Numeracy Policy

Ethos

Newland School for Girls is committed to raising the standards of numeracy of all its pupils, so that they develop the ability to use numeracy skills effectively in all areas of the curriculum and employ these confidently within the demands made of further education, employment and adult life.

Definition

Numerate pupils:

- have a sense of the size of a number and where it fits into the number system
- read numbers accurately from a range of metres, dials and scales
- know basic number facts and recall them quickly and confidently
- use what is known to work out answers mentally
- calculate accurately and efficiently, both mentally and with pencil and paper, drawing on a range of strategies
- use a calculator and other ICT resources appropriately, efficiently and effectively
- make sense of number problems, recognise the operation(s) needed and are able to work confidently with numbers
- know when answers are reasonable and give results to an appropriate degree of accuracy
- understand and use correct mathematical notation and terminology.
- are able to explain methods, reasoning and conclusions
- use units of measurement of length, angle, mass, capacity and time; can suggest suitable units for measuring, make sensible estimates of measurements and measure accurately using a range of instruments.
- understand and use compound measures and rates
- use the concept of scale in geometrical drawings and maps
- can calculate simple perimeters, areas and volumes
- collect and record discrete and continuous data, draw and interpret tables, charts, diagrams and graphs and use them to make predictions
- are able to apply mathematical skills to solve problems in a variety of contexts

Aims

- To establish a clear understanding and consistent practice among staff in the development of pupils' mental skills, written methods of calculation and use of calculators
- To ensure that all staff take the responsibility of developing numerate pupils through consistent approaches
- To enable pupils to identify and use the most efficient strategy for calculations
- To develop pupils' competencies allowing them to cope with the numeracy demands made in different subjects and for them not to be held back in those subjects through a lack of mathematical knowledge or poor basic skills
- To assist the transfer of pupils' knowledge, skills and understanding between subjects
- To indicate areas for collaboration between subjects and processes for facilitating such collaboration

Objectives

By Year 9, pupils should:

- know or, where necessary, recall mathematical facts confidently
- know multiplication tables to ten
- calculate accurately and efficiently, both mentally and with pencil and paper, drawing on a range of calculation strategies
- use proportional reasoning to simplify and solve problems
- use calculators and other ICT resources appropriately and efficiently to solve mathematical problems, and select from the display the number of figures appropriate to the context of a calculation
- use simple formulae and substitute numbers in them
- measure and estimate measurements, choosing suitable units, and reading numbers correctly from a range of meters, dials and scales
- calculate simple perimeters, areas and volumes, recognising the degree of accuracy that can be achieved
- understand and use measures of time and speed, and rates such as £ per hour or miles per litre
- construct and interpret graphs, diagrams, charts and tables
- explain methods and justify reasoning and conclusions, using correct mathematical terms
- judge the reasonableness of solutions and check them when necessary
- give results to a degree of accuracy appropriate to the context

and be able to apply this knowledge in all curriculum areas

CALCULATORS at NSG

Calculators are an everyday tool which all pupils need to be able to use accurately and sensibly.

Calculators come in two types:

1. **basic** calculators which use arithmetic logic. This means calculations are carried out in the order they are entered 2 + 3 x 4 will give an answer of 20.
2. **scientific** calculators use algebraic logic following the mathematical order of operations so 2 + 3 x 4 will give the answer 14 since in algebra x takes precedent over addition.

Pupils need to be able to use both kinds of calculators but would normally be expected to use a scientific calculator in school. A number of phone applications are initially basic calculators unless scientific applications have been bought or can be accessed.

At Newland School we encourage all pupils to own a calculator

All Teaching Staff

All teachers should ensure that:

- pupils are made to consider the most appropriate method: mental, pencil and paper or calculator
- pupils are encouraged to use mental strategies in calculations, wherever possible
- pupils know when it is appropriate to use a calculator or calculating device (such as those available in ICT applications)
- pupils are questioned as to the technical skills required to use a calculator effectively (the order in which to use keys, how to enter numbers as money, measures, fractions etc.)
- pupils are asked if their answer is reasonable
- where appropriate pupils work is marked in accordance with the departmental policy but this marking highlights the need for the pupils to rethink either the calculation they have chosen or the way they have chosen to represent the calculation in explaining their reasoning

INTERVENTION STRATEGIES

Newland School for Girls makes the following provision for pupils identified as having poor numeracy skills based on end of Key Stage 2 results and school assessment. The criteria used to identify target groups are:

- below level 4 at the end of KS2
- SEND pupils
- underachieving EAL pupils
- children with interrupted education e.g. refugees, travellers etc.

