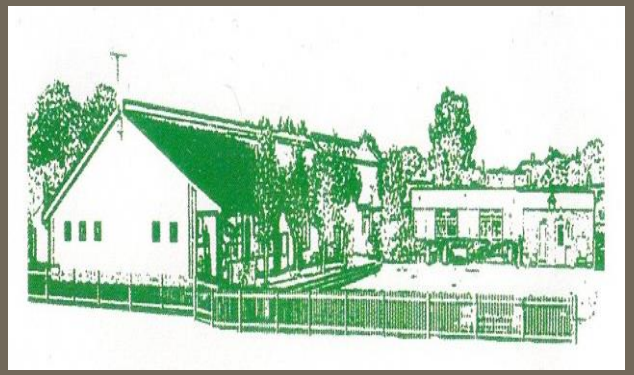
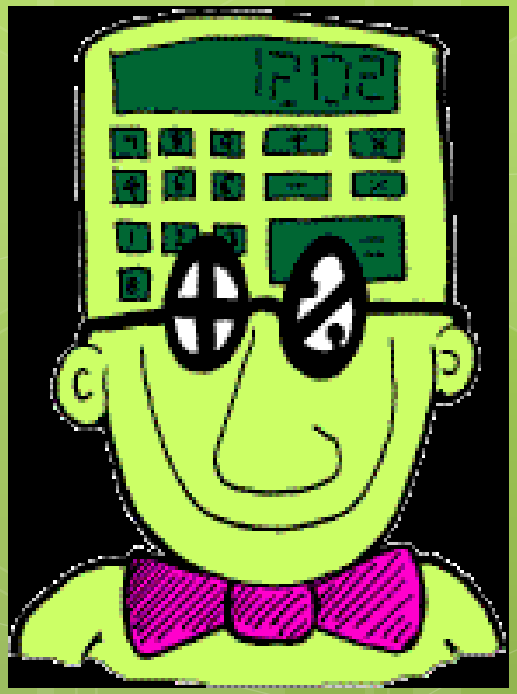
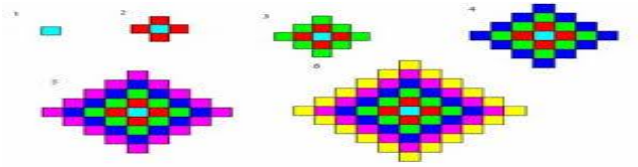




Dorney Maths

Investigations and problem solving



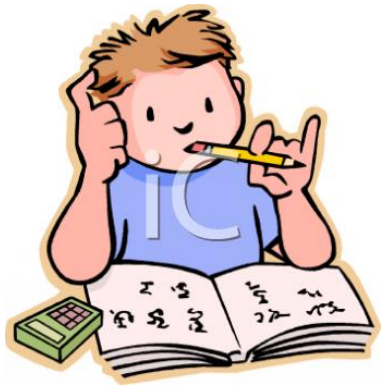
What is an investigation?

- First of all, what investigative maths isn't ! It's not the same thing as practical work (though practical work may be involved) – and it's not just a different sort of problem-solving.
- In investigative maths, children are given a starting-point and some clear procedures to try out but they usually have no idea at the outset what sort of results they're going to get.

- This is where the interest comes. Good investigations generate patterns of different sorts and it's these patterns we want children to look for and identify in their results

Why should children do investigations ?

- Maths is not a fixed body of knowledge.
- Room for imagination and creative thinking.
- More than just one right answer.
- More than one approach.
- This approach is motivational and engages pupils.



What strategies can they use?

- Solve a simpler related problem
- See mathematical connections
- Make a list, table or chart
- Use trial and improvement
- Look for important words or phrases
- Make a drawing or model
- Work backward
- Look for a pattern or sequence
- Make and test a prediction
- Account for all possibilities
- ? B B4 B…

