Draft Document: Whole School Policy for Literacy and Numeracy

INTRODUCTION

The Sisters of Mercy have left a legacy of over a century and a half of contribution to the social fabric of the local community in Enniscorthy and their rich treasury of wisdom will endure at Coláiste Bríde, a Catholic secondary school operating under the trusteeship of CEIST (Catholic Education An Irish Schools' Trust), the core values of which are inclusive of the Mercy philosophy of education. Integral to our school's characteristic spirit is the vision of Catherine McAuley, Foundress of the Sisters of Mercy, which encourages each member of our diverse school community to lead by lived example, with intention, focus and accountability, modelling the faith and values of the school and upholding high standards and performance levels. The characteristic spirit of the school strives to honour its Mercy heritage and,finding expression in the emphasis placed on Catholic beliefs and practices, is dedicated to cherishing, and realising the full promise and flourishing of each pupil of every faith and none and respecting of the inherent dignity, autonomy and uniqueness of each person.

LITERACY AND NUMERACY STRATEGY

In July, 2011, the Minister for Education and Skills, Rúairí Quinn, launched the National Strategy to improve literacy and numeracy among children and young people, *Literacy and Numeracy for Learning and Life 2011-2020*.

Minister Quinn asserted, "This is an issue of equality. Without the skills of literacy and numeracy, a young person or adult is often denied full participation in society. They may be condemned to poorly paid jobs or unemployment and a lifetime of poverty and exclusion. This is why I am convinced that ensuring all our young people acquire good literacy and numeracy skills is one of the greatest contributions that we can make towards achieving equality and social justice in our country."

STATEMENT OF INTENT

Within a broad and balanced curriculum, our school's ethos helps us to encourage curiosity and creativity for life-long learning and discovery, and enkindles in our school members an intentional service to contribute to the common good and the transformation of society. Coláiste Bríde acknowledges that a key element of equal education opportunities provision is the fostering of good literacy and numeracy skills which are essential to the life prospects of each person and vital for the quality and equity of Irish society.

Coláiste Bríde is committed to raising the standards of literacy and numeracy of its pupilsin order that each pupil willmasterthese crucial skillsto the best of her ability. The focus of this policy is to sustain and build on the high levels of teaching and learning outlined in the very positive Whole School Evaluation report, received in February, 2011, by providing a formal framework for the implementation of the measures for the development of literacy and numeracy skills as presented in

the Department of Education and Skills' Strategy. Continual and consistent efforts to improveliteracy and numeracy standards, which may include providing extra available resources to those pupils with additional needs, willfurther enhance the opportunity for our pupils to participate fully in education and in all aspects of society and culture including local, national and global communities with the aim of making a "real, measurable and positive difference"[1] to their lives and will assist them in achieving their full potential.

AIMS OF THIS POLICY

The aims of this policy document are to:

- Support pupils' learning in all subjects by helping teachers to be clear about the ways in which their work with pupils contributes to the development of pupils' communication and numeracy skills;
- develop a shared understanding between all staff of the role of language and mathematics in pupils' learning and how work in different subjects can contribute to and benefit from the development of pupils' ability to communicate and complete mathematical tasks effectively;
- be conscious of the fact that good skills in language and numeracy skills are central to pupils' sense of identity, belonging and growth;
- elevate pupils' own expectations of achievement, thus raising standards;
- improve pupils' level of confidence and self-expression;
- promote knowledge and understanding of the pupils' standards of achievement and assessment in speaking and listening, writing and reading and mathematical computation;
- identify areas of strength and weakness and use this information to inform planning.

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[1]Literacy and Numeracy for Learning and Life: The National Strategy to Improve Literacy and Numeracy

THE ROLE OF THE LEARNING-SUPPORT TEACHER AND THE RESOURCE TEACHER

The role of the learning-support teacher is to provide additional teaching support to students with low achievement in the areas of literacy and numeracy.

- The learning-support teacher prioritises students who are performing at or below the 10th percentile on standardised tests of literacy or mathematics.
- The resource teacher may also provide additional classes in literacy or mathematics to students with special educational needs.
- The learning-support teacher / resource teacher may deliver this additional teaching support in a number of ways, including co-operative teaching with colleagues, small group or one to one support.
- The learning-support teacher may be responsible for the screening of in-take information and transfer data from primary schools (and previous secondary schools, where applicable). The data that will come from the primary school will comprise of results of standardized testing in second, fourth and sixth classes and a copy of the final report card from sixth class.[2]
- The learning-support teacher will share this information in a collaborative manner with subject teachers so that each teacher will be in an informed position to encourage and help students in all their subjects to develop their literacy and numeracy skills.

