

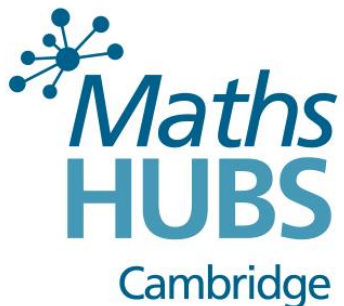
Problem Solving and Reasoning

session 1

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Aims of the 3 sessions

- ▶ Session 1 - What is NRICH?
NRICH as a tool for planning and teaching. Problem solving and reasoning in the National Curriculum.
Gap Task.
- ▶ Session 2 - Reflection on the Gap Task.
NRICH planning looking at your medium term plan, adapting to incorporate fluency and reasoning.
Second Gap Task.
- ▶ Session 3 - Reflection on the Second Gap Task.
Ways forward.

Aims of the Session

- ▶ What is NRICH? How can we use NRICH to support us?
- ▶ Exploring NRICH as a tool for planning and teaching, linked to the National Curriculum for problem solving and reasoning.
- ▶ Trying out an NRICH activity focusing on problem solving and reasoning which the children will use. Then use an activity for the gap task.

Two-digit Target

► <http://nrich.maths.org/6343>

You have a set of the digits from 0 - 9.

0	1	2	3	4	5	6	7	8	9
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Can you arrange these digits in the five boxes below to make two-digit numbers as close to the targets as possible? You may use each digit once only.

largest even number

largest odd number

smallest odd number

largest multiple of 5

number closest to 50

NRICH

- ▶ NRICH promotes the learning of mathematics through problem solving.
- ▶ At NRICH they believe that:
 - ▶ The activities can provoke mathematical thinking.
 - ▶ Students can learn by exploring, noticing and discussing.
 - ▶ This can lead to conjecturing, explaining, generalising, convincing and proof.
 - ▶ In a classroom, the students' role is to focus on the mathematics while the teacher focusses on the learners.
 - ▶ The teacher should aim to do for students only what they cannot yet do for themselves.

National Curriculum

- ▶ Problem Solving and the New Curriculum article by Lynne McClure.
- ▶ The national curriculum for mathematics aims to ensure that all pupils:
 - become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
 - **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.

Noah

- ▶ <http://nrich.maths.org/136>



Noah watched the animals going into the ark.
He was counting the legs of the animals and by noon he got to 12.
How many creatures did he see?
See if you can find other answers.
Try to tell someone how you found out these answers.

Primary Curriculum Map

- ▶ Nrich have produced an interactive document that has suggested tasks relating to year group and strands.
- ▶ Nrich suggest you use this documents online for easy access of the activities through the hyperlink.
- ▶ Remember these are only suggestions and most tasks can be easily adapted for another year group.

Reasoned Rounding

► <http://nrich.maths.org/10945>

The first player rolls a 0-9 die twice and chooses which two-digit number they would like to make from the numbers rolled.

They then have to round this to the nearest value of 10, find the matching circle on the recording sheet and write their two digit number in one of the spaces in that circle.

Player two rolls the die twice to take their turn in a similar way.

A circle is complete when it has two numbers in it and this scores a point for the person who wrote the **second number** in. (Even if the first number was written in by the other player.)

The game is over when all the circles are full and then the points are counted up to find the winner.

Gap Task

- ▶ Bring your medium term planning to the next session.
- ▶ Carry out the ‘Reasoned Rounding’ activity with your class and feed-back during the next session.