**The Hills Academy**

# Maths (including calculation)

*Updated: October 2019*
*Scheduled Review Date: September 2022*

*M. Parker*
*Maths Coordinator*

# POLICY

## Table of Contents

## 1. Details of staff training and training provider

| | | | |
|---|---|---|---|
| **3rd January 2017** | **1 day** | **Maths – calculation and age related expectations in Y5/6 inc. geometry and fractions** | **All teaching staff and TAs** |
| 2018-19 | 1 hour | Training on new calculation policy (MP) | All teaching staff |
| 2017-18 | 1 hour | Training on different types of problem solving activities (MP) | All teaching staff |
| 18 September 2019 | 1 hour | Arithmetic skills in multiplication and division (MP) | All teaching staff |
| 13th September 2019 | 1 hour | CPD on the importance of times tables recall and consistent delivery of times tables and counting stick starters each week across Years 1-6 (MP) | All teaching staff |
| 13th September 2019 | 1 hour | CPD based on maths key targets – key targets were established based on analysis of Year 6 SATs paper from the previous 3 years (MP) | All teaching staff |
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## 2. Philosophy

"Mathematics is not just a collection of skills; it is a way of thinking. It lies at the core of scientific understanding, and of rational and logical argument." Dr Colin Sparrow, Lecturer in Mathematics, University of Cambridge.
Mathematics equips pupils with a uniquely powerful set of tools to understand the world around them including logical reasoning, the skills to solve problems and the ability to think abstractly. It provides a precise means of communication using numbers, symbols and shapes. It transcends cultural boundaries and is a universal language that is used to explain, predict and represent events and tackle problems in everyday life.

We believe in labelling the activity and not the child at The Hills Academy. Differentiation within lessons should be evident and obvious; however, a child should not be trained to think that I sit on a certain table so I should always complete the task assigned to that table and not progress any further. Class teachers should not have names for their tables – they should have names for their activities. Children should be encouraged to progress through levels of differentiation within lessons and, depending on assessment carried out by the class teacher, should not always begin a lesson on the same level of differentiated task. A child who may be below age-related expectations at some point in their primary schooling should not be expected to remain there. A child who is working at age-related expectations at some point in their primary schooling should be challenged to reach a greater depth of understanding by the time that they finish.

## 3. Aims

We aim to:

- provide children with a thorough knowledge and understanding of number, calculations, shape, space, measure and data as outlined in the 2014 Primary National Curriculum

- provide all children with the necessary practical and creative skills to be able to apply their understanding to mathematical problems and real life situations
- encourage each child to develop their mathematical knowledge and understanding through systematic direct teaching of appropriate learning objectives
- provide daily maths lessons of 45-60 minutes which feature oral and mental work and direct teaching to the class that is lively, interactive and stimulating
- provide all children with an opportunity to consolidate their understanding of key targets (see key target Years 1-6) through providing children with a daily calculation/problem of the day every morning during registration time
- help children to observe patterns and relationships which are central to mathematics
- develop an ability in the children to express themselves fluently, to talk about the subject with assurance, using correct mathematical language and vocabulary
- promote enjoyment and enthusiasm for learning through practical activity, exploration and discussion.
- encourage a confident and positive attitude
- develop logical thinking and reasoning skills, curiosity, open-mindedness, enthusiasm and a willingness through a natural curiosity and investigative approach
- understand the importance of mathematical skills in everyday life.

## 4. Practice

**Learning and Teaching**

At The Hills Academy, we believe that a variety of learning and teaching styles, and classroom organisation, are necessary in order to maximise the significant contribution that maths makes to pupils' all-round development

(These are detailed in the Learning and Teaching Policy)

Mathematics is taught following the 2014 Primary National Curriculum age-related expectations. We aim to provide a daily maths lesson of 45 to 60 minutes. We do this through a daily lesson that has a high proportion of whole class and group-direct teaching. A variety of different teaching methods and styles are used, as appropriate, to meet the aims and objectives of the lesson and the age and ability of the pupils. These include:

- teacher explanation, demonstration or modelling
- whole class, grouped, paired or individual work
- problem solving and investigations
- first-hand experience
- use of real-life situations
- practical activities
- mental / oral work
- mathematical discussion
- use of ICT (Information and communications technology) including I pads, class computers and the computer suite or laptops, DVDs (Digital Versatile Disc) or CD ROMs (Compact Disc Read Only Memory), television programmes, interactive whiteboard
- mathematical games or puzzles
- practise and consolidation of skills
- talk partners
- appropriate and manageable homework activities

During these lessons, we encourage children to ask as well as answer mathematical questions. They have the opportunity to use a wide range of resources and apparatus to support their work. Children and teachers use ICT in mathematics lessons where it will enhance their learning and assist with modelling ideas and methods.

Wherever possible, we encourage the children to use and apply their learning in everyday situations.
In all classes, there are children of differing mathematical ability. We recognise this fact and provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. Throughout lessons, a range of strategies are used to ensure appropriate levelled learning. Children are asked to undertake independent work but other strategies are also utilized. In some lessons, group work is undertaken, and in other lessons, children are organised to work in pairs on open-ended problems or tasks.

We enjoy teaching mathematics to all children, whatever their ability. We provide learning opportunities that are matched to the needs of children with individual needs. We use individual needs assistants to support some children pupils who have specific areas to address in individual intervention slots. Additional teachers or group support sessions are organised to address the progress of specific groups of learners or to secure specific learning objectives.

## 5. Marking

We recognise the importance of responding to children's work, whether orally or in writing. We seek to encourage children by highlighting positive achievements. This should include rewards (in line with the school behaviour policy) for effort displayed and use of a viable method as well as correct and accurate answers. Children are given opportunities, and are actively encouraged, to explain their work to others and to display their work when appropriate. They are encouraged to value and respect the work of others. In Years 1-6, children receive in-depth marking once a fortnight in the form of a next step or a remember comment from their class teacher. The purpose of this marking is to develop a child's understanding of a key target if misconceptions are evident in their maths books. If they displayed a good level of understanding during a lesson, the purpose of this marking should be to progress children onto the next step in their learning (rather than attempting another similar question). Children are encouraged to respond to all in-depth marking as well as self-assessing with traffic lights how challenging they found their remember or next step comment. If children provide an incorrect answer to an in-depth mark, time should be taken by their class teacher to discuss the question with them and correct it together through discussion. Learning objectives and success criteria should be displayed in maths books for every lesson that is delivered. All individual success criteria should be ticked if a child met that objective during a lesson. If a child did not meet an objective during a lesson, the success criteria should be left blank. Either the learning objective should be ticked or MET should be written next to the learning objective on every page to identify whether a child has met that learning objective during that lesson. If a child has not met a learning objective, WT (working towards) should be recorded on the page. Worked is marked in blue in the school

handwriting script. Please see specific maths marking guidance for details on marking codes that should be used within maths books.

SPECIFIC MATHS MARKING GUIDANCE (FROM MARKING POLICY)