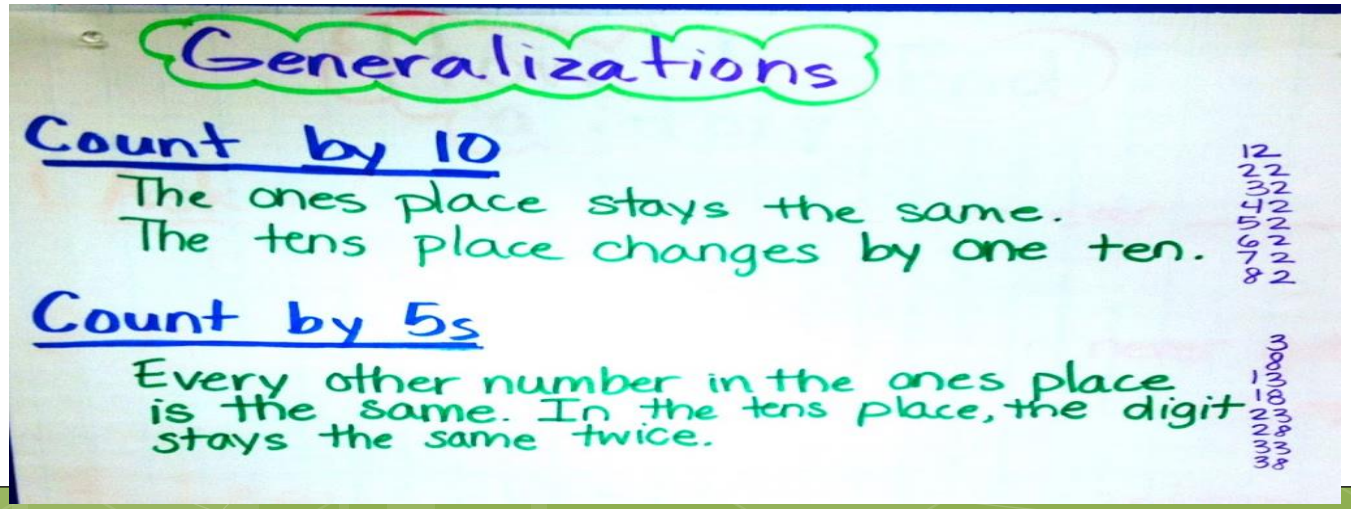
How can they record their findings?

- Tally chart
- Notes
- Photo/video
- Post-it note
- Graph, e.g. bar
- What else?

What are generalisations?

- Click here for an example…

- A rule that explains a pattern seen in a set of numbers …



What do children need ?

- Vocabulary – to allow them to explain a pattern by generalising.
- Be able to interpret a question – underline key words etc
- Mathematical skills – 4 operations, place value, time tables…
- Strategies- as mentioned (slide 5)
- Time and resources. E.g. scales… metre stick
- Engagement and motivation…

Questions to ask during investigations

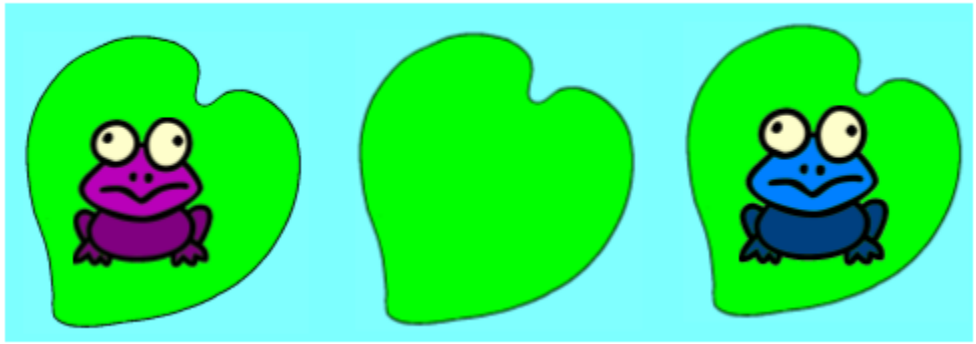
How could you sort these.....?
How many ways can you find to ..... ?
What happens when we ..... ?
What is the same?
What is different?
Can you see a pattern?
What do think comes next? Why?
Is there a way to record what you've found that might help us see more patterns?
What would happen if....?

What have you discovered?
How did you find that out?
Why do you think that?
What made you decide to do it that way?

Who has the same answer/ pattern/ grouping as this?
Who has a different solution?
Are everybody's results the same?
Why/why not?
Have we found all the possibilities?
How do we know?
Have you thought of another way this could be done?
Do you think we have found the best solution?

How can you help at home?

- Investigations you have done…
- Ideas/contributions…



Where can you find investigations?

- Doing the shopping – estimate/calculate the best deal – save some money
- In the car – estimate time of arrival (ETA)
- Nrich
- Maths Warriors – coming soon!

- Transum investigations

Remember Einstein – he turned failure into learning after testing more than 1500 light bulbs….