Catch up strategies for targeted pupils:

- Regular timetabled sessions using the Individualised Learning System software Mymaths, using the maths concepts and skills package to help improve pupils' basic skills in numeracy
- Small group focus by a teaching assistant or support staff for extra tuition on basic skills in numeracy akin to corrective spelling and reading recovery programmes
- Regular support from SEN staff and mathematics department support staff at lunchtimes
- Identified numeracy lesson, once a week, for year 7 and once fortnightly for year 8
- Funded Summer Numeracy School. A summer scheme programme

Mathematics Department

The department will ensure that all staff are informed as to various aspects of numeracy and how these should be addressed. Training has already begun and staff are aware of the numerous strategies pupils will use in order to arrive at answers to basic and more complex calculations.

The department will review the returns from departments indicating how, where and when they are delivering aspects of numeracy and incorporate these into the curriculum structure (see the REAL Curriculum). Where there are strong links such as in Technology, Science and Geography aspects of numeracy will be strengthened through close co-operation with these departments with training across departments and in both directions particularly where specific software is being used.

The department will ensure that tutors are issued with numeracy tasks periodically which will be used in tutor times in order to stimulate thinking about numeracy outside the mathematics classroom and in order that pupils receive consistent messages from all staff across the school.

Success Criteria

It is hoped, with this policy and the consistent approach of staff applying the policy, that pupils' standards can be improved.

The success of the policy therefore should be evident in observations made as part of Appraisal, through learning walks, direct links between mathematics staff with other departments and standards in mathematics.

Process of implementation:

Departmental and SLT review and respond – April 2013
Shared with Middle Leaders May 2013
Introduced to Governors by Summer 2013
Policy review - March 2015

Cross-Curricular Audit Summary

Subject	Aspects of Numeracy	How?	When?	Expectations
Geography	Interpreting Data Large Numbers	Within different topics- not really taught on their own	Year 7 map skills	No expectations – very varied Don't know what is expected in year 7 maths Depends on what they have done at primary school.
Science	Interpreting Data Reading Scales Decimal Calculations			Surprises – how little they dan do / never seen it before
Technology/Art	Measurement/Use of scales(scale drawing) Models 3D and 2D Solid geometry	We use isometric grids and pupils draw a range of solid shapes they are asked to determine sizes for a games console We use 2D and 3D CAD to generate scale models Pupil model parts/ components then assemble these. This will only be successful if the sizes have been considered and correct	In year 7 during the CAD unit of work (first term)	We would expect they know the names of a wide range of 2D and 3D shapes. In order to use 3D CAD they need to understand what is radius, perimeter, face circumference etc. We would look at how shapes can revolve and [reflect] or extrude – basic engineering features. We sometimes use pi to work out the best size drill for a hole.
ICT/Business Studies	Using formulas in Spreadsheets Mental calculations (large numbers)	Taught in the finance unit on Break Even Analysis, cash flow forecasts, profit and loss statements	Usually delivered in year 11	Girls to be competent in the use of excel – they are but do struggle to turn data into graphs.

Subject	Aspects of Numeracy	How?	When?	Expectations
Modern Foreign Languages	Time The calendar/Dates	Introduce numbers in MFL Introduce o'clock inc. half past, quarter-past, quarter-to Introduce 24 hour clock Birthdays – using numbers and months	Dates and numbers in first term of each language in year 7 Time not introduced until year 8	Cannot tell the time in English Lack of understanding of minutes in hours
CPA	Timings Shape and Space Symmetry, estimation, pace and tempo	Dance music timings Pace and Tempi in editing/creating music for performance Shape and space - dance Character within a drama Estimation – duration of performance and rehearsals	All areas are taught on a continuous basis	Year 7 are made aware from the outset in CPA of where functional skills are built into the SOW and how they are expected to use these skills within each lesson.