

Broadoak School Numeracy Policy

Vision

At Broadoak School we seek excellence for all our pupils, within the context of a caring and mutually supportive partnership between governors, staff, pupils and parents. We fully recognise that, by its expansive nature, numeracy must take account of prior learning experiences, future curriculum selections and special educational needs. This policy must be read in conjunction with the following policies:

- Assessment Policy
- Behaviour Policy
- Performance Management policy
- Special Needs Policy
- Target Setting Policy
- Teaching and Learning Policy

Aim

The purpose of this policy is to ensure that:

- The delivery of numeracy is tailored to meet the needs and abilities of pupils within each curriculum area.
- Provide a specific numeracy slot on a weekly basis that can be delivered by a non-specialist during a specific form time slot.
- Staff are provided with scaffolded activities to support their planning and delivery.
- Staff development should build upon and develop from the evaluation of these scaffolded activities. Opportunities are available for staff to share how they have developed numeracy within their subject area.

Practice

To realise the school's vision, numeracy is expected to:

- Be relevant across all subject areas.
- Not necessarily be linked to the concept of being 'numerate' in every lesson.
- Promote the concept of 'mathematical thinking' across all subject areas (Annex A).
- Provide generic structured activities to develop mathematical thinking that are applicable all curriculum areas.
- Be easily editable and adaptable with these structured activities to meet the objective of lessons and also to provide additional levels of differentiation.
- Move away from artificial and contrived scenarios such as counting the number of lines in a poem or calculating the amount of paint needed to cover a canvass.
- Maintain high levels of learner involvement and interest in tasks.
- Not necessarily make it explicit to pupils that they are thinking mathematically.
- Provide numeracy specific activities on a weekly basis to all form groups at Key Stage 3.
- Measure and assess the success of the strategy on a half termly basis.

Roles and Responsibilities

The **Headteacher/Principal** will ensure that:

- The Numeracy Policy is readily available and actively promoted
- All staff understand their role in promoting effective Numeracy and receive appropriate support, training and resources from the Mathematics Department.
- The policy and its procedures are followed

The **Assistant Principal for Pupil Progress** will ensure that:

- Practice in school supports the vision and procedures outlined in the policy
- Appropriate training is undertaken in order to support staff in carrying out their numeracy responsibilities
- Continues assistance with termly work scrutinies and drop ins evidence the use of various numeracy strategies within lessons. The findings of these are used to inform and direct on any areas of strength or development that may need addressing.
- Monitoring and assessment of the impact of this policy takes place
- An annual report is prepared for governors outlining the action taken within the preceding year and evaluating the impact of that action

All staff will ensure that:

- They have read the policy and understand their responsibilities
- They promote the core values outlined by the policy

Updated: July 2017

Review date: July 2020

Annex A: How to promote 'Mathematical Thinking'

1. Sequencing

In order to help students think systematically, logically and to break down problems into smaller parts it helps to see things sequentially; for example Six Degrees of Separation (or The Kevin Bacon Game as it's sometimes known). This is based on the theory that every human being in the world is connected to every other human being through a chain of no more than six people. The idea is that pupils need to logically sequence their understanding from one concept to another. Teachers could provide pupils with a prompt connected to the topic they are studying and give them an end point they have to connect to and get them to sequence what they know:

1. Select a topic or theme.
2. Write 1–6 along a timeline.
3. Put your topic at number 6.
4. Get from the stimulus to the selected topic in no more or less than six steps.

Students might be asked to suggest the six degrees of separation between the assassination of Archduke Ferdinand and the outbreak of the Great War, or between Pip's first meeting with Magwitch and his discovery that he has 'great expectations'. The chain can be expanded or contracted to provide differentiation within a task.

2. Asking mathematical questions

In the majority of subjects there are times when we want students to consider what they're learning about in a mathematical way. It might therefore be useful to ask them to frame questions about curriculum content in mathematical terms:

- How could you sort these.....?
- How many ways can you find to ?
- What happens when we ?
- How many different can be found?
- What is the same/different?
- Can you group these in some way?
- Is there a pattern?
- How can this pattern help you find an answer?
- 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....?

