PROBLEM SOLVING IN THE PRIMARY CLASSROOM

NEW NC FOR MATHS – PURPOSE OF STUDY

Mathematics is a **creative and highly inter-connected** discipline that has been developed over centuries, providing the solution to some of history's **most intriguing problems**. **It is essential to everyday life,** critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability **to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject**

Great news

This message is crucial

Think of 3 questions to ask your class

SOLVERS AND POSERS?

What opportunities do you give your children to pose the questions?

THESE 3 AIMS PROVIDE A STRUCTURE FOR THE DELIVERY OF THE YEARLY CONTENT OF THE NEW CURRICULUM – REPLACING MA1 (U&A) NC 1999

AIMS: The national curriculum for mathematics aims to ensure that all pupils

- become fluent … so that pupils have **conceptual understanding** and are able to recall and apply their knowledge rapidly and accurately to problems
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

'a common clear emphasis in training on problem solving was not reflected in trainees' teaching or, too often, in the teaching within the school. Some trainees said that they had not observed teachers teaching problem solving'. Ofsted (2013)

Teachers must not go through the Yearly NC content, using a tick list approach

WILLIAMS INDEPENDENT REVIEW (2008:62)

'Clearly, if children's interests are not kindled through using and applying mathematics in interesting and engaging ways, and through learning across the full mathematics curriculum, they are unlikely to develop good attitudes to the subject'.

WHAT IS A 'RICH' ACTIVITY?

'Eggs in the basket'

http://nrich.maths.org/2002&part=

Consider the subject knowledge and pedagogy

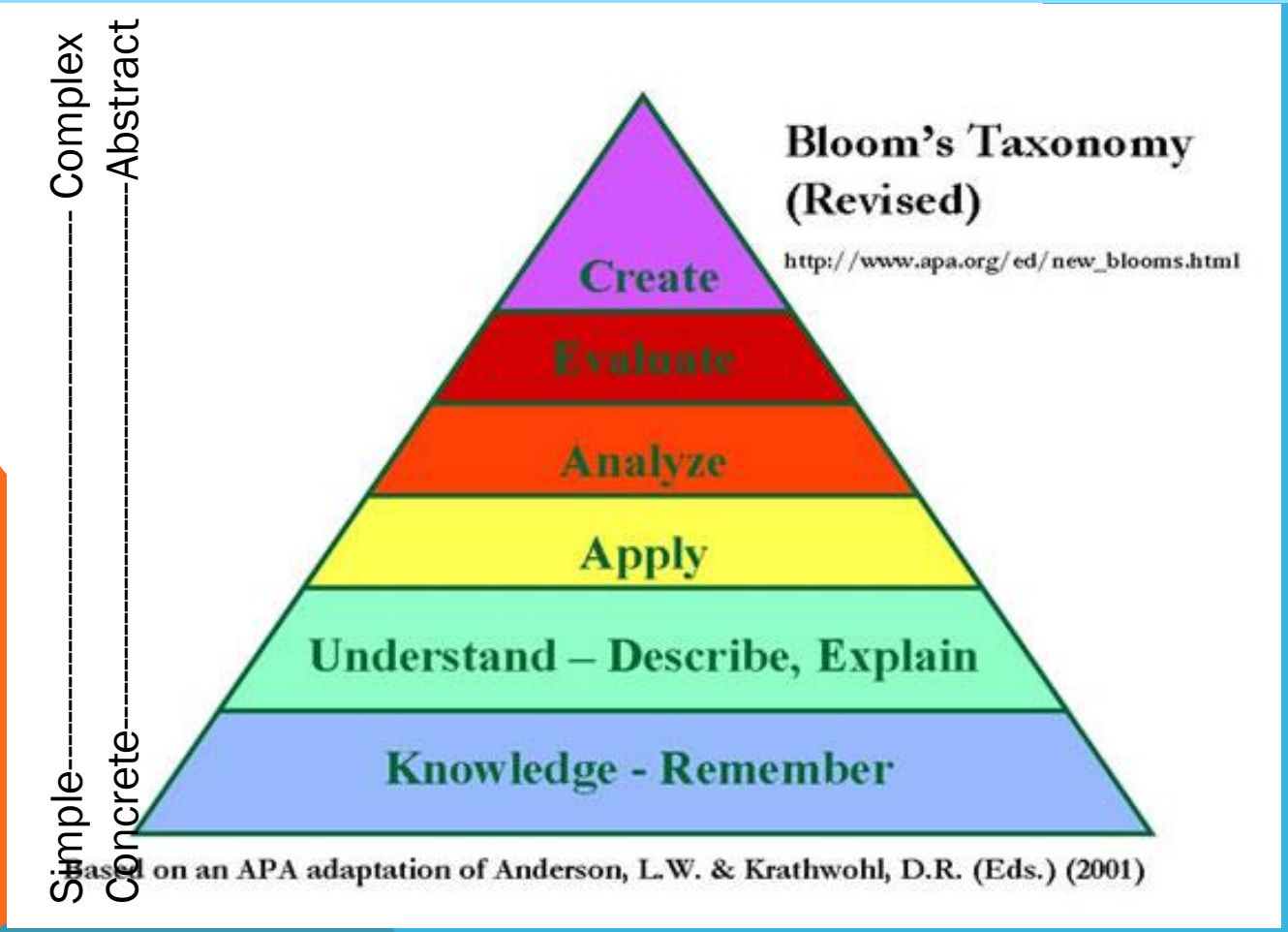
What do you think makes an activity RICH?

