

# Viking Academy Trust



## Mathematics Policy Ramsgate Arts Primary School

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Signed:



Chair of Trustees

# MATHEMATICS POLICY

## The Viking Academy Trust

Schools in the Viking Academy Trust (VAT)

Chilton Primary School

Ramsgate Arts Primary School

Upton Junior School

*This 'Mathematics' policy is specifically for Ramsgate Arts Primary School*

*"Mathematics provides a way of viewing and making sense of the world. It is used to analyse and communicate information and ideas, and to tackle a range of practical tasks and real-life problems.*

*Mathematics also provides the material and means of creating new imaginative worlds to explore. Through exploration within mathematics itself, new mathematics is created and current ideas are modified."*

Being numerate is a vital life skill and at Ramsgate Arts Primary School we are committed to giving all pupils the opportunities to develop the knowledge, skills and understanding of mathematics necessary to function in their life outside school.

### School Aims and Objectives

At Ramsgate Arts Primary School we aim to:

- Provide children with the mathematical skills necessary for life and an awareness of the uses of mathematics in the world outside the classroom;
- Provide a foundation of mathematical knowledge, skills and understanding;
- Encourage the development of a confident, independent and positive attitude towards mathematics;
- Develop an awareness of the power of mathematics when communicating and explaining;
- Meet the requirements of the National Curriculum.

In order to achieve our aims we have set out the following objectives. During their time in our school, children should:

- Learn maths facts, e.g. number bonds, names of and properties of shapes, etc;
- Develop their knowledge and rapid recall of all multiplication tables, including related division facts.
- Become confident in their use of all four operations including being able to select efficient methods (mental, written and calculator) when calculating
- Develop their practical skills, e.g. using calculators, measuring equipment, etc.
- Learn mathematical strategies, processes and methods
- Work systematically when problem-solving
- Become active mathematicians, both individually and as part of a group, able to apply knowledge to new concepts, investigate mathematical statements, and identify suitable operations and methods to solve word-based problems and explain their reasoning
- Be able to communicate methods and reasoning in a variety of contexts

### **The Teaching of Mathematics**

Maths is a proficiency that 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. Maths 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. The approach to teaching recommended by the new National Curriculum for Mathematics is based on three key principles:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

Pupils at Ramsgate Arts Primary School are taught mathematics in mixed-ability classes in the infant and junior years.

Each class teacher, with the exception of those working in the Foundation Stage (and at the start of Year 1), is expected to provide a daily lesson for mathematics, which should last for at least an hour. Typical lessons should include:

- A mental/oral warm up or starter activity; this includes arithmetic and recall of number bonds and times tables as well as opportunities to reason and develop number sense.
- A focus question; a short problem solving task carefully designed to anchor the children into the lesson. This part of the lesson is child-led and includes a lot of group and partner discussion.
- A teaching input; this part of the lesson reflects on the focus question and draws out the individual learning objective through class discussion and teaching.
- Partner work; time for children to consolidate their learning through partner work before attempting an independent challenge.
- A main task; a chance for pupils to independently demonstrate and practise the skills they are learning within the lesson. This part of the lesson should include a variety of tasks in order to encourage the children to apply their knowledge within different contexts. Challenge tasks will be available within all lessons and their purpose is to focus on allowing the children to solve problems using the skills they have been learning within the lesson.
- Plenary; a time to reflect and consolidate the learning within the lesson.
- Mini-plenaries throughout the lesson which may involve work with the whole class to refer back to the learning objective and success criteria, address misconceptions, identify progress, summarise key facts and ideas, clarify what needs to be remembered, to make links in other work and discuss next steps in learning.

### **Teaching strategies**

In order to provide the children with active and stimulating learning experiences, a variety of teaching and learning opportunities are adopted:-

- Children may work individually on a task, in pairs or in a small group, depending on the nature of the activity.
- Wherever possible, practical 'real' links are made within the lesson to introduce concepts and reinforce learning objectives.
- Specific mental skills and strategies are taught and children are given the chance to calculate mentally.
- Opportunities to transfer skills learnt to real situations are used whenever possible.
- Activities are carefully planned to encourage 100% active participation of all pupils throughout the lesson.