- Mark correct answers with a tick and incorrect answers with a dot.
- LO's should be ticked or 'MET' should be recorded onto every page to indicate whether a pupil has achieved the learning objective within that lesson. LO's should be left blank or 'WT' should be recorded onto the page to indicate that the pupil is working towards achieving that learning objective.
- Individual success criteria should be ticked or left blank to indicate which individual success criteria within that lesson has been achieved or not.
- Make specific written comments where applicable. It may sometimes be informative to comment on the time taken to complete work, additional support given must be noted.
- KS1 and 2 undertake a fortnightly piece of in-depth maths marking. This should take the form of a focused next step comment highlighted by a pink square underneath a piece of work with a teacher comment to move the learning on. The child should traffic light with a pencil crayon (red, orange, green) after they have read and acted upon the comment to indicate their level of confidence. Time will be made in KS2 and KS1 to allow for this. These comments should be in maths book so there is cumulative picture of teacher feedback to guide progress. Marking codes should be present when marking responses to in-depth marking to indicate level of support given (refer to maths marking codes).
- Please use marking abbreviations (described above) in the margin or near the section of work where support was given
- Ensure written comments are linked to the learning objective/success criteria of the lesson and help the pupil understand their next step.
- In years 1 & 2, verbal and written feedback during in-depth marking are combined. If children are developing their word reading skills, feedback is often through verbal comments with questions to encourage dialogue and check pupils' understanding. In years 1 and 2, feedback can be instructions/actions for other adults or teaching staff to follow and act upon. Teaching staff or other adults would discuss the child's next step with them and add the marking codes detailed above upon completion.
- As children progress through KS1, written feedback is shared with them to encourage understanding when in-depth marking has been undertaken. In-depth marking takes place once a week with alternate weeks for English or Maths.
- Follow the following guidelines for corrections-
  - Incorrect answers should not be rubbed out once marked
  - Corrections should be made near the original answer or at the bottom of the piece of work
  - A "c" should be written by the dot if answers are to be corrected
  - 'AS' or other marking codes should be recorded next to the corrections based on the level of support that has been provided
  - TD would indicate a quick intervention such as "What do you notice about … or "Can your answer…?" where attention has been drawn to an error but no adult support has been needed to rectify it.
  - "AS" would show adult support was needed to begin or complete a calculation, mistake or correction. Really accurate use of codes in specific areas on the page (i.e. above a particular jump on a number line) indicates if only one small area needed support.

## 6. Organisation and management

Mathematics is a core subject that is assessed during statutory assessments in Years 2 and 6. Mathematics is delivered every day (in the mornings when possible) and is evidenced in maths books. Throughout the year, a balance of 40-60% between written and practical tasks should be present in maths books in every year group. In addition, 3-5 types of problem solving activity should be present in books every term and every type of problem solving activity should be evident at least once throughout the year. Each year group has a teaching structure and overview of the learning objectives that they should deliver during each week of each term. Class teachers should ensure that they follow this overview when teaching learning objectives throughout the year. Class teachers should focus on breadth and depth of understanding and displaying different concepts in different ways using different representations. This will ensure that pupils have the opportunity to develop a secure understanding of each learning objective that is delivered and it will ensure that pupils are adequately prepared for statutory assessments that are administered during Years 2 and 6. During the weeks where no learning objectives have been provided on the learning objective overview, teaching staff should agree, during their planning meeting, which of the key targets attached to their year group they need to re-deliver and consolidate.

One week each half term will be an assessment week. During this week, all teaching staff must administer and mark the termly progress checks to every child in their year group. Teachers should ensure that any child who was absent during the administration of the termly check sits the paper when they return to school: the maths coordinator uses the data from the termly checks to monitor and track the progress and attainment of all cohorts within the school. Following the marking of the termly checks, class teachers fill in a feedback from that will be sent to the maths coordinator. These feedback forms will detail who didn't perform as expected on the termly checks, what steps will be put in place to support certain children during the following term, and how often and with who that support will take place. Maths planning does not need to be prepared for assessment weeks: two lessons should be used to administer the checks, three lessons should be used to discuss and address common areas of misconception for children (evidence of these lessons is not needed). This ensures that teacher workload during assessment weeks is not excessive and that required tasks (marking and uploading scores and feedback forms) are completed to a high standard. Completing these tasks to a high standard will ensure that effective steps to support each child are put in place for the following term.

Mathematical concepts should be taught through a concrete-pictorial-abstract approach (see calculation policy). Children should not progress onto abstract methods before they have first demonstrated an understanding of mathematical concepts through the use of concrete objects or pictorial representations. Every lesson that is planned or delivered should contain a brand new concept, new level of concept or a mastery activity (ideally a new level of concept and a mastery activity). This will ensure that progress and challenge is evident during every lesson for every child in every class. Every morning, children are provided with a calculation/problem of the day that is based around key targets attached to their year group. This provides all children with the opportunity to consolidate their understanding of key targets attached to their year group.

