Maths Plan

Introductory Statement and Rationale

(a) Introductory Statement

Cuireadh an plean seo le chéile i rith na scoilbliana 2013-14.

(b) Rationale

Mar fhoireann bhíomar ag iarraidh feabhas a chur ar ár gcleachtas scoile agus sinn ag díriú ar na pointí thíos luaite:

To benefit teaching and learning in our school

To conform to principles of learning outlined in the Primary School Curriculum

To review the existing plan for mathematics

Vision and Aims

(a) Vision

Our school cherishes all pupils equally and, to aid them in achieving their true potential we endeavour in Doolin NS to give each and every child every opportunity to do so. We encourage an inclusive approach to education where diversity is catered for within the school and class setting differentiation is used by the class teacher to foster inclusivity.

(b) Aims

We in Doolin NS strive to reach the aims of the Primary School Curriculum for mathematics

- *To develop a positive attitude towards mathematics and an appreciation of both its practical and its aesthetic aspects*

- *To develop problem-solving abilities and a facility for the application of mathematics to everyday life*
- *To enable the child to use mathematical language effectively and accurately*
- *To enable the child to acquire an understanding of mathematical concepts and processes to his/her appropriate level of development and ability*
- *To enable the child to acquire proficiency in fundamental mathematical skills and in recalling basic number facts*

This Mathematics plan will be addressed under the following headings:

Curriculum planning

1. Strands and strand units
2. Approaches and methodologies
3. Assessment and record keeping
4. Children with different needs
5. Equality of participation and access

Organisational planning

1. Timetable
2. Homework
3. Resources and ICT
4. Individual teachers' planning and reporting
5. Staff development
6. Parental involvement – home school links
7. Community links

1. Strands and strand units

(For content overview see Curriculum: Infants p.17; First & Second classes p. 37; Third & Fourth classes p.61; Fifth & Sixth classes p. 85)

- In order to ensure that all teachers are familiar with the curriculum for their class level, we will include the at a glance cards which outline all objectives in

our class planning folders. At a staff meeting teachers will get the opportunity to study , discuss and share ideas relating to the objectives

- In order to ensure that this familiarity is maintained if teachers change classes or if new teachers join the staff, we will meet regularly to discuss and share ideas relating to the objectives
- We will address specific issues relating to multi-class situations on a continuous basis. This will be done during our weekly afterschool meetings which are of a whole school and group nature. These group based meetings will give us ideal opportunities to discuss and enhance our multi-class/split-class approach.

2. Approaches and methodologies

In the mathematics curriculum the strands and strand units are viewed through the lens of the approaches and methodologies. (Teacher Guidelines: Mathematics pp. 30 – 67)

2.1 General

- All children should be provided with the opportunity to access the full range (all strands) of the mathematics curriculum. *It is important that teachers individual planning reflect the objectives as outlined in the curriculum and not follow a text and that there be consultation between class teachers and LS/ Resource teachers for those pupils who attend LS/Resource*
- We need to ensure that there is less emphasis and reliance on textbooks and workbooks and more on active learning strategies
- We ensure that the textbooks in use are in line with content objectives for the class level

- Appropriate use of concrete materials is encouraged in all classes. Teachers in the middle and senior classes are reminded of the importance of same.
- Opportunities are provided for all children from fourth to sixth class to use calculators, *e.g. to check answers, to explore the number system, to remove computational barriers for weaker children or to focus on problem solving*

- We ensure that the number limits are being adhered to, particularly at first and second classes where the emphasis is on the development of the concept of place value, *e.g. more work within the hundred square without going past 100 (Teacher Guidelines: Mathematics, p. 70)*

- We are in agreement that formulae are being 'discovered' by children rather than being taught by rote, *e.g. length by breadth (but we also see the need for learning rules by rote after discovery)*

- There is an emphasis on simple fraction families in the senior classes

- Pupils will be collecting real data in other areas of the curriculum and using it to represent their findings i.e. using data from other subjects such as geography, history or science to find the answer to a question, gathering data to answer their own questions such as 'Do more/less children walk to school this year than five years ago?' 'What are the three favourite vegetables eaten by children in our class?'