- Activities are differentiated to ensure all children are able to access the learning objective.
- Self-differentiation or 'challenge by choice' is used regularly in order for children to develop independence and challenge themselves.
- Teachers place a strong emphasis on correct use of mathematical language; this is supported by key vocabulary being displayed in every classroom.
- All year groups use hands-on manipulatives and children are encouraged to access these independently when appropriate.
- Oral contributions are valued and celebrated, creating a culture of discussion and collaborative exploration of mathematics.
- Multi-media is used to excite and inspire children to learn mathematics. This includes use of problem solving videos, times tables songs and mathematical web-games.
- Working wall display boards are used to encourage children to learn and recall important mathematical facts relevant to the current unit of work they are studying.
- Reasoning and problem solving skills are regularly taught explicitly by teachers as part of maths lessons in order to model the importance of systematic thinking, logical inference and written reasoning.

### **Teaching methods and approaches**

In order to provide the children with active and stimulating learning experiences, a variety of teaching and learning opportunities are adopted:-

- All teachers adopt a fluid Concrete, Pictorial, Abstract (CPA) route to teaching mathematics, meaning that children have access to concrete and pictorial representations of the mathematical concept they are learning alongside the formal abstract representation.
- A calculation pathway has been agreed. The mental and written methods taught are exemplified in the 'Calculation Policy'
- The Singapore Bar Model will be taught to and used by children in appropriate situations in order to assist the process of solving word problems. The Singapore Bar Model is further used within the exploration of Fractions, Decimals and Percentages (FDP) as a unified and consistent representation.
- A variation model of teaching ensures all units of work are planned to include multiple representations of the same concept in order to allow children to develop a rich understanding of a concept before moving on.

### **Long term planning**

Teachers will use the school's long term planning which is adapted from the *Primary Advantage Maths Programme - A model of best practice* (2015) which

organises the National Curriculum aims into a coherent sequence of lessons that builds learning up over time.

### **Medium term planning**

Teachers will use the *Primary Advantage Maths Programme - A model of best practice* (2015) which organises the National Curriculum aims into a coherent sequence of lessons that builds learning up over time. The emphasis is on supporting teachers with visualising mathematical concepts, enhancing curriculum and pedagogical knowledge and encouraging the use of key mathematical vocabulary specific to each strand of mathematics. Medium term planning framework grants liberty to teachers but provides a strong scaffold to support them when planning units of work.

### **Curriculum Planning**

#### **Short term planning**

Teachers have access to *Maths - No Problem!* resources to inspire and influence their daily lesson plans. Lessons must follow the structure outlined previously in this document and planning is monitored by the Senior Leadership Team and the Maths Lead. Teachers are encouraged to evaluate their lessons daily and make notes on pupils who have exceeded or not achieved expectations.

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### **Assessment**

The assessment of pupils learning aims to:

- inform teachers of pupils' progress in relation to a learning objective;
- enable teacher to plan lessons which suit the ability and age range of pupils;
- ensure progression of pupil learning;
- inform other parties of pupil progress, e.g. Head of School, parents, etc.

Teachers use the following assessment methods:

**Daily Informal Assessments** of pupil progress in relation to the learning objective through interaction with pupils during direct teaching, activities, plenary sessions, marking of work, and teaching assistant feedback. These assessments are recorded as lesson evaluations on each teacher's copy of their maths weekly plan (or Smartboard pages) and may feed in to other assessments. Daily assessments are used primarily to make adjustment to subsequent lessons where further input is required to achieve the learning objective or pupils can be moved on.

**Assessment Grids** (designed by the Compass Partnership) will be updated on an ongoing basis for each pupil in a class by the class teacher(s). There should be 3 examples of evidence across three samples before a statement is highlighted. The framework works on a 'best fit' model. To achieve 'Expected' within the year group approximately two thirds of the statements must be highlighted. A child will be awarded 'Emerging', 'Expected' or 'Exceeding' within a year group although they may be 'Emerging', 'Expected' or 'Exceeding' within a year group different from their chronological age (e.g. you could have a Year 3 child working on Year 1 objectives or a Year 2 child working on Year 4 objectives). These judgments will then be translated into 'points' and therefore attainment and achievement can be tracked (using the John Sinnott tracking system). Time will be set aside in INSET throughout the year for staff to moderate the points/judgement awarded for pupils. **Statutory SATS**

are used in Year 2 and Year 6. Analysis of results is performed by each teacher in order to track pupil progress and to identify strengths and weaknesses of the class and is used to inform planning. Gap Analysis and pupil progress is discussed at Pupil Progress Meetings with Senior Leadership Team. Pupils who are underachieving or not on track to meet targets will, where possible, be targeted through focus Wave 1 teaching or Wave 2 or 3 intervention groups. Findings may also be used by the Senior Leadership Team and Maths Leader to identify weaknesses common to all year groups

and set targets that aim to improve pupil performance in these areas through focused programmes and teacher inset.