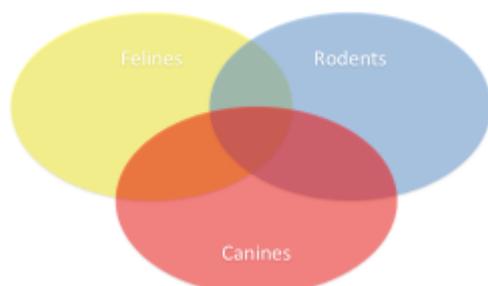
3. Domain specific thinking

These are aimed at helping pupils to think about subject content using the tools of mathematics:

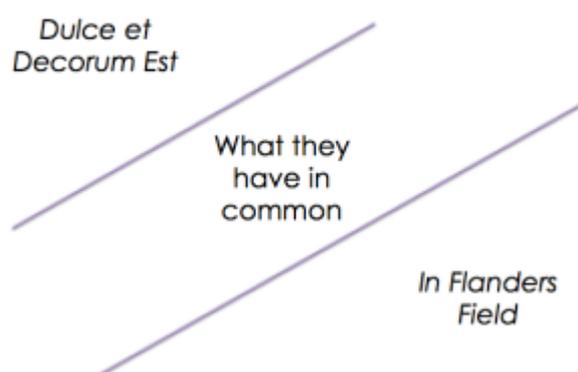
- specialising – trying special cases, looking at examples
- generalising – looking for patterns and relationships
- conjecturing – predicting relationships and results
- convincing – finding and communicating reasons why something is true.

4. Organising information

The Venn Diagram useful way to organise and present information across a range of subjects.



However, the overlapping space can be too cramped to contain much writing. An alternative is to use Comparison Alley where information is organised in such a way that there's plenty of space to make the comparison:

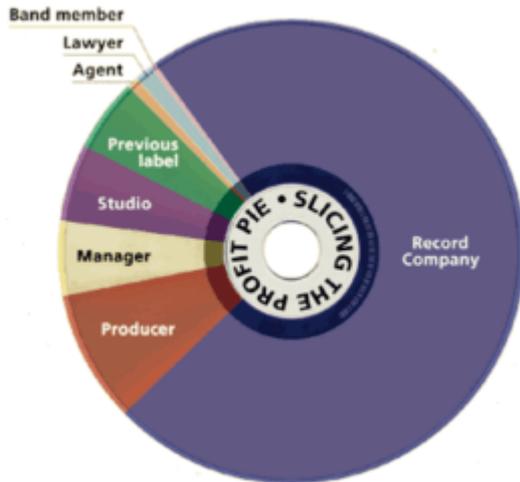
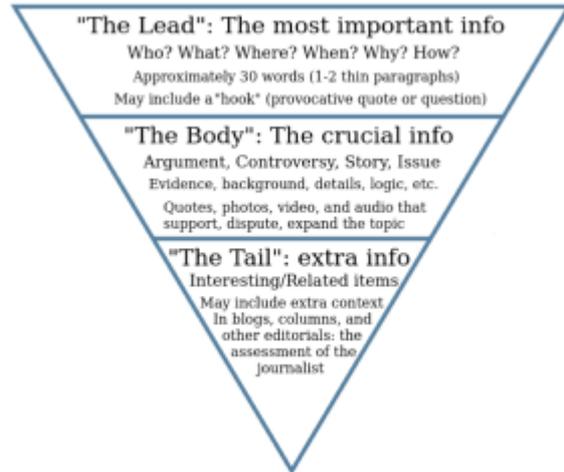
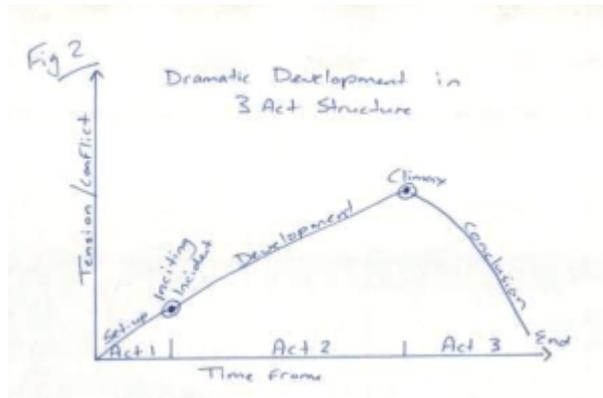