- Estimation skills will be developed and refined with the emphasis on using estimation in all areas of mathematics, *e.g. using estimation in measures, shape and space and not just in number?*

- We need consensus among the staff in relation to the use of estimation strategies in number? *(Teacher Guidelines: Mathematics pp. 32-34)*

- Estimation skills need to be refined and the 'guesses' or estimations should become more realistic and accurate?
- Profile of mathematics as a subject to be enjoyed by all children is encouraged in Scoil Mhuire gan Smál, *e.g. mathematics fun days, display of mathematics work in school, mathematics section in the library?*

2.2 Talk and discussion

Guided discussion and discussion skills

- Talk and discussion in mathematics is taken seriously and seen as an integral part of the learning process, *e.g. teacher/pupil, pupil/pupil, pupil/teacher?*
- Opportunities are provided for pupils to explain how they got the answer to a problem, discuss alternative ways of approaching a problem or give oral descriptions of group solutions?

Scaffolding

- The teacher actively models the language to be used, particularly when talking through the problem-solving process

Integration

- Areas in other subjects will be identified where mathematical processes are appropriate and useful, *e.g. gathering data in history and geography, measuring temperatures in science?*
- Opportunities where a thematic approach could be used across a number of subjects are identified *(Teacher Guidelines: Mathematics pp. 53 and 57 for examples)*

Linkage

- Opportunities where a thematic approach might be used for linkage are identified, *e.g. when dealing with decimals are we also aware of their use in data – pie charts; measures – all areas but particularly money for introducing decimals (See Teacher Guidelines: Mathematics pp. 52 & 56)*

Mathematical language in context

- **There is an agreed emphasis on the language of mathematics i.e. we do have a list of terminology, language appropriate for each class level (see attached)**

- There is a conscious effort made to use the children's own ideas and environment as a basis for reinforcing mathematical language, *e.g. you are taller than he is, teacher's table is longer/wider than yours*
- Teachers will identify common approaches to the language used in
    - Addition – total, sum of, add, and …
    - Subtraction – minus, subtraction, take-away, difference, less than …
    - Multiplication – times, product of, multiply, groups of …
    - Division – divide, share, split, groups of …
    - Equals – same as, is, will be, answer is, means …

Note: Although the whole-school plan may have identified particular terms to be used at different *class levels, care must be taken that children, during their school career, are exposed to the different terms used in relation to the symbols e.g. +, add, plus etc.*

Number facts

- There is a common approach to the teaching of number facts (tables), *e.g. for 3 X 4, do we say three fours, three groups of four, four threes, four groups of three?*
- Children are made aware of the commutative properties of multiplication tables and of their relationship with division
- We teach subtraction and division tables separately to addition and multiplication but we then lead the children to make the connection between them.

2.3 Active learning and guided discovery

- There are agreed strategies for teaching

  - Addition – top to bottom or bottom to top …
  - Subtraction – use of materials and decomposition (transition boards …)
  - Multiplication – vertical/horizontal presentation, skip counting, using mental strategies such as identifying doubles, near doubles, multiplying by 5 and 10, using games to reinforce facts, developing and honing estimation skills
  - Division – concept of sharing, understanding division as repeated subtraction, developing and honing estimation skills
  - How do we add and subtract fractions?
  - How do we add and subtract time?

State what the strategies are and for which class(es) they are most applicable. *For a selection of activities and strategies for the four operations see the PCSP website* www.pcsp.ie

- The children are encouraged to develop personal benchmarks, particularly in the measures strand, *e.g. noting their height in relation to a metre, the width of their finger as close to a centimetre, 4 carpet tiles covering a square metre (in some schools)*

- Mathematical games are in use at each level, *e.g. dice, cards, dominoes, spinner games, games devised by the children themselves – middle and senior levels? Are they being used to support particular areas of mathematics. Children are familiar with how to play them and clear about when they have access to them. They are clearly labelled showing how many pieces and for what age level etc.*

2.4 Collaborative and co-operative learning

- We take steps to ensure that children learn the skills needed to work *as* a group rather than just *in* a group, *e.g. listening to others, turn-taking, appreciating that others' opinions are important.*. These provide opportunities for children to learn from their peers, *e.g. buddy systems, older children 'teaching' younger ones?*
- Each class uses a variety of organisational styles, *e.g. pair work, group work and whole class work*

2.5 Problem-solving

- Children are encouraged to use their own ideas as a context for problem-solving, *e.g. my mammy bought a 2 litre bottle of orange for the party yesterday – was it cheaper than two 1 litre bottles?*

- There is agreement on using strategies such as RAVECCC* and ROSE* to support children's problem-solving strategies? It is not essential to choose only one but it is useful if teachers are aware of those in use, particularly those working with children with special needs.