Literacy

In September each year the learning-support teacher administers the New Group Reading Test to all first year students. This along with the results of the CAT3 (entrance test), transfer data and psychological reports etc. is used to select students for learning-support.

The learning-support teacher / resource teacher will target the literacy support, in as far as is possible, to suit the needs of the particular student or group of students. The learning-support teacher will place significant importance on the development of Literacy and Numeracy skills when drafting the students' Individual Educational Plans (IEPs).

Literacy support may include the following:

- Structured reading programmes;
- targeted spelling programmes;
- revision of phonics;
- revision of spelling rules;
- oral language skills;
- comprehension skills;
- punctuation skills;

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[2]Circular 0056/2011 (Department of Education and Skills, 2011).

- reading for meaning;

- prediction skills;

- dictionary skills;

- mind mapping;

- mnemonics;

- skimming, scanning;

- memory games;

- puzzles, word-searches and scrabble.

In addition the resource teacher oversees a paired reading scheme involving transition year and selected first and second year students.

All learning support and resource students are encouraged to select from the large supply of books (including Barrington Stokes novels) available in the resource and learning-support rooms and the school library.

Numeracy

The CAT3 (entrance exam) is used to help select students for additional numeracy support.

As a general rule, additional teaching support in the area of numeracy is provided by the learning-support teacher through co-operative teaching in the classroom.

On occasions, small group or individual support may be provided in the area of numeracy by the learning support / resource teacher.

Numeracy support may include the following:

- Revision of fractions and decimals;

- working out percentages;

- revision of tables;

- telling the time;

- using a rough work sheet;

- using the calculator;

- sequencing skills;

- rules for integers;

- algebra basics;

- puzzles and jigsaws.

WHOLE SCHOOL POLICY FOR LITERACY

DEFINITION OF LITERACY

In the context of this document literacy is the term used to embrace all forms of language learning. It includes the capacity to read, understand and critically appreciate various forms of communication including spoken language, traditional writing and printed text, broadcast media, and digital media.

STANDARDS OF ATTAINMENT IN LITERACY IN IRELAND

One in ten children in Irish schools has serious difficulty with reading or writing. The literacy skills of students in Irish primary schools, measured by the National Assessments of English Reading, have not improved in over thirty years despite considerable investment. Employers and third-level institutions are calling for higher literacy standards among students leaving post-primary education. Meanwhile, there has been a decline in the performance of post-primary students in Ireland in international literacy tests.[3]

RATIONALE FOR LITERACY

ColáisteBríde is committed to promoting a better understanding of the critical importance of the core skill of literacy in all of its forms and improving our students' literacy skills so that they can become effective communicators.

For each individual communication, which includes the interdependent skills of talking, listening, reading and writing, is the gateway to social inclusion and being active global citizens. The development of literacy skills is vital to support our pupils' learning and raise standards across the curriculum because:

- Pupils need vocabulary, expression and organisational control to cope with the cognitive demands of subjects;
- responding to higher order questions encourages the development of thinking skills and enquiry;
- language helps us to reflect, revise and evaluate the things we do, and on the things others have said, written or done;
- improving literacy and learning can have an impact on pupils' self-esteem, motivation and behaviour;
- high standards of literacy allow pupils to learn independently and the ability to communicate is empowering.

[3]Ibid., 12, 13.

TALKING AND LISTENING

Talk is our main means of communication in everyday life and talking and listening are fundamental to the development of understanding. The teacher explains, questions, describes, organises and evaluates in the classroom and this may often be done orally.

The teaching staff in Coláiste Bríde aims to foster in its pupils the skills of:

- Listening with understanding and respond sensitively and appropriately;
- using speech appropriately and adjusting ways of speaking clearly and effectively, according to the audience;
- clarifying and expressing their ideas and explaining their thinking, using varied and specialized vocabulary according to context and purpose;
- active listening in order to help improve the students' skills of concentration and sensitivity to the speaker's viewpoint;
- increasing confidence and competence in speaking and listening so that they are able to adapt their speech to a widening range of circumstances including paired and group discussions and speaking to a larger audience and speak for a range of purposes e.g. to narrate, to analyse, to explain, to reflect and evaluate.