Teaching staff in the same year group should meet each week to discuss the maths planning as a team. This will ensure that maths is delivered consistently to every child in every year group. It will also provide teachers with an opportunity to discuss the weekly planning and improve or adapt the planning as necessary depending on their current cohort. TargetTracker objectives for maths should be updated once a fortnight by class teachers in every year group. Class teachers should agree which objectives are being updated during their planning meeting and should discuss some assessments together to ensure that assessments within each year group are being completed accurately and consistently. Whole-school maths book looks are carried by teaching staff every term to review whether evidence on Target Tracker matches evidence within maths books. Year group book looks are carried out by the maths coordinator and SLT every term to review whether teaching and planning expectations that have been communicated to teaching staff are evident within maths books. Next steps are established and agreed with teaching staff every term following year group book looks. These next steps are reviewed and monitored during that year group's book look the following term.

Management of the subject is the responsibility of the maths coordinator. However, the maths coordinator should liaise with members of SLT and should not make any decisions or changes to structure/organization/expectations before first agreeing with members of SLT that proposed changes are beneficial and manageable by teaching staff. Although the maths coordinator is responsible for the management of the subject, staff are strongly encouraged to suggest ideas and have an input on proposed changes to the subject: only by drawing on the expertise of every member of staff can real and significant improvements be made. Staff have the opportunity to share their ideas during staff meetings/training and during yearly staff voice surveys that are carried out by the maths coordinator.

## 7. Resources

We aim to provide a variety of different resources to support pupils and staff in the delivery of mathematics. These include:

- Learning objective overviews for each year group
- Resources for children to use within lessons (differentiated if necessary and adapted/changed depending on the learning objective)
- Termly assessment checks to support staff with their assessments of pupils
- Example of mastery activities to support staff in planning and teaching maths
- Adequate resources within the classroom that children require in order to display a high level of behaviour for learning i.e. sharp pencils, rubbers, pencil sharpeners, rulers etc.
- Counting sticks in every classroom to support in the delivery and learning of times tables
- Key targets for Years 1-6 to support staff in planning and teaching maths
- Planning and teaching expectations within one document to support staff in planning and teaching mathematics

Resources are located either in individual classrooms or stored centrally in the maths cupboard. Resources/apparatus that are regularly used within lessons should be easily

accessible to children and they should be encouraged to collect these resources themselves: teachers should be working with focused groups during lessons and should not be disturbed for children to gather the resources that they need. Resources/apparatus that are not regularly used (e.g. 3D shapes) should be stored centrally in the maths cupboard so all teaching staff have access to them when needed. Resources that are specific to certain year groups, that are not regularly used, can be stored neatly in cupboards within classrooms. It is the responsibility of all teaching staff to order or gather the resources that they need for teaching prior to the delivery of the lesson. Teachers within each year group must regularly update the resources that they require for teaching if needed. Resources that are used by teaching staff to support in the planning and teaching of maths are stored centrally inside the maths folder on staff common.

## 8. Assessment, recording and reporting

Assessment is both formal and informal. Informal assessments (see below) can be used to inform future planning and ensure that the needs of all children are met. Formal assessments (see below) form the legal requirement of a teacher's duties to assess children against age-related expectations and report this to parents. Examples of formal and informal assessments that are carried out at the school are outlined below:

**Informal assessment**

- assessment for learning strategies within lessons
- teacher observation
- teacher questioning
- marking of work
- pupil progress paperwork

**Formal assessment**

- completion of fortnightly updating of learning objectives on TargetTracker
- administration of statutory assessments in Years 2 and 6 and the multiplication check in Year 4
- administration of the termly progress checks in Years 1-6
- updating the tracking of age-related performance (1,2,3) sheet from Years 1-6
- pupil progress paperwork

Pupil's progress and current level of attainment is reported to parents every term in the form of a report that is written by the class teacher. Termly reports to parents informs them whether their child is working below age-related expectations, working within age-related expectations, securing age-related expectations, or is working above age-related expectations. The class teacher should also inform the parent each term, during parent consultations, how much progress their child has secured. Parents also have the opportunity to discuss with their child's class teacher how their child is attaining and progressing during parent consultations. If a parent wishes to discuss their child's progress or attainment prior to a parent consultation evening, they can arrange a meeting with their child's class teacher through the school office.

