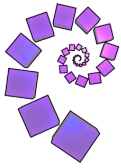


# Leadership for Learning Project 2017-18

Alison Borthwick [alb207@cam.ac.uk](mailto:alb207@cam.ac.uk)

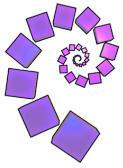
Fran Watson [fw279@cam.ac.uk](mailto:fw279@cam.ac.uk)

NRICH Primary Team



# Leadership for Learning Project 2017-18

Wednesday	4 <sup>th</sup> October	2017
	29 <sup>th</sup> November	
Tuesday	9 <sup>th</sup> January	2018
	6 <sup>th</sup> March	
Wednesday	18 <sup>th</sup> April	
	20 <sup>th</sup> June	



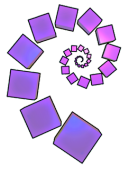
# 2016-7 Project Overview

Autumn term: Problem solving (2 days)

Spring term: Reasoning (2 days)

Summer term: Fluency (2 days)

[nrich.maths.org/towerhamlets](http://nrich.maths.org/towerhamlets)



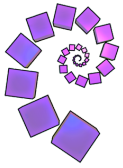
# Project Overview 2017-18

Having developing an understanding of the three aims, the focus this year will be on assessment of these.

Autumn term: Problem solving (2 days)

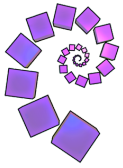
Spring term: Reasoning (2 days)

Summer term: Fluency (2 days)



# Introductions

- Name
- Role
- Setting
- Why you're here?

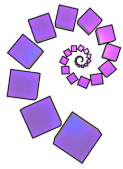


# Myths about problem solving?



# Different Types of Problems

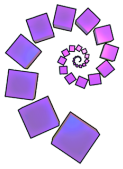
- Word problems
- Pictorial problems
- Abstract problems
- Fictitious problems
- Real life problems
- Problems involving measurement, time, geometry, money, manipulatives ...



# A Few Strategies

- Pattern spotting
- Working systematically
- Finding all the possibilities
- Using diagrams and pictorial information
- Working backwards
- Trail and improvement
- Visualising
- Conjecturing
- Using manipulatives





# Problem-solving Process

## 1. Getting started

try a simpler case

draw a diagram

represent with model

act it out

## 2. Working on the problem

visualise

work backwards

reason logically

conjecture

work systematically

look for a pattern

trial and improvement

## 3. Digging deeper

generalise

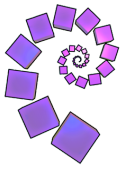
verify

prove

## 4. Concluding

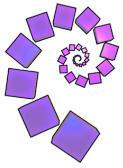
communicate findings

evaluate



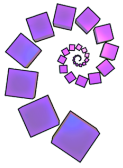
# A First Product Sudoku (5919)

							9	
			12					8
56			21			30		24
	72			5				
				7			12	
			5			18		
		10					63	
			35					45
					40			30
		27						
	21	9						
		6						
			36	12				



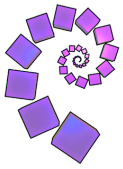
# Self assess

- How would you evaluate your work?
- How successful were you?
- Did anything surprise you?
- What would you do differently next time?



# Purpose of assessment?

- What is assessment?
- Why do we assess?
- How do we assess?
  
- What else should be assessed?

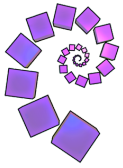


# Four Triangles Puzzle (141)

If you cut a square diagonally from corner to corner in both directions, you get four right-angled isosceles triangles.

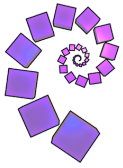


How many different shapes can you make using all 4 shapes each time?



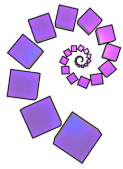
# Frameworks to facilitate

- Take 15 minutes on your table to familiarise yourselves with it and then with a partner use it as a rubric to evaluate the problem solving aspect of your work on the task.



# Frameworks on tables:

- ACME (Red)
- Bloom's Taxonomy (Orange)
- Cuoco, Goldberg and Mark (Green)
- Kilpatrick et al's Rope model (Blue)



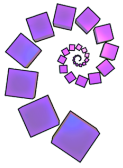
# Rainbow cascade

Now re-group so that each table has a **Red**, **Orange**, **Green** and **Blue** contributor.

Discuss your findings.

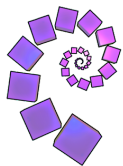
Note down a strength and limitation of each framework on post-its.