### **Home Learning**

Home Learning challenges or activities are set out in Weekly blogs to parents. Love to Learn activities will have a Maths focus . Years 3-6 may be set a ' Mathletics ' home learning challenge which is on the website which can be accessed at home. Pupils have the opportunity to complete the activity after school with a teaching assistant. All pupils are expected to practise a number fact theme on a daily basis at home e.g. number bonds or times tables.

### **Liaison with Parents**

Parents are regularly informed of pupil progress through the sharing of assessment outcomes, parents' evenings and formal reports. These aim to celebrate pupils' successes and highlight areas where pupils could improve. For pupils in Years 2 and 6 the end of year report includes pupils' results in the SATs. Teachers will inform parents of any programmes/support that pupils are receiving and encourage them to support pupils in their learning.

### **Additional Support Programmes**

The school aims to ensure that pupils have the opportunity to maximise their achievement through funded support programmes,

### **Equal Opportunities and Special Educational Needs**

There is an Equal Opportunities policy which is applied to Mathematics. Teaching materials are chosen to reflect the cultural and ethnic diversity of our society. We avoid stereotyping by gender or race. Pupils' performance is monitored to ensure that no group of pupils is disadvantaged.

In lessons, the full participation of both girls and boys is encouraged and care is taken to ensure the emphasis on whole class teaching does not disadvantage any gender or racial group.

Care is taken to ensure that stereotypes are challenged through positive promotion, e.g. by ensuring that both boys and girls are given equal opportunities to demonstrate their understanding and achievements.

Pupils should be enabled to demonstrate their ability in mathematics. This is achieved through:



- targeted support for pupils with additional educational needs;
- differentiated activities planned to meet pupil's educational needs;
- self-differentiation in some lessons to enable children the choice of which level they would like to work at;
- teaching strategies and techniques to match pupils preferred learning style where appropriate;
- assessment techniques which enable all pupils to demonstrate their level of mathematical understanding.

All pupils should have the opportunity to work independently during each school week. To best meet the needs of pupils, however, some children may undertake tasks targeting their needs outside of the classroom. This may happen in the Mental & Oral Starter or during pupil activity times. All pupils should be present for any direct teaching and the plenary.

Pupils with Additional Educational Needs in maths may be given targets on their Provision Map.

### **Cross Curricular Links**

It is important that pupils see that mathematics is a life skill and not an abstract subject.

Pupils should also be provided with additional opportunities, outside the daily maths lesson to consolidate their skills and apply them. Therefore teachers should identify areas across the curriculum where pupils' mathematical knowledge and skills can be applied at the planning stage, e.g., statistical analysis/time/measurement in Athletics and History, co-ordinates in Geography, graphs and tables in I.T. and budgeting in Design and Technology. Pupil's attention should be drawn to the application of mathematics in other subjects by discussion and identifying the mathematical learning objective being applied.

### **Resources**

Essential teaching resources are allocated to each classroom. Further resources to support the teaching of maths are held in a central resource area. Each class is provided with a range of resources to promote effective teaching and ensure availability. The Maths Leader carries out regular inventories of resources and, where possible, buys in new resources in response to teachers' needs. Teachers are also kept informed on online/website resources and encouraged to give feedback on their usefulness. It is imperative that resources are used throughout the school in Maths lessons.

### **Health and Safety**

In line with the school's Health and Safety policy, children are instructed in the safe use of all equipment. For example, extra care is taken when children are using heavy weights with balances on the floor or using small apparatus, e.g. counting objects. Children working outside of the classroom will work in pairs or groups, monitored by a member of staff.

### **The Role of the Subject Leader / Maths Team**

**The subject leader will:**

- To monitor the mathematics and calculations policies and oversee their implementation.
- To monitor and advise colleagues on the quality of their teaching and the children's learning.
- To attend relevant courses to ensure developments in ongoing knowledge and understanding.
- To research and implement pedagogies that will improve the standards of teaching and learning mathematics.
- To monitor mathematics throughout the school: lesson observations, book scrutinies and learning walks.
- To organise and run extra-curricular activities, including competitions and clubs for all children.
- To promote the subject of maths around the school, encouraging a positive outlook towards learning.
- To update and review the schools Maths Improvement Plan in accordance with the School's Improvement Plan.

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