5. Presenting information

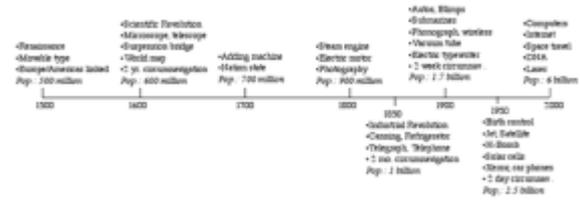
Mathematics provides new and useful ways of seeing the world. Many if not most subject areas can find space to expand students' thinking by asking them to express their understanding using the tools of mathematics.

- Graphs
- Timelines
- Flow charts
- Graphic organisers
- Pie charts

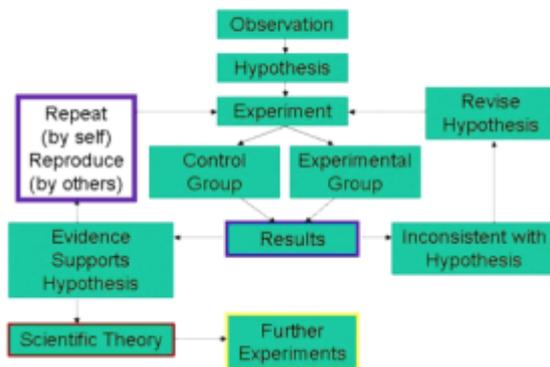
Below are examples from different subjects:



Human History Timeline: 500 Years



The Scientific Method

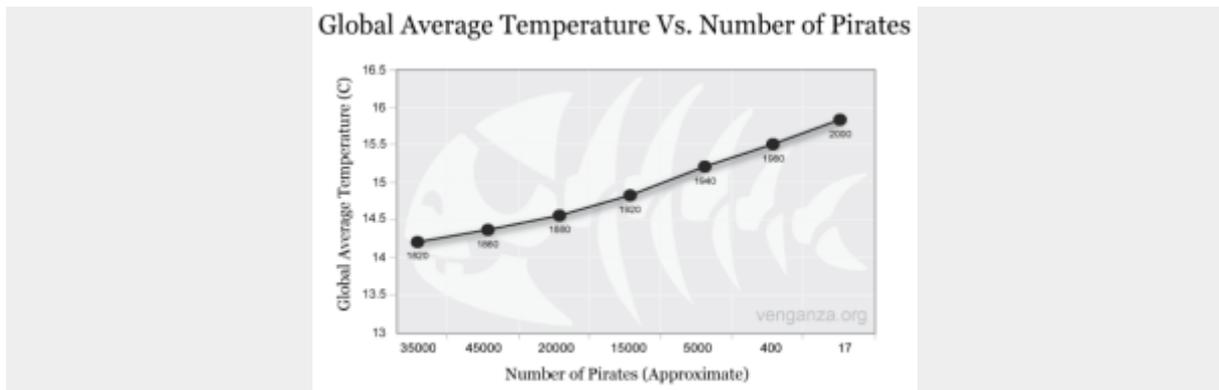


6. Seeing relationships

Understanding how big something is in relation to something else can be important in all sorts of lessons. Another area where pupils might benefit from mathematical thinking is scale. A favourite example is encouraging pupils to contemplate how big a billion is:

- A million seconds = 11 ½ days
 - A billion seconds = 32 years
- Or maybe these examples could be useful:

It's also worth considering the mistakes that can be made when trying to establish patterns. For example, correlation and causation are not necessarily linked.



7. Accuracy

Mathematics can also encourage pupils to pay attention to detail and understand the difference between completing a task and completing a task accurately. This concept of 'error checking' can be applied across the curriculum at appropriate points in a scheme of work. This can include dates in history, notation in music, learning lines in drama and punctuation in English.