Numeracy Policy

Key Document Details

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Our Mission Statement

St. Luke's Academy is committed to raising the standards of numeracy of all of our students, so that they develop the ability to use numeracy skills effectively in all areas of the curriculum and the skills necessary to cope confidently with the demands of further education, employment and adult life.

We as teachers see ourselves also as teachers of mathematics and numeracy regardless of the subject we teach. We feel our duty is to inspire young people to see the true beauty of mathematics in the wider world by bringing mathematics alive thereby making it exciting, relevant and easy.

The purposes of our whole-academy numeracy policy:

- to develop, maintain and improve standards of numeracy across the academy;
- to maintain or boost students' basic numeracy skills, incorporating multiplication table, time and money.
- Provide pupils with the confidence and key skills to do maths, ' I CAN do maths' rather than the general notion of I can't do maths.
- to assist the transfer of pupils' knowledge, skills and understanding between subjects.
- to ensure consistency of practice including methods, vocabulary, notation, etc.;
- to establish areas for collaboration between subjects;

Definition

Numeracy means many different things to different people. Some see numeracy as the foundation of mathematics, the concepts that you learn in school that are necessary for understanding more advanced mathematics. Some see numeracy purely as the ability to perform simple number calculations, and therefore as a subset of wider mathematics. However, at St. Luke's Academy we need to define it in terms of its purpose or its function, for example numeracy skills that are required for a job, in a practical sense and skills which are required in every day life.

The government define numeracy as: *'To be numerate means to be competent, confident, and comfortable with one's judgements on whether to use mathematics in a particular situation and if so, what mathematics to use, how to do it, what degree of accuracy is appropriate, and what the answer means in relation to the context.'*

Therefore as a result of this we have adapted our numeracy programme to support our learners by having key areas to focus on over every half term. There will be baseline and assessment questions provided at the start and end of each term which will highlight the progress made by the students in the specific topic. These will also be revisited during future terms to check recall.

Numeracy is a proficiency which is developed mainly in mathematics but also in other subjects. It is more than an ability to do basic arithmetic. It involves developing confidence and competence with numbers and measures. It requires understanding of the number system, a repertoire of mathematical techniques, and an inclination and ability to solve quantitative or spatial problems in a range of contexts. Numeracy also demands understanding of the ways in which data are gathered by counting and measuring, and presented in graphs, diagrams, charts and tables.

(Framework for Teaching Mathematics – yrs 7 to 9 – DfES)

At the heart of being a numerate learner

- Memorise number facts so that they can recall them without hesitation (fluency).
- Use known facts to work out new facts
- Use understanding of the relationship between the four rules of number to work out answers and check results
- Use a variety of mental strategies to work out calculations
- Solve problems involving calculation

Mathematics
Using & Applying, Numbers and the Number System, Calculation Algebra, Shape/Space/Measure, Handling Data

Numeracy
The application of mathematics to familiar and unfamiliar contexts (across the curriculum and to model real life situations)

Multiplication tables and confidence – Specific focus on multiplication tables using the online program to support their learning which will track progress and provide activities.

Understanding time (12/24hour, am:pm, minutes)

Conversions and measurements (weight, distance, length_ - progression onto area and perimeter working and calculating with measures.

Calculating and problem solving with money, using basic addition, subtraction, multiplication and division. (for example, receiving change from a given amount of money)

Fractions and percentages (calculating of amounts) percentage change, conversions can relate to ratio also (relating to money and shopping discounts)

Each topic will need to be complete during each term. Multiplication tables will need to be a part of each session underpinning the fundamentals and increasing pupils confidence. Use of online learning platforms such as MyMaths to be used as an extension of the numeracy topics where they will be used in problem solving questions and exemplar GCSE questions. Each tutor will be provided with Numeracy mats to support pupil learning and progress during the sessions.

Arithmetic
Arithmetic is more than the ability to calculate quickly and accurately – to add, subtract, multiply and divide, both mentally and using traditional written methods. It also develops an understanding about number, its structures and relationships, underpins progression from counting in nursery rhymes to calculating with and reasoning about numbers of all sizes, to working with measures, and establishing the foundations for algebraic thinking. This will be developed through the use of "99 Club" during Friday tutor time.

How do we develop numerate learners?

Teachers/ TAs of mathematics will:

- Promote a positive 'can do' attitude for mathematics to all students
- 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.
- Provide information to other subject teachers on appropriate age related expectations of students and difficulties likely to be experienced in various age and ability groups.
- Through liaison with other teachers, attempt to ensure that students have the appropriate mathematical skills by the time they are needed for work in other subject areas.
- Continue to strengthen the arithmetical skills of students ensuring they have the skills to calculate accurately and efficiently; building on the work started in the Primary phase and ensuring all stakeholders are aware of the academy's approach to calculation (see Appendix 2ii)
- Seek opportunities to use topics and applications from other subjects in mathematics lessons.

Teachers/TAs of subjects other than mathematics will:

- Promote mathematics in a positive way and avoid defaulting to a position where mathematics is described as 'hard', 'difficult to do' or "I'm no good at maths". "I CAN do maths".
- 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.
- Be aware of appropriate expectations of students and difficulties that might be experienced with numeracy skills.
- Be a teacher of mathematics - when teaching a lesson involving an aspect of mathematics, don't assume that the students can simply do the task – be prepared to teach them how to.
- Provide information for mathematics teachers on the stage at which specific mathematical skills will be required for particular groups.
- Identify opportunities and/or resources for mathematics teachers to integrate the application of mathematics in other subject areas into the mathematics lessons.