# Customised

- Opportunity for a bespoke template
- Framework/template/rubric

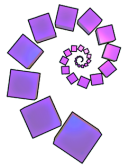


# Magic Vs (6274)

1. Place each of the numbers 1-5 in the V shape so that the arms of the V have the same total.

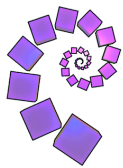


2. How many different possibilities are there?
3. How could you convince someone that you have found them all?

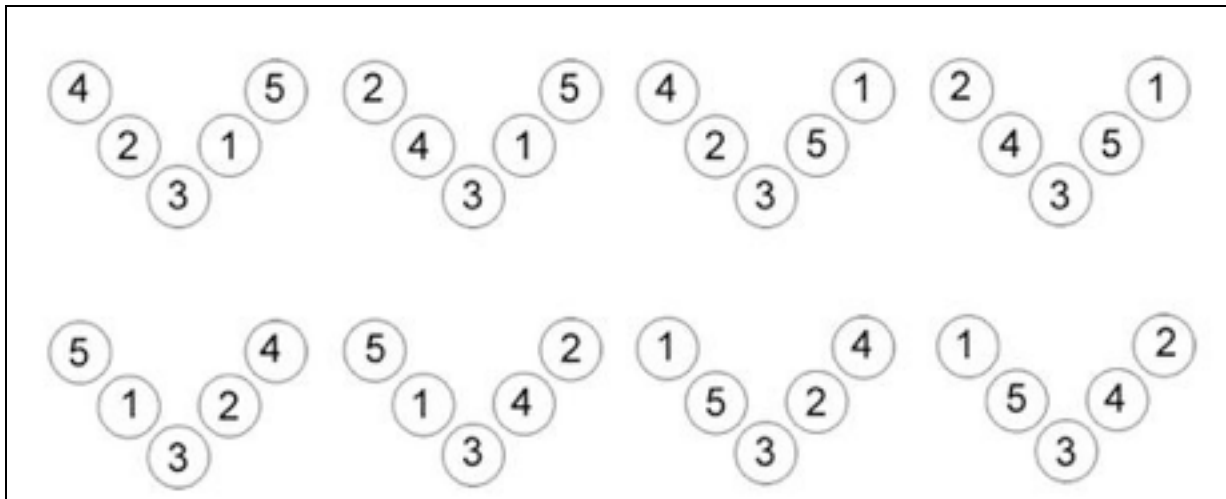
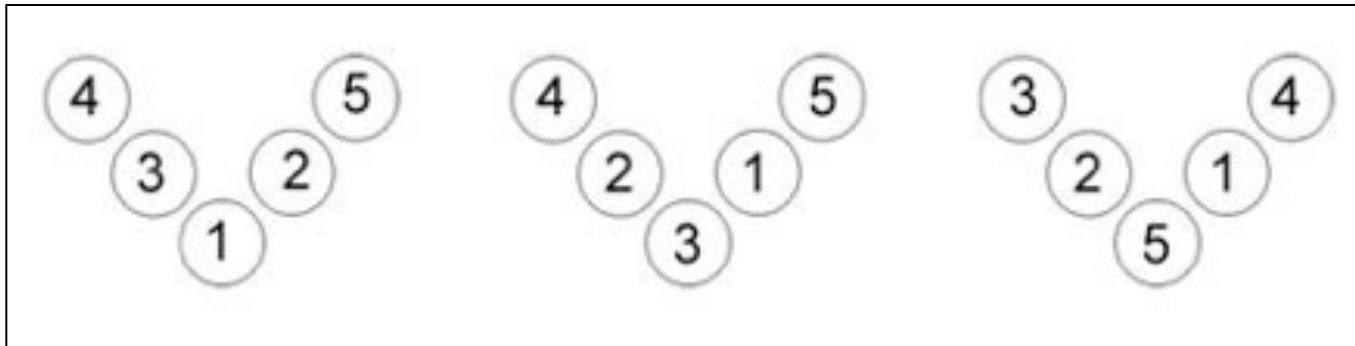


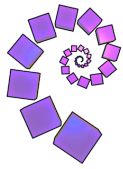
# Magic Vs

- What did you notice?
- Did anything surprise you?
- What would you do/ask next?



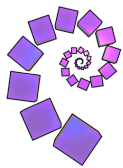
# Finding all solutions





# Share revisions

- How robust was your rubric? (problem solving not solely content)
- What changes did you make and why?



# Teacher takeaway

1. Try the Four Triangles Puzzle (141)
2. Try **either** Magic Vs (6274) **or** Money Bags (1116)
3. Use your rubric to assess the two tasks
4. Reflect on your assessment
5. Bring some children's work, and your completed rubrics to Day 2 (29<sup>th</sup> November)