Now check this activity against the NRICH criteria

Children should 'develop their understanding through speculating, hypothesising and exploring ideas'. (NC 2013:10)

RICH TASKS LEAD TO HIGHER ORDER THINKING SKILLS

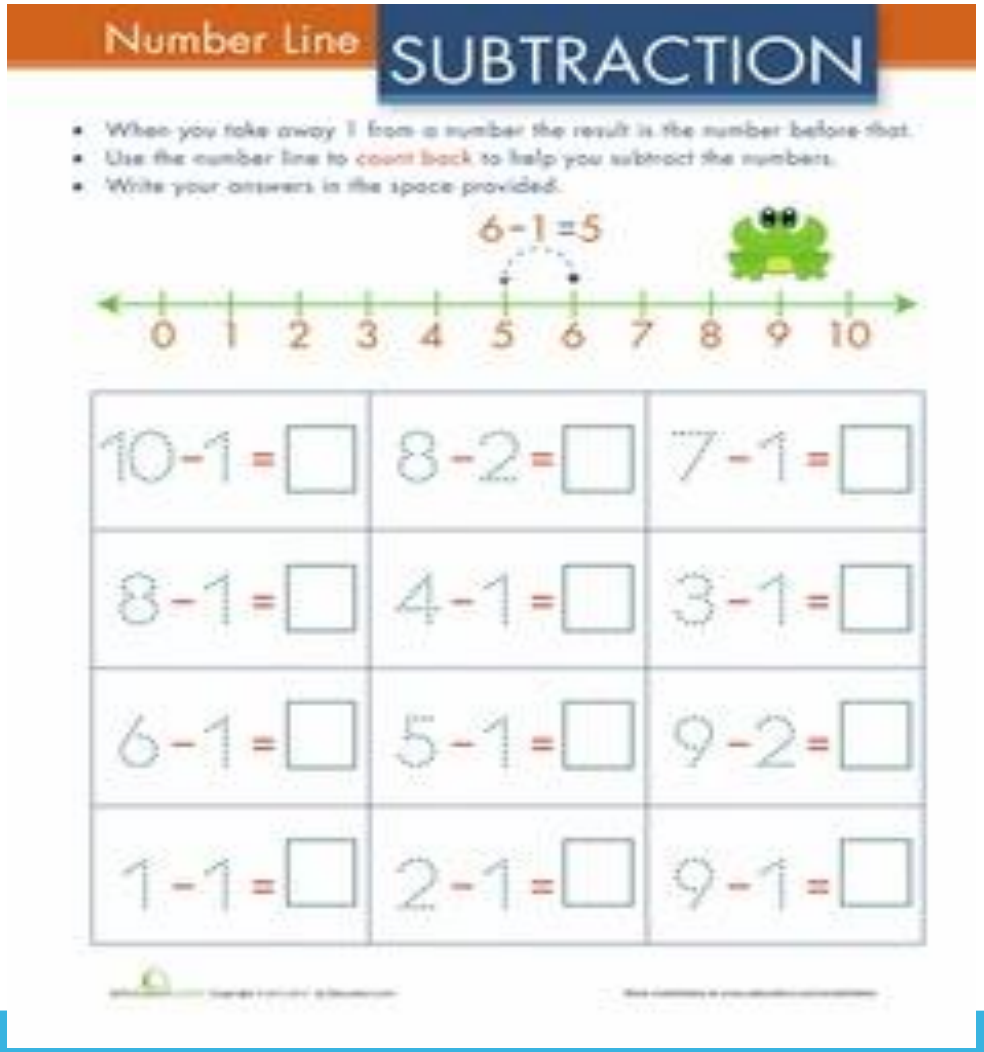
HOTS



Now let's try the HOTS activity

It’s not uncommon to see this type of maths worksheet used in classrooms.

Is it RICH?
Look at the criteria in your envelopes again



Roman Numerals in the new NC
A problem solving approach

Promoting Improvements in ITE (Ofsted 2013)

Key areas for development:

‘Although problem solving and application of mathematics in real-life contexts form part of most trainees’ training, and were observed in some lessons, trainees’ ability to plan explicitly for and assess the skills is limited’

Planning for Progression

1. NRICH http://nrich.maths.org/5665

2. NCETM https://www.ncetm.org.uk/resources/42990

3. Strategies materials still very useful – linked to NC 1999

http://nrich.maths.org/8112

nrich
Specialists in rich mathematics

Andy's Marbles

Andy and Sam were walking along the road when Andy's bag of marbles split and all the marbles spilled out!

One third of the marbles rolled down the slope.
One sixth of them disappeared down a drain.
Half of the remaining marbles were taken by other children.

