



## **St Illtyd's Catholic High School Numeracy Policy**

### **Mission Statement:**

*St. Illtyd's Catholic High School 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 the skills necessary to empower them to deal with the demands of further education, employment and adult life.*

### **Introduction:**

#### **The purposes of our whole-school numeracy policy:**

- To develop, maintain and improve standards in numeracy across the school;
- To ensure consistency of practice including methods, vocabulary, notation, etc.;
- To indicate areas for collaboration between subjects;
- To assist the transfer of pupils' knowledge, skills and understanding between subjects.

#### **The development of the concept of "numeracy":**

1959 – (Crowther report) - Numeracy is defined as a word to represent the mirror image of literacy.

1982 – (Cockcroft report) - A numerate pupil is one who has the ability to cope confidently with the mathematical needs of adult life. There was an emphasis on the wider aspects of numeracy and not purely the skills of computation.

1995 (OED) – numerate means acquainted with the basic principles of Mathematics

#### **Definition of Numeracy**

"...an 'at-homeness' with numbers and an ability to cope with the mathematical demands of everyday life... An ability to have some appreciation and understanding of information which is presented in mathematical terms, for instance, graphs, charts or tables or by reference to percentage increase or decrease."

(Cockcroft Report, 1982)

"Numeracy is a proficiency which involves confidence and competence with numbers and measures. It requires an understanding of the number system, a repertoire of computational skills and an inclination and ability to solve number problems in a variety of contexts. Numeracy also demands practical understanding of the ways in

which information is gathered by counting and measuring, and is presented in graphs, diagrams, charts and tables”  
(National Framework for teaching Mathematics, DfES 1999)

## **Rationale & Equal opportunities**

Numeracy is an outcome of programs of study and is therefore a right for all pupils, not a privilege for some. At St. Iltyd’s Catholic High School, we believe that pupils have entitlement to a numeracy rich learning environment in school, regardless of perceived ability and that pupils’ self-confidence and beliefs in both themselves and mathematics need to be high if success is to be maximised.

## **Aims and Objectives**

Numeracy should be promoted throughout all areas of the curriculum in a consistent and efficient manner. Also it should be noted that learning, teaching and assessment of numeracy should be appropriate to pupils’ needs.

- To developing mental strategies as well as pencil and paper methods;
- To develop a confidence and competence in using and applying mathematics, recognising that skills are transferable across different subject areas and in a variety of contexts;
- To understand and use the correct mathematical language;
- To promote enjoyment and enthusiasm for learning through practical activities, exploration and discussion;
- To promote confidence and competence with numbers and number systems and so raise standards;
- To develop the ability to solve problems through decision making and reasoning in a range on contexts;
- To develop a practical understanding of the ways information is gathered and presented;
- To understand the importance of mathematics and numeracy in everyday life.

## **Raising Standards**

Raising Standards in numeracy across our school cannot be solely judged in increased test percentages. There is a need to evaluate the pupils’ ability to transfer mathematical skills into other subject areas, applying techniques to problem solving. Their confidence in attempting this is initially as important as achieving the correct solution. Pupil interviews and work sampling will be the main processes for evaluating the success of our practice.

## **Consistency of Practice**

The Mathematical Association recommend that teachers of Mathematics and teachers of other subjects co-operate on agreed strategies. In particular that:

### **Teachers of mathematics should:**

1. Be aware of the mathematical techniques used in other subjects and provide assistance and advice to other departments, so that a correct and consistent approach is used in all subjects.

2. Provide information to other subject teachers on appropriate expectations of students and difficulties likely to be experienced in various age and ability groups.
3. Through liaison with other teachers, attempt to ensure that students have appropriate numeracy skills by the time they are needed for work in other subject areas.
4. Seek opportunities to use topics and examination questions from other subjects in mathematics lessons.

### **Teachers of subjects other than mathematics should:**

1. Ensure that they are familiar with correct mathematical language, notation, conventions and techniques, relating to their own subject, and encourage students to use these correctly.
2. Be aware of appropriate expectations of students and difficulties that might be experienced with numeracy skills.
3. Provide information for mathematics teachers on the stage at which specific numeracy skills will be required for particular groups.
4. Ensure schemes of work have opportunities to embed numeracy wherever possible, and teachers promote the use of numeracy seeing it as an essential life skill.