*RAVECCC – Read, Attend to key words, Visualise, Estimate, Choose numbers, Calculate, Check

*ROSE – Read, Organise, Solve, Evaluate

(All of these are just variations and teachers can easily construct their own to suit their circumstances. Fuller explanations and examples, including a problem-solving bookmark, are available on the PCSP website www.pcsp.ie)

- In making problem-solving more accessible and realistic for children teachers use checkable answers or use a calculator for larger numbers as part of their programme
- We are providing opportunities for all children, Infants to Sixth class and including those with special needs, to have the opportunity to experience problem-solving activities, *e.g. by giving oral problems; by having them use objects to solve the problem; by using smaller numbers; by using items in the environment, e.g. how many beads can I hold in one hand – a little, a lot, more than teacher?*

2.6 Using the environment

- We are using the school environment to provide opportunities for mathematical problem-solving *e.g. putting numbers on doors; marking heights on dado rails or cupboards which can be used for comparison; having a puzzle of the week on the school notice board; having a mathematics facts board (Did you know?) to which children can contribute; using large dice in PE to pick teams; set number of laps to run; using hula hoops for sorting children in the PE hall?*
- Mathematical trails are being developed within or outside of the school building.
- We give children opportunities to present/display their mathematical work in the class/corridor/school.

2.7 Skills through content

- Teachers are making sure that skills are being actively developed through the content *(Teacher Guidelines: Mathematics pp. 68-69)* There is evidence to be seen that transfer of those skills is taking place in other areas
  - **Applying and problem solving,** *e.g. selecting appropriate materials and processes in science*
  - **Communicating and expressing,** *e.g. discussing and explaining the processes used to map an area in geography*
  - **Integrating and connecting,** *e.g. recognising mathematics in the environment*
  - **Reasoning,** *e.g. exploring and investigating patterns and relationships in music*
  - **Implementing,** *e.g. using mathematics as an everyday life skill*
  - **Understanding and recalling,** *e.g. understanding and recalling terminology, facts, definitions, and formulae*
- All classes encourage the use of mental mathematics? *(See PCSP website www.pcsp.ie)*

2.8 Presentation of work

- There is an agreed approach to numeral formation in the junior classes?

- We provide a variety of options for recording work, *e.g. drawing a picture to show the result; using ICT; using concrete materials to demonstrate how the result was obtained; using a diagram; telling/explaining*

3. Assessment and record keeping

(See Curriculum pp. 114-121, Teacher Guidelines pp. 64-65, the school's Assessment Policy)

- *The staff looks at results on both a class and school basis to see if there are areas of mathematics that can be improved?*

- There is an agreed whole-school approach to assessment in mathematics. We have agreement on

- Ensuring there is continuity and progression from class to class
- How often tests are given and to which classes?
- Teacher observation
- Teacher-designed tests and tasks
- Work samples, portfolios and projects
- Curriculum profiles
- Mastery records
- Diagnostic tests (mainly resource/learning-support)
- Standardised tests

- We ensure that a broad range of assessment tools are being used

- The information gathered during assessment is used in the following ways

- Assessment information is shared with parents. They are informed in time that a child needs help and they are given information on how to give help at home (See Parental involvement)
- Children are given feedback and encouraged to see assessment as a positive experience which helps them to ascertain progress and identify the steps that need to be taken
- Information is shared with other teachers and with other professionals if necessary

- The children are involved in the setting of personal targets, *e.g. number facts targets*

- There is whole-school agreement on the format and terminology used in record sheets
- Records are managed and stored in line with the school's policy on record keeping

4. Children with different needs

4.1 Children with learning difficulties

(Refer to school's Learning-Support Policy)