Andy counted all the marbles Sam had helped him rescue and gave one third of these to Sam for helping pick them up.
Andy was left with 14 marbles.

How many marbles did Andy have before his bag split?

Thousands more problems can be found on the NRICH Maths website:

www.nrich.maths.org

ICT TOOL FOR CONCEPTUAL UNDERSTANDING THINKING BLOCKS … HAVE A GO!

Linked to Singapore Bar Method -a progressive resource used to develop conceptual understanding

http://www.youtube.com/watch?v=7bPjWu3fluo

http://www.thinkingblocks.com/tb_modeling_tool/modeling_tool.html

http://www.thinkingblocks.com/ (APP for ipad)

KEY ASPECTS OF LEARNING

Essential Processes for the teaching and learning of mathematics			
Social skills	Communication	Motivation	Empathy
Enquiry	Problem Solving	Reasoning	Creative thinking
Information Processing	Evaluation	Self-awareness	Managing feeling
Representing	Analysing	Interpretation	Reflecting

Essential Processes

Interpreting-representing-analysising-conjucturing-reasoning-inducing-deducing-generalising

SO GOOD MATHEMATICS TEACHING SHOULD BE...

RICH AND HOT!

Are you interested in becoming more of a specialist in primary mathematics?

In September 2015 you can begin an M level course to become a GREENWICH MATHS SPECIALIST TEACHER (GMaST)

Email me in September to register your interest j.field@gre.ac.uk