SUGGESTED STRATEGIES

Teaching in Coláiste Bríde aims to provide planned opportunities across the curriculum for pupils to engage in purpose talk, both formally and informally. In planning for talk the pace and timing should be considered, so that purposeful talk is maintained. The aim is to take account of demands on concentration to ensure that pupils are required to listen for realistic lengths of time.

The teaching staff in Coláiste Bríde aims to provide pupils with regular opportunities to speak and listen in the following contexts:

- In pairs with a working partner;
- in small groups with opportunities to take on the roles of chair or scribe;
- with the teacher or another adult;
- in whole class discussions;
- in presentations to a wider audience.

In these contexts some of the following activities may take place:

- Exploring and describing events, activities and problems, exploring and developing ideas with others;

- reporting back to a wider audience in order to consolidate ideas and understanding;
- asking questions as well as answering them;
- speculating, hypothesizing and imagining;
- planning, organising and reviewing activities;
- investigating and solving problems collaboratively;
- evaluating experiences and reflecting on learning;
- talking at length and adopting the 'expert' role.

READING

Reading from a wide variety of texts affords pupils the opportunity of learning from sources beyond their immediate knowledge. Fluent reading allows pupils to develop their potential as learners by understanding others' ideas from the past and present and to explore those of the futureby creating meaning and sense through the integration of information encountered in the texts and connecting it with existent knowledge, skills and understanding. The whole school and the individual classrooms shall reflect that reading is a worthwhile activity. The reading environment shall reflect a school philosophy to promote reading.

The teaching staff in Coláiste Bríde aims to foster in its pupils:
- The ability to make judgments about and respond critically to what is significant in a text;
- an enjoyment of reading and motivation in reluctant readers;
- the motivation to spell correctly;
- increasing confidence and competence in reading so that they are able to read fluently, accurately and with understanding;
- the skills necessary to become independent and critical readers and make informed and appropriate choices.

SUGGESTED STRATEGIES

All teachers should be aware of pupils' reading levels in order to make informed choices about appropriate texts and to plan appropriate support for pupils in order that they may successfully access texts. Opportunities may be taken to demonstrate pleasure in reading. Opportunities may be created in lessons for students and teachers to share their reading experiences.

The teaching staff in Coláiste Bríde may plan opportunities across the curriculum for pupils to:
- Read and follow written instructions;
- read and engage with narratives of events or activities;
- follow up their interests and read texts of varying lengths;
- question and challenge printed information and views;

- read with understanding descriptions of processes, structures and mechanisms;
- read and explore ideas and theories;
- learn how to sift and select, and take notes from text and read to locate and relocate information;
- learn how to scan for overall meaning and scan for key points, words and phrases;
- use reading to research and investigate from printed words and moving images ICT texts.

In selecting texts and generating texts (e.g. worksheets etc.), the following may be considered:

Scanning for overall impressions:

Print;

- is the print clear?
- are the lines of print short enough to be easily read?
- is the size and style of font appropriate?

Illustrations;

- are the illustrations appropriate? informative? attractive? accurate?
- are the illustrations representative? e.g. of the whole community?
- are the graphic clear? helpful?
- how well does the text relate to illustrations and graphics?

signposts;

- are headings and sub-headings clear? helpful?
- are the contents pages, index and glossary appropriate? clear?

quality;

- is the text balanced in its presentation of gender?
- is the text balanced in its presentation of different peoples and cultures?
- is the information accurate? up-to-date? reliable?
- is the content relevant and accessible to pupils?

Looking closely at a sample page:

Sentences;

- how long are the sentences?
- how complex are the sentences?
- are sentences mainly 'active' or 'passive'?

vocabulary;

- is the choice of vocabulary and terminology appropriate?

- are the difficult words made clear? e.g. re-phrased in the text?

cohesion;

- is the text clearly organised? logical? easy to follow?

<u>Asking students to comment:</u>

(Choose students to represent the full range of ability with which the text might be used.)

- What are their general impressions?

- can they use the index to find information?

- can they relate the illustrations to the text?

- can they read and understand the text?

- (Use a simple cloze test: copy a passage from the text and obscure every seventh word; if students cannot reconstruct the text to make reasonable sense, it is probably too difficult for independent use.)

- are there any words they don't know and can't deduce from the context?

<u>Assessing overall suitability:</u>

Use;

- how often will the text be use?