- The strategies used by teachers to ensure the participation of children with special needs in relation to mathematics are as follows
- Children with special needs are provided with access to all strands of the mathematics curriculum insofar as that is possible
- Teachers in mainstream classes provide a differentiated programme to cater for children with learning difficulties
- Supplementary teaching is available for children with learning difficulties in mathematics under the general allocation and low incidence resource hours
- There are regular meetings to ensure a collaborative approach between the class teacher and the learning-support/resource teacher
- ICT is used to support teaching and learning for children with special needs

4.2 Children with exceptional ability

- The strategies used in the school/class to provide challenges for children of exceptional ability are as follows:

- a differentiated programme
- independent research projects
- use of ICT to support their work
- facilitation to work with older/other pupils
- Arrangements are in place to liaise with their parents

5. Equality of participation and access

- Equal opportunities are given to boys and girls to participate in discussions, use of manipulatives, presentations

- All children have access to services, facilities and amenities in the school environment

6. Timetable

- All teachers are aware of the time allocation at each level for mathematics? (*Primary School Curriculum Introduction pp. 67 – 70)*

- When drafting timetables for withdrawal of pupils for supplementary teaching, teachers are including these pupils for as much of the mainstream mathematics programme as possible

- Timetabling issues are addressed in a multi-class situation in the teachers individual planning

7. Homework

- The staff has discussed the purpose of assigning mathematics homework to reinforce work done at school
- There is a balance in what we assign between written work and active concrete work
- Homework is differentiated taking into account the range of abilities within the class
- We ensure that children attending resource/learning-support are not going home with two sets of mathematics homework

- Mathematics homework reflects, where possible, the active learning approach as described in the curriculum

8. Resources

(Teacher Guidelines: Mathematics p. 18, pp.72-73)

<u>Equipment, textbooks, supplementary materials, calculators</u>

- Mathematics resources/materials

- Are stored centrally
- An inventory is kept on wall of resource room

- Materials, equipment, games, textbooks, supplementary books are selected when funds are available and if teachers identify a need for a particular item or book
- Specific resources are required by the learning-support/resource teacher and they collect and add to their store of materials over the years

ICT

(*Teacher Guidelines: Mathematics pp. 60-61, Information and Communications Technology (ICT) in the Primary School Curriculum: Guidelines for Teachers)*

- The internet is widely used to support the teaching of Maths. Teachers share expertise at their regular group meetings

- There is a code of practice to ensure safe Internet usage

9. Individual teachers' planning and reporting

- It is the individual class teacher's duty to ensure that he/she be prepared for the year ahead with their long term schemes and also prepared for their week to week work with their short term notes. Teachers are supported by colleagues in the planning process
- Cuntaisí Míosúla are collected by Deputy Principal monthly and stored in the office

10. Staff development

- Teachers are encouraged to attend courses
- They share the skills/expertise acquired at these courses at regular meetings where time may be allocated for same

- Opportunities for team-teaching occur with our allocation of low incidence resource hours. A number of teachers are availing of this opportunity and they are encouraged to give feedback to the rest of the staff

11. Parental involvement – home school links

(Teacher Guidelines: Mathematics p. 21 and also Guidelines for Parents – Your child's learning (Primary School Curriculum)

- Parents are made aware of the content of the mathematics programme at Parent Teacher meetings. Concerns that they may have can often be alleviated by dialogue and we strive to have an open door policy in school.

Success criteria

This plan will make a difference to the teaching and learning of mathematics in our school.

We intend to formulate a list of "milestones" for each class level that will indicate a base level of attainment.

The plan will guide us in our teaching and planning but it will also evolve as we improve on our teaching and learning Pupils enhanced learning shall be identified in their attainment of milestones and also in them reaching the objectives as outlined in the Maths Curriculum.

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Implementation

(a) Roles and Responsibilities

The Principal & Deputy Principal will oversee the implementation of this plan.

It will be presented to the staff as a reviewed policy during the school year 2013 /14 and implementation will take place during that school year

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Review

It will be necessary to review this plan on a regular basis to ensure optimum implementation of the mathematics curriculum in the school.

(a) Roles and Responsibilities

Those involved in the review will be:

- *Teachers*
- *Pupils*
- *Parents*
- *Post holders*

Ratification and Communication

Board of Management were presented with plan during the 2013/14 school year

Ratified on: _____

Signed: Chairperson BOM _____