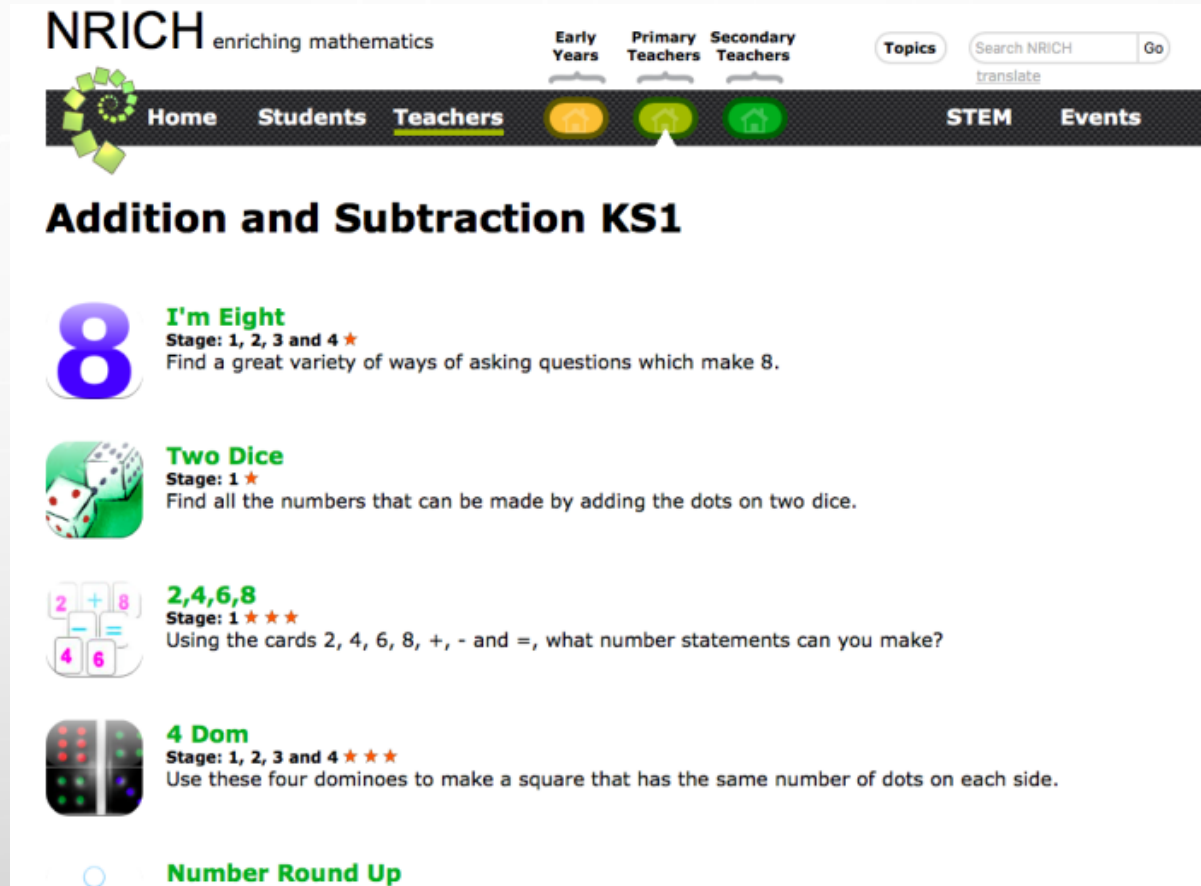
“How do we know this makes sense – how can we convince others?”

“Are we sure about that? Tell me why... What if...?”

[Nrich – building team working skills](#)

WHERE TO LOOK – Maths

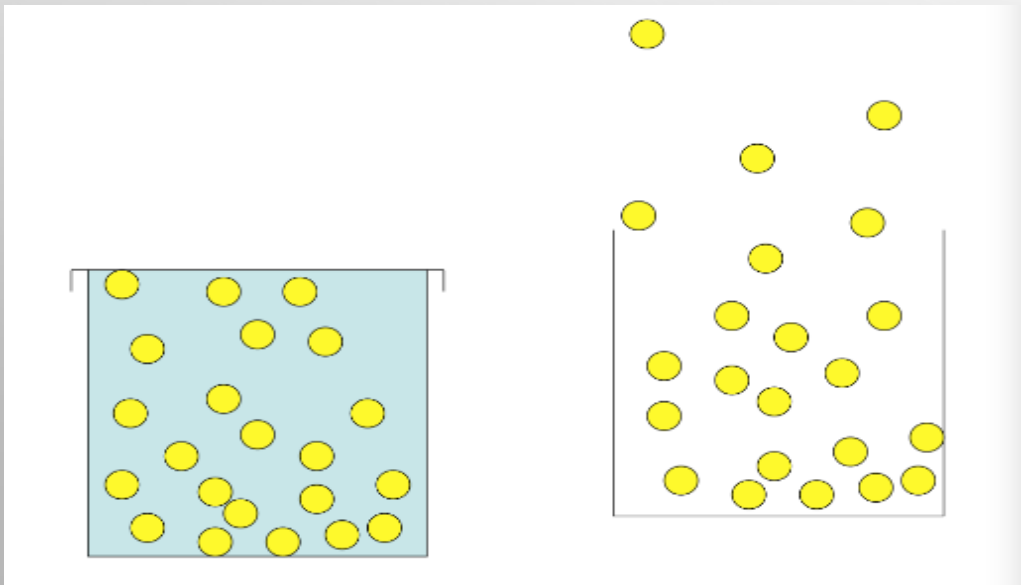
- [NRICH](#) – many excellent curriculum linked problems and tasks for both primary and secondary
- [DR FROST](#) (resources for secondary level often utilising UKMT questions)
- [FMSP](#) – mostly KS5 resources but some GCSE problem solving materials (and year 10 team challenge materials).
- [UKMT](#) – Individual challenges as well as team challenge materials. More past paper questions available [here](#).



The screenshot shows the NRICH website interface. At the top, the logo 'NRICH enriching mathematics' is displayed. Navigation links for 'Early Years', 'Primary Teachers', and 'Secondary Teachers' are visible, along with a search bar and a 'Go' button. A dark navigation bar contains 'Home', 'Students', and 'Teachers' (which is highlighted), and 'STEM' and 'Events' are also present. The main content area is titled 'Addition and Subtraction KS1' and lists several resources:

- I'm Eight**: Stage: 1, 2, 3 and 4 ★. Find a great variety of ways of asking questions which make 8.
- Two Dice**: Stage: 1 ★. Find all the numbers that can be made by adding the dots on two dice.
- 2,4,6,8**: Stage: 1 ★ ★ ★. Using the cards 2, 4, 6, 8, +, - and =, what number statements can you make?
- 4 Dom**: Stage: 1, 2, 3 and 4 ★ ★ ★. Use these four dominoes to make a square that has the same number of dots on each side.
- Number Round Up**: (partially visible)

- Have high expectations of all students
- Embed challenge with support, prompts and scaffolding where necessary.
- Encourage and praise resilience!



**WATCH THEM RISE TO THE
CHALLENGE!**