### **The Role of the Numeracy Co-ordinator**

The role of the numeracy coordinator is:

- To development of numeracy throughout the school;
- To play a leading role in the design and production of a whole school policy for numeracy;
- To carry out an audit of the numeracy requirements/provision in all areas of study;
- To help identify training needs of staff in relation to numeracy and ensure that these training needs are met;
- To liaise with all subject departments to ensure that numeracy is developed in a coherent and consistent manner throughout the school;
- To establish procedures to monitor and evaluate the numeracy provision for all pupils in the school;
- To establish procedures to monitor and review the implementation of the school's numeracy policy;
- To ensure all staff are aware of their responsibility that the acquisition of basic skills is a whole school issue, and not subject based.

## **The Role of Parents**

Parents can actively assist the development of their child's mathematics through activities such as singing and chanting rhymes, reading stories and books containing mathematical ideas, playing games that have mathematical content, and modelling the use of mathematics in daily practical activities. A parental booklet will also be provided to support parents showing them how to carry out simple numerical problem with answers and tips.

The parents' role in their children's mathematical development is crucial, and will continue throughout their education. To do this effectively, parents should:

- Become informed about the nature of mathematics and numeracy;
- Talking to children about their mathematics, and discuss real life situations where numeracy skills are essential;
- Make their children aware when they as parents they are faced with mathematical demands in their everyday lives, and display a positive attitude when they face these demands;
- Building children's confidence and developing their interests in mathematics;
- Ask their children to explain their mathematical thinking when doing maths homework or performing everyday mathematical tasks;
- Being patient in regard to their child's development and discussing concerns with the teacher.

### **Helping with Numeracy at home:**

- Encourage your child to become involved in everyday problems and activities for example facts and figures for planning a meal or planning a shopping trip.
- Play games with your children and let them help you score.
- Praise and encourage your child as they come to grips with various mathematical situations. Give them the confidence to better organise and control their world through using mathematics.
- Children who are good at mathematics are prepared to "have a go" so encourage your children to find ways of doing things and talk to them about what they did, and why. This will help them see mistakes for what they are important early steps in working out how to get it right!

### **Transfer of Skills:**

*"It is vital that as the skills are taught, the applications are mentioned and as the applications are taught the skills are revisited."*

The transfer of skills is something that many pupils find difficult. It is essential to start from the basis that pupils realise it is the same skill that is being used; sometimes approaches in subjects differ so much that those basic connections are not made.

The maths department has tailored its schemes of work to ensure topics are covered before the forthcoming application in the other subject. This will help pupils to understand the transferable nature of numerous mathematical topics, and to start to appreciate the development of topics in a real life context. One particularly good

example of this is liaising with the Geography department to ensure pie charts and other data presentation methods are taught so that pupils have the ability to present the data they collect in that subject.

### **Monitoring and evaluating progress and provision**

All staff will be involved in the regular monitoring and evaluation of the implementation of the numeracy policy.

An audit of the use of numeracy within all subjects of the curriculum will be undertaken each term to determine the actual experiences gained by each pupil and evidence of pupils work will be provided to share as best practice. This will be completed by the numeracy coordinator.

### **Procedures to consider in the promotion of numeracy**

All teachers are considered to have a part to play in achieving a high standard of numeracy in the school and should recognise that numeracy is best promoted through purposeful teaching and enjoyable learning opportunities.

Teachers in all areas must be alert to opportunities that they can use deliberately to reinforce and augment their pupils' numeracy and to consider any opportunities for cross-curricular involvement. The purpose here is to try to lessen any complications or obstacles put in the pupils' way, which might lead to confusion or misunderstanding and hence hinder progress.

Teachers of mathematics are not solely responsible for development of numeracy across our school; it is a requirement of all teachers. Teachers in other areas of study therefore have a responsibility to help their pupils attain certain levels of numeracy. In this way all teachers contribute to their pupils' developing numeracy.

To help their pupils become more numerate, teachers should note the following,

- Number is central to numeracy in our society. It is commonly used in everyday life to calculate, count, order, measure, predict, describe, explain and justify. Pupils must continue to develop their competence with number throughout all their years of schooling;
- It is important to give pupils the chance to learn by investigating, exploring and conjecturing. Teachers will always need to intervene when the occasion demands it - for instance, when their pupils, either individually or as a group, need to acquire particular knowledge or skills within an acceptable period of time;
- All pupils must have a quick recall of number facts. This quick recall should be based on understanding and this quick recall and understanding will enhance the application of number in all areas of study;
- All pupils need to be given classroom opportunities to practise real-life applications of mathematics.