Following statutory assessments in Years 2 and 6, parents will receive their child's scaled score in maths and whether they are working towards (WTS) the expected standard of attainment, working at the expected standard (EXS), or if they have achieved a greater depth of understanding (GDS) of age-related attainment targets. Parents will also be provided with a comparison of how their child has performed on statutory assessments in comparison to other children at the school and nationally.

## 9. Inclusion

There is a commitment to inclusive practice. Inclusion is the responsibility of everyone in the school. The Equality Act 2010 provides an updated statutory framework to ensure that all people with protected characteristics are given equal opportunities. All children have the right to attend a mainstream school, unless their parents choose otherwise or if this is incompatible with 'efficient education for other children.' Alongside the act The Disability Equality Duty(DED), introduced into The Disability Discrimination Act in 2005, place new duties on schools not to treat disabled pupils less favourably than others and to make 'reasonable adjustments' to ensure that they are not disadvantaged. This may involve disabled pupils receiving more favourable provision.

Children's current level of attainment and individual needs should be considered when planning and teaching mathematics. Children, who are working below current age-related expectations, should not be expected to attempt to secure learning objectives attached to their current year group. It is every teacher's responsibility to ensure that they adapt their teaching and planning to cater for the needs of all pupils e.g. a Year 4 pupil, who has not secured Year 3 addition targets, should secure Year 3 targets before progressing onto Year 4 targets. All teaching staff should review TargetTracker and formal assessments of each child in their class to decide how to differentiate work appropriately. This will allow all pupils to engage with every lesson and attempt to complete work that has been appropriately differentiated for them.

## 10. Equal Opportunities

The Hills Academy is committed to working towards equality of opportunity of all children regardless of age, race and social circumstance. All children will be given equal access to all areas of the curriculum, and school life as a whole.

## 11. Monitoring and Evaluation

Procedures are in place and are detailed in the tri-annual timetable for monitoring and evaluation which is in the school handbook. Monitoring of the standards of children's work and of the quality teaching in mathematics follows the 3 yearly monitoring cycle of pupil voice survey, monitoring report and learning walk. The work of the mathematics subject leader also involves supporting colleagues in the teaching of mathematics, being informed about current developments in the subject, and providing a strategic lead and direction for the subject in the school. Governor visits to the school are warmly welcomed.

## 12. Homework

MyMaths is an interactive online teaching and homework subscription website for schools that builds pupil engagement and consolidates maths knowledge. It is the main system for setting maths homework at the school and homework is set for all pupils in Years 1-6 on MyMaths every Friday. The tasks set are based on learning objectives that have already been delivered in lessons; this ensures that children are able to engage with homework outside of school. Teachers can monitor the completion and accuracy of tasks completed and set alternative activities such as websites if the content does not match the work in class. Weekly times table practice is also set as weekly homework on each year groups' half termly homework sheets that are sent home at the beginning of each half term.

Additional fortnightly maths homework is also set for children in Years 5 and 6. These homework tasks are informed by key targets and are intended to prepare children for statutory assessments administered in Year 6. These fortnightly tasks are also set based on what has already been delivered in lessons. In addition to preparing children for statutory assessments, they aim to inform parents of the key targets that their child must secure in order to reach age-related expectations at the end of Year 6.

## 13. Times tables

See separate times table policy.

## 14. Calculation Policy Yr N-6

See separate calculation policy

# Amendments

| Amendment Details | Made By | Date |
|---|---|---|
| New year 5 and 6 calculation additions to calculation policy | Governors and Headteacher | Oct 16 |
| New calculation policy created by maths coordinator | M Parker (maths coordinator) | Sept '18 |
| New times table policy created | M Parker (maths coordinator) | Sept '19 |
| All areas, except sections 3 and 4, of the maths policy updated | M Parker (maths coordinator) | Sept '19 |
| Marking codes reviewed and agreed | M Parker (maths coordinator)<br>V Thomson | May '19 |
| Marking policy updated | M Parker (maths coordinator) | May '19 |
| Presentation guidelines reviewed | M Parker (maths coordinator) | Sept '19 |
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