

Thornby Hall School

Mathematics Policy

Introduction

This document is a statement of the aims, principles and strategies for the teaching of mathematics at Thornby Hall School. The policy was written in September 2014 and will be reviewed on an annual basis.

Mathematics is a universal part of the human culture. It is the tool and language of commerce, engineering and other sciences including physics, computing and biology. It helps us recognise patterns and to understand the world around us. Mathematics plays a vital, often unseen, role in many aspects of modern life, for example;

- Space travel
- Safeguarding credit card details
- Modelling the spread of epidemics
- Predicting stock market prices
- Business decision making

Aims

The aims of teaching and learning mathematics are;

- To prepare pupils for careers and job prospects that are exciting, challenging and diverse in nature.
- To create and instil proficiency in problem solving skills, logical reasoning and flexible thinking.
- To impart good analytical and quantitative skills to our young people.

Teaching Strategies

Accelerated or individualized math: a system of having students work at different levels individually in one classroom. They progress by passing tests for each unit and move at their own pace.

Adjusted speech: teacher changes speech patterns to increase student comprehension.

Includes facing the students, paraphrasing often, clearly indicating most important ideas, limiting asides etc.

Curriculum Based Probe: having students solve 2-3 sheets of problems in a set amount of time assessing the same skill. Teacher counts the number of correctly written digits, finds the median correct digits per minute and then determines whether the student is at frustration, instructional, or mastery level.

Daily re-looping of previously learned material: A process of always bringing in previously learned material to build on each day so that students have a base knowledge to start with and so that learned structures are constantly reinforced.

Ecological approach/generate data from real life experiences to use in class: involves all aspects of a child's life, including classroom, family, neighbourhood, and community, in teaching the child useful life and educational skills.

Explicit timing: timing math seatwork in 30-minute trials that are used to help students become more automatic in math facts and more proficient in solving problems. Teacher compares correct problem per minute rate. The results are used to recycle materials and concepts.

Explicit vocabulary building through random recurrent assessments: Using brief assessments to help students build basic subject-specific vocabulary and also gauge student retention of subject-specific vocabulary.

Graphic organizers: visual displays to organize information into things like trees, flowcharts, webs, etc. These help students to consolidate information into a meaningful whole and they are used to improve comprehension of stories, organization of writing, and understanding of difficult concepts in word problems.

Model-lead-test strategy instruction (MLT): Three stage process for teaching students to independently use learning strategies:

- 1) Teacher models correct use of strategy.
- 2) Teacher leads students to practice correct use.
- 3) Teacher tests students' independent use of it. Once students attain a score of 80% correct on two consecutive tests, instruction on the strategy stops.

Monitoring of progress through group and individual achievement awareness charts; using charts to build awareness and motivation of progress for students. The emphasis here is on progress so even students working at different levels can chart significant gains.

EAL support: providing auditory or written content input to students.

Problem solving instruction: explicit instruction in the steps to solving a mathematical or science problem including understanding the question, identifying relevant and irrelevant information, choosing a plan to solve the problem, solving it, and checking answers.

Reciprocal peer tutoring (RPT) to improve math achievement: having students pair, choose a team goal to work toward, tutor each other on math problems, and then individually work a sheet of drill problems. Students get points for correct problems and work toward a goal.

Reinforcing math skills through games: Using games to follow-up a lesson in order to reinforce learned skills and use the skills in another context.

Student developed glossary: Students keep track of key content and concept words and define them in a log or series of worksheets that they keep with their text to refer to.

Students generate word problems: Have students create word problems for a specific math skill. Through the construction of a problem the students learn what to look for when solving word problems they are assigned.

Tactile, concrete experiences in math: Using three dimensional objects in math instruction such as geometrical shapes, coins, or blocks used to form various geometrical shapes.

Think-alouds: using explicit explanations of the steps of problem solving through teacher modelling metacognitive thought, for example reading a story aloud and stopping at points to think aloud about reading strategies/processes or, in math, demonstrating the thought process used in problem solving.

Homework

Homework is set as appropriate to support work done in the lesson.

Assessment.

- Targets to suggest how to improve work are regularly written in books and verbally explained.
- Pupils are encouraged to respond to written comments and targets in books with their own evaluations, to help clarify their learning and targets.
- Formal assessments take place with an exam week in school in either the first or second term.

Recording and Reporting.

Pupils receive formal written reports before each LAC review and two progress reports during the year. Records of pupils' work are kept in the subject teacher's planning file and the pupil's work folder. Pupil's progress is discussed as necessary with the keyworker.

Role of the Subject Coordinator.

The subject co-ordinator is responsible for planning, resourcing and the teaching of mathematics to all pupils.

Health and Safety Issues

All health and safety regulations are followed in accordance with the overall Thornby Hall Policy and individual risk assessments.

Resources

The department has a range of resources to include math games (both interactive and computer based) and a variety of books aimed at different levels.

Development Plan

- To continue building up text book resources across KS4.
- To write new schemes of work for GCSE maths.
- To familiarise myself with curriculum changes as from September 2014.
- To explore subscriptions to various maths resources websites to access a variety of suitable teaching and learning resources.