When the foundation for numeracy is well laid in the mathematics classroom, teachers in other areas will be better placed to build upon it hence close links will be established between the mathematics department and all other departments across the school. This will reinforce and add to what pupils have learned by getting them

to use their mathematical understanding in a variety of other contexts and situations, and as a result pupils become more numerate.

## **Numeracy across subject areas**

There are opportunities for drawing mathematical experience out of a wide range of children's activities. Mathematics contributes too many subjects of the curriculum, often in practical ways.

## **English**

English lessons can help to develop and support pupils' numeracy skills, for example, by use of mathematical vocabulary and technical terms, by asking children to read and interpret problems to identify the mathematical content, and by encouraging them to explain, argue and present their conclusions to others.

## **Science**

Almost every scientific investigation or experiment is likely to require one or more of the mathematical skills of classifying, counting, measuring, calculating, estimating, and recording in tables and graphs. In science pupils will, for example, order numbers, including decimals, calculate simple means and percentages, use negative numbers when taking temperatures, decide whether it is more appropriate to use a line graph or bar chart, and plot, interpret and predict from graphs.

## **Art and Design and Technology**

Measurements are often needed in Art and Technology. Many patterns and constructions are based on spatial ideas and properties of shapes, including symmetry. A lot of work is also undertaken using estimation of measurement and quantities. Designs may need enlarging or reducing, introducing ideas of multiplication and ratio. When dealing with recipes and cooking pupils will carry out a great deal of measurement calculations that include working out times and calculating cost.

## **ICT**

Children will apply and use mathematics in a variety of ways when they solve problems using ICT. For example, they will collect and classify data, enter it into data handling software, produce a variety of graphs and tables, and interpret and explain their results. Their work in animation and video making includes the measurement of time frames, converting units to pixels, and using ratio and scale to enlarge images. When they use computer models and simulations they will draw on their abilities to manipulate numbers and identify patterns and relationships.

## **History**

In History students will develop interpretation skills by analysing statistical data throughout key stage 3 and key stage 4. They will consider number lines and negative numbers in the study of chronology. Averages will also be studied along with percentage change in for the example the study of the Black Death, by analysing percentage of deaths and average age of death. Study will include the

ability to estimate and make sensible approximations when developing arguments and conclusions.

## **Geography**

In Geography students will collect, interpret and analyse data throughout key stage 3 and key stage 4 schemes of work. Students will make statistical enquires, for example in analysing population data to explore and compare lifestyles. Data will be processed and presented in a variety of ways, such as line graphs, bar charts, pie charts and scatter graphs. They will use a wide range of measurements, including converting units and considering ratio and scale, co-ordinates, angles, position and direction in the study of maps. Finally they will also consider percentages and rates of change.

## **Physical Education and Music**

Athletic activities require measurement of height, distance and time, while ideas of counting, time, symmetry, movement, position and direction are used extensively in music, dance, gymnastics and ball games.

## **Careers and PSE**

In these two areas numeracy can be directly related to everyday life. Budgeting, paying bills, running a home and other money management issues can be undertaken.

## **Business Studies**

Within this subject there is wide scope for numeracy in relation to real life situations. Also there is scope for handling data with meaningful figures. This can augment work carried out in other departments. Students as required to understand financial records and documents within any type of business, including the analysis and composition of balance sheets, profit and loss statements, breakeven data, and cash flow forecasts. Students develop various skills including budgeting, percentage increase or decrease and the use of algebraic formulas.

## **Modern Foreign Languages including Welsh**

There are various opportunities to embed numeracy within modern foreign languages. In both French and Spanish various number games and activities are used to develop number skills, including times tables games. Throughout key stage 3 and 4 students are encourage to conduct surveys and collect data considering peoples hobbies, where they live and favourite pets. Statistical data in then displayed in a variety of ways including bar charts, line graphs and pie charts. Analysis of statistical data is prevalent throughout the course. Currency and the use of conversion charts is an important skill developed by pupils, which in year 9 and key stage 4 is used to consider budgets for holidays, cost of shopping and percentage discounts. Finally within the healthy living scheme of work students are required to consider body mass index, plot a scatter graph of results, and draw conclusions from their findings.

The key to making the most of all these opportunities is to identify the mathematical possibilities across the curriculum at the planning stage. This will be achieved in each area of study by conducting an audit of what numeracy is required. Teachers of all subjects should make the links between subjects and numeracy explicit by talking about links frequently in their classes should also draw children's attention to the links between subjects by talking frequently about them, both in mathematics and in other lessons.

*This policy will be reviewed in June 2013*