- which students would you use this text with"

- how would you use it with the students;

  - for background reading?

  - giving essential information?

  - stimulating interest and further enquire?

  - enjoyment?

- how will different students need to be supported in using this text?

WRITING

Many lessons include and depend on written communication. Writing development is recursive. Pupils do not learn particular features of written language once and for all at a specific stage. They shall therefore be encouraged to behave as independent writers throughout their school career, gradually developing the range, extent and subject content of their writing. They shall be exposed to fiction and non-fiction text types, including those whose language features involve recounting, reporting, explanation, instruction, persuasion and discussion.

In the role of observer, facilitator, model, reader and supporter of literacy skills, the teaching staff in Coláiste Bríde aims to foster in its pupils the skills to:

- Write in order to help sustain and order thought and to record;

- write logs and journals in order to clarify thoughts and develop new understanding;

- know when and how to plan, draft, discuss, redraft, reflect and proof-read their writing analyse and explore;

- learn the conventions of different forms of writing in different subject areas, e.g. by scaffolding pupils' writing and providing models of good writing;

- by providing frameworks for writing consisting of starters, connectives and sentence modifiers and provide clear models for communication;

- write coherently about a wide range of topics, issues, ideas and incidents, organising text in ways which help the reader;

- craft their writing, showing an improved control of grammatical structure and of a differentiated vocabulary;

- write at appropriate length, sometimes briefly;

- write collaboratively with other students;

- develop ideas and communicate meaning to a reader using wide-ranging and technical vocabulary and an effective style, organising and structuring sentences grammatically and whole texts coherently;

- have a high standard of presentation for their finished work clearly using accurate punctuation, correct spelling and legible handwriting;

- appreciate the differences between standard English and non-standard forms of the language;

- recognize appropriate form for their written responses so that they know when to respond in note form and when more formal constructions are required;

- apply word processing conventions and understand the principles of authoring multi-media text;

- understand the criteria for marking writing;

- present some writing for display or publication, showing varying degrees of ability.

- write in a widening variety of forms for different purposes e.g. to interpret, evaluate, explain,

THE LITERATE STUDENT

Please note that this list is neither definitive nor prescriptive.

At the end of her secondary school education a literate pupil shall:

- Use written language to express and reflect on experiences;

- write a formal and informal letter;

- write a report – a factual account of an event or situation;

- respond to and make sense of a range of reading materials, literary texts, data and media sources including internet and digital media;

- comment on the purpose, content and features of various advertisements and print media;

- describe, reflect and respond to a novel, short story, poetry, play or a film studied;

- review a novel, poem, play, film, song, or any other creative work studied;

- produce an original piece of creative writing, drawing on either an external stimulus, or on imagination;

- find and understand general and specific information from a variety of texts, e.g. signs, notices and instructions;

- be aware of the significance of pictorial and printed symbols;

- make appropriate use of written language when dealing with the normal demands of school and everyday life, e.g. use correct punctuation, address envelopes and cards correctly;

- apply a range of higher-order skills and strategies for reading comprehension, e.g. retrieving, questioning, inferring, synthesising, critical evaluation;

- use written or oral language to demonstrate the ability to listen and to retain information accurately, e.g. follow a sequence of instructions given by someone or summarise a story told by one or more people;

- use the spoken word to accurately express opinions and experiences in a social context, e.g. leave a message on a telephone answering machine.

ROLES AND RESPONSIBILITIES

THE ROLE OF THE ENGLISH TEACHER

The role of the English teacher may involve:

- The explicit teaching of the structure and function of written and oral language;

- providing dictionaries, glossaries and lists of appropriate subject vocabulary and encouraging students to use them;

- applying techniques such as skimming, scanning, and text-marking effectively in order to research and appraise texts;

- selecting information from a wide range of texts and sources including print, media and ICT and evaluating those sources;

- the explicit development of higher-order skills and strategies for reading comprehension (e.g. retrieving, questioning, inferring, synthesising, critically evaluating) in a wide range of contexts;

- the development of lower-order skills (handwriting, spelling, punctuation) and higher order skills and strategies (choosing topics, generating and crafting ideas, revising, editing) to support writing development;

- ensuring that there is systematic and explicit attention given to the teaching of a range of literacy skills in English including oral and aural skills, fluency, reading comprehension strategies, including the ability to respond critically, analyse, evaluate, describe, discuss, explore, reflect on, question and infer meaning.

- ensuring that systematic and explicit attention given to language awareness skills including functional and structural aspects of language, and competence in spelling, punctuation, sentence structure, paragraph organisation, awareness of the concept of style and knowledge of fundamental literary concepts.

- help students to use a range of strategies to learn spellings, including:
  - look   say   cover   write   check
  - making connections between words with the same visual pattern
  - exploring families of words;

- ensuring that there is systematic and explicit attention given to vocabulary development, writing skills and appropriate development of lower-order and higher-order skills, including the ability to express, explain, defend opinions, and to use language appropriate to context and audience in a range of literary forms;

- ensures that there is systematic and explicit attention given to the teaching of a range of literacy skills in English including oral and aural skills, fluency, reading comprehension strategies, language awareness skills including functional and structural aspects of language, vocabulary development, writing skills and appropriate development of lower-order and higher-order skills;

- increasing the awareness of the importance of digital literacy;

- encouraging students to read for enjoyment, and to write and communicate in a range of authentic contexts for different purposes with a variety of audiences;

- being familiar with the various strategies, approaches, methodologies and interventions that can be used to teach literacy and numeracy as discrete areas and across the curriculum.

ROLE OF TEACHERS OTHER THAN ENGLISH

All departments and all teachers have a crucial role to play in supporting students' literacy development.Teachers across the curriculum contribute to pupils' development of language, since speaking, listening, writing and reading are, to varying degrees, integral in all lessons. Helping students to express themselves clearly orally and in writing enhances and enriches teaching and learning in all subjects.

Teachers other than English may:

- Incorporate a strong emphasis on literacy and numeracy in lesson plans and the inclusion of explicit literacy and numeracy strategies into subject department plan;

- raise awareness of the importance of oral and written language in all its forms in lessons and foster a positive attitude in students to literacy and numeracy;

- incorporate specific reference to literacy and numeracy development in lesson and subject planning;

- work towards the development of lower-order skills (handwriting, spelling, punctuation) and higher order skills and strategies (choosing topics, generating and crafting ideas, revising, editing) to support writing development;

- increase the awareness of the importance of digital literacy;

- promote confident use of oral communication skills;

- encourage students to read for learning and leisure;

- be familiar with the various strategies, approaches, methodologies and interventions that can be used to teach literacy across the curriculum.

WHOLE SCHOOL POLICY FOR NUMERACY

NUMERACY

Repeated assessments of mathematics at <u>primary level</u> have revealed weak performance in important areas of the mathematics curriculum. The proportion of students who are taking Higher Level mathematics in the Leaving Certificate examination in Irish schools has been in the region of 16% for a number of years. The performance of students in Irish schools in international assessments of mathematics has declined in recent years.[4]Coláiste Bríde is committed to creating a greater awareness of, and more positive attitudes towards, mathematics and prioritising the raising standards in numeracy of its students.

DEFINITION OF NUMERACY

Numeracy is a proficiency which involves confidence and competence with numbers and measures. It is more than an ability to do basic arithmetic. Numeracy encompasses the ability to recognise situations where mathematical reasoning and skills can be applied to solve problems and meet the demands of day-to-day living in complex social settings. Numeracy is required for employment, facilitates an understanding of public issues and it makes possible an appreciation of games and sports. It requires understanding of the number system, a repertoire of mathematical techniques and an inclination and ability to solve quantitative problems in a range of contexts. It includes having spatial awareness and the ability to appreciate patterns and sequences. Numeracy also demands that the young person understands how data are collated through computation and measurement. Individuals need to be able to make sense of this numerical information and select appropriate ways to present it, in graphs, diagrams, charts and tables.

WHAT A NUMERATE STUDENT MAY BE ABLE TO DO

Please note that this list is neither definitive nor prescriptive.

A numerate student shall:

- Have a sense of the size of a number and where it fits into the number system;
- recall mathematical facts confidently;
- calculate accurately and efficiently, both mentally and with pencil and paper, drawing on a range of calculation strategies;
- use proportional reasoning to simplify and solve problems;

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[4]Literacy and Numeracy for Learning and Life: The National Strategy to Improve Literacy and Numeracy among Children and Young People (Department of Education and Skills, 2011), 13.

- use calculators and other ICT resources appropriately and effectively to solve mathematical problems, and select from the display the number of figures appropriate to the context of a calculation;

- use simple formulae and substitute numbers in them;

- measure and estimate measurements, choosing suitable units, and reading numbers correctly from a range of meters, dials and scales;

- calculate simple perimeters, areas and volumes, recognising the degree of accuracy that can be achieved;

- understand and use measures of time and speed, and rates such as € per hour or kilometres per litre;

- draw plane figures to given specifications and appreciate the concept of scale in geometrical drawings and maps;

- understand the difference between the mean, median and mode and the purpose for which each is used;

- collect data, discrete and continuous, and draw, interpret and predict from graphs, diagrams, charts and tables;

- have some understanding of the measurement of probability and risk;

- explain methods and justify reasoning and conclusions, using correct mathematical terms;

- judge the reasonableness of solutions and check them when necessary;

- give results to a degree of accuracy appropriate to the context;

- be aware of materials, shape and space;

- be aware of pattern and difference, classifying, matching, comparing and ordering;

- recognise that she can effectively describe and explain her work through a balance of prose, diagrams, tables, graphs, charts, symbols and formulae;

- be able to make the transition from concrete, tactile, kinaesthetic abilities to auditory and analytical skills.

ROLE OF THE MATHS TEACHER

The Maths teacher may:

- Include explicit literacy and numeracy strategies in the Maths Department Plan;
- incorporate a strong emphasis of literacy and numeracy skills into maths lessons;
- be aware of the mathematical techniques / process skills which overlap from other subject areas and provide assistance and advice to other departments, so that a correct and consistent approach is used in all subjects;
- help students to develop a deeper conceptual understanding in mathematics and the ability to apply mathematical concepts in a range of real-life every-day scenarios;
- assiststudents in understanding and communicating information presented in mathematical terms;
- help students develop their ability to explore, hypothesise and reason logically and to use a variety of methods to solve problems;
- ensure the development of young people's skills in carrying out procedures flexibly and accurately;
- provide opportunities for students to handle data in a range of contexts and to make and monitor decisions about the collection and representation of data;
- infuse language, thought and meaning into mathematics teaching;
- use open-ended challenging tasks that motivate young people to engage with problem-solving in a meaningful way;
- provide information to other subject teachers on appropriate expectations of students and difficulties likely to be experienced in various age and ability groups;
- liaise with other teachers, attempt to ensure that students have appropriate numeracy skills by the time they are needed for work in other subject areas;
- seek opportunities to use topics from other subjects in mathematics lessons;
- be familiar with the various strategies, approaches, methodologies and interventions that can be used to teach numeracy as a discrete area and across the curriculum;
- continue to implement Project Maths;
- provide opportunities for students to acquire confidence and fluency in using mathematical language when deciding the mathematics and equipment to use, planning and organising work, conjecturing or hypothesising, generalising, explaining methods and justifying their use and presenting results and conclusions with reasons;
- provide opportunities for students to apply mathematical processes at a level commensurate with the mathematical content covered;

- provide opportunities for students to work collaboratively so that through discussion they can develop their mathematical language and organise their thinking for selecting mathematics and resources to judge their suitability for a range of applications, recording their work, discussing and evaluating their choices;

- plan regular opportunities to use mental computation to improve estimation skills, consolidate quick recall of table facts and prolong the students' memory of computational skills and firm up their understanding in using these;

- provide access to a broad and balanced curriculum for pupils with special educational needs, ensuring that students experience work in all attainment targets.

"Teachers of all post-primary subjects have an important role to play in developing and consolidating students' ability to use numeracy."[5]

Teachers of subjects other than mathematics may:

Identify what successful numeracy strategies are already embedded in current classroom practice, document what works well and plan incremental reconstruction of other strategies;

incorporate a strong emphasis on literacy and numeracy in lesson plans and the inclusion of explicit literacy and numeracy strategies into subject department plan;

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;

identify and plan for the numeracy demands/opportunities within the subject (by topic/by chapter) and identify the connections with numeracy that are essential and meaningful;

identify the numerical knowledge and skills required and be aware of appropriate expectations of students and difficulties that might be experienced with numeracy skills;

provide information for mathematics teachers on the stage at which specific numeracy skills will be required for particular groups;

provide resources for mathematics teachers to enable them to use examples of applications of numeracy relating to other subjects in mathematics lessons;

become familiar with the various strategies, approaches, methodologies and interventions that can be used to teach numeracy across the curriculum;

encourage a balanced practice between mental computation and the use of calculators;

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[5]Literacy and Numeracy for Learning and Life: The National Strategy to Improve Literacy and Numeracy among Children and Young People (Department of Education and Skills, 2011), 11.

MANAGEMENT OF THE WHOLE-SCHOOL LITERACY AND NUMERACY PLAN

The role of the Senior Management Team may involve:

- engaging the whole staff in conducting a review of the literacy and numeracy provision currently available in the school and the range of interventions already being employed for the improvement of literacy and numeracy standards in the school with the aim to establishing a comprehensive and coordinated literacy programme (e.g. school policies on retention, attendance, spelling, homework, presentation of work);

- identifying improvement in literacy and numeracy standards as a priority for the school and establish and maintain a policy on improving literacy and numeracy standards;

- setting up and support the appropriate structures such as a literacy committee, possibly comprising of a Literacy Co-ordinator, two English teachers, two mathematics teachers, Management Representative, Learning Support/Resource teacher and others, responsible for developing and implementing a plan for a whole school approach to literacy development;

- evaluating current teaching practices with regard to literacy and numeracy and identify areas for improvement;

- putting in place structures to review, monitor and evaluate the literacy and numeracy development plan on an annual basis;

- evaluating the efficacy of assessment and evaluation measures in the school and make adjustments as necessary;

- assessing the performance of students at the end of second year (beginning 2016) and use data from these assessments to establish the existing levels of achievement;

- using assessment data to inform national educational policy for literacy and numeracy;

- using assessment information as a source of evidence for the school community to monitor progress and interpretattainment levels with a view to informing planning and adjusting actions as necessary;

- setting challenging but realistic goals for improvement in literacy and numeracy targets, focussed on the progress of every student;

- participating in the planning, implementation and evaluation of the whole school literacy and numeracy strategy;

- determining the role of the Numeracy Co-ordinator;

- specifying expectation of the active role to be played by all teachers in the consolidating the critical core skills of literacy and numeracy;

- ensuring the provision of co-ordinated support for literacy and numeracy across the curriculum;

- regularly reviewing the literacy and numeracy policy and support and maintain the implementation of strategies and provision of resources to improve the standards in literacy and numeracy;

- supporting newly qualified teachers in addressing literacy and numeracy;

- creating a culture of continuous improvement and shared goals;

- supporting the development, implementation and integration across the curriculum of a whole school literacy and numeracy policy;

- providing resources for English and mathematics teachers and other teachers in the school;

- providing finance for material resources and ensure efficient use of available resources;

- providing opportunities for effective communication between the Literacy and Numeracy Co-ordinator, the Senior Management Team, the English, Mathematics and ICT Departments and other departments so that numeracy, literacy, special educational needs and ICT provision is integrated;

- identifying and make provision for the training needs of staff in the form of relevant and focussed continuing professional development, encouraging principals, deputy principals and teaching staff to continually reflect, improve and upskillthroughout their professional careers;

- supporting and encouraging staff involved in the project to maintain sustained effort and focus;

- monitoring the effect of the implementation of Project Maths on mathematics standards using a range of indicators;

- providing parents with copies of the NCCA explanatory leaflets when issuing written reports to parents about standardised score tests;

- continuing with attendance monitoring and tracking and informing parents of absences, ensuring that the EWB (Education Welfare Board) is informed of absences as necessary and acknowledging and rewarding excellent attendance.

ROLE OF THE LITERACY AND NUMERACY CO-ORDINATOR

The Literacy and Numeracy Co-ordinator involves supporting departments in the implementation of strategies and encourages departments to learn from each other's practice by sharing ideas.

The role of the Literacy and Numeracy Co-ordinator may include:

- initiating, implementing and driving the school-wide enrichment action;
- liaising with subject departments and teachers, learning support, management and feeder primary schools;

  establishing a programme and calendar for literacy and numeracy development and events in the school;
- identifying the strategies already in place for assessment and evaluation;
- working with the senior management team to determine strategies for dealing with literacy and numeracy across the curriculum for all teachers to ensure the effective development and implementation of a whole school literacy and numeracy policy;
- establishing lines of communication and ensure that there is constructive liaison between the mathematics teachers and teachers of other subjects;
- establishing lines of communication and ensure that there is constructive liaison between the English and mathematics teachers and feeder primary schools;
- monitoring the implementation of the whole school literacy and numeracy strategy;
- targeting available resources on enhancing provisions designed to improve