Appendix 1

Contextual Information

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 1999 – DfES Framework for Teaching Mathematics – Years 7 to 9

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- 2013 DfE The National Curriculum in England Framework document for consultation Numeracy and mathematics

  o 6.5 Teachers should develop pupils' numeracy in all subjects so that they understand and appreciate the importance of mathematics. Pupils should be taught to apply arithmetic fluently to problems, understand and use measures, estimate when using calculators and other technologies to produce results, and then interpret them appropriately. Pupils should apply their geometric and algebraic understanding, and relate their understanding of probability to the notions of risk and uncertainty. They should also understand the cyclical process of collecting, presenting and analysing data. They should be taught to apply their mathematics to both routine and non-routine problems, including breaking down more complex problems into a series of simpler steps.
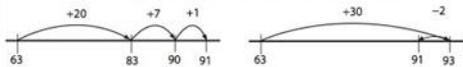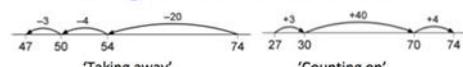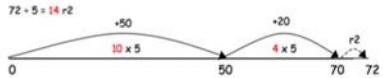
Collaboration

Mathematics levels:

It is essential for all teachers of all subjects to have an awareness of the current mathematical levels of the students that they teach. These are available on whole school data drops and pupils target grades in relation to their FFT5 target for Yr9, 10 & 11 and against core skills for Yr7 & 8. The mathematics department follows the national curriculum from Yr2 to 9 to show natural progression and a flight path when they get to year 10 and 11 to be able to access the GCSE content. Within each stage the department will follow the school assessment to track the pupils progress using the statements of 'Emerging, Developing, Securing' against set skills. Assessment of these statements will be ongoing through three weekly cycle assessments inline with the school policy. The results will be put into a spreadsheet and calculate the pupils' percentage progress and identify areas of development and understanding as well as providing SLT with raw data marks and percentages.

- Arithmetical Proficiency

  o Staff training should be provided on the variety of arithmetical techniques used by pupils in Key Stages 1, 2 and 3 – in their head, with jottings, using a written method or calculator.
  o Teachers should encourage students to articulate or show visually how they are doing a calculation.
  o All departments should give every encouragement to pupils using mental techniques but must also ensure that they are guided towards efficient methods and do not attempt convoluted mental techniques when a written or calculator method is required.
  o Staff training should be provided on key methods for written calculation, especially "non-standard" methods, for example for grid multiplication and division by chunking.

- o   Staff need to understand that there is a desire for pupils to progress to formal algorithms and the most efficient methods but not at the expense of having only a method rather than a cohesive and full understanding. Teachers should avoid implying there is a 'right' way to do a calculation and instead consider the alternatives and the efficiency of each method. Teachers need to provide alternative methods and from this allow pupils to identify a method which works for them and suits their different learning style.

- Role & Use of Calculators

  - o   The use of calculators should be considered carefully when planning an activity involving numeracy. In deciding when pupils use a calculator in lessons teacher should consider whether pupils should first select mental methods or pencil and paper methods. Pupils should also have the technical skills required to use a calculator, to say whether their answer is reasonable and interpret the calculator display in context (e.g. 5.3 is £5.30 in money calculations);
  - o   Schemes of work from across the curriculum should indicate when calculators are allowed, encouraged or prohibited within a task.
  - o   The use of calculators and understanding how they work is a vital skill in GCSE mathematics. Pupils need to be introduced to using calculators in KS3 to help with their confidence and understanding. This is highlighted with two of the three GCSE exam papers now being calculator papers.

- Vocabulary

  - o   The consistent use of vocabulary and terminology is key to being numerate.
  - o   A list of mathematical vocabulary is available to all staff entitled 'Numeracy Vocabulary List with Definitions'
  - o   Recommended practice:
    - ▪   display key mathematical words in every classroom (especially 4 operations, fractions, charts/data)
    - ▪   when explaining, make use of a variety of words that have the same meaning e.g. add/plus/sum/total
    - ▪   upgrade (and get students to upgrade their) terminology e.g. encourage 'multiply' instead of 'times'
    - ▪   actively and openly discuss words that have different mathematical meanings to those in everyday life e.g. similar, product, volume, translation, sum
    - ▪   actively and openly discuss equivalent terminology from mathematics and other subjects e.g. line of best fit in Science, weight vs mass, surface area
    - ▪   highlight root words or prefixes and suffixes to support decoding e.g. quadrilateral – quad means 4 and lateral means side.

Appendix 3

Transfer of Skills

The Mathematics team will deliver the knowledge, skills and understanding of mathematics. They will make references to the applications of mathematics in other subject areas and give contexts to many topics.

Other curriculum teams will build on this knowledge and help pupils to apply them in a variety of situations. Liaison between curriculum areas is vital to pupils being confident with this transfer of skills and the Mathematics team willingly offers support to achieve this through the 'Numeracy Buddy' scheme. For example, in science the use of formulas and measurement e.g. standard form.

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.

Appendix 4

To raise the numeracy levels of students arriving with low starting points and to develop the culture of numeracy as a critical skill across the Academy the following strategies are in use:

- Weekly Tutor-time Numeracy Challenges (as a competition) 99 Club, targeted intervention and work books and functional skills

- Tutor-time booster sessions – 99 Club focus on multiplication practice.

- Numeracy Theme days e.g. World Maths Day, NSPCC Number Day, National Pi Day (14th March), Challenge Days etc.

- Targeted interventions using resources and homework books from pearsons schools and colleges to support pupils target FFT5 grades. Online learning and work supported by the online learning platform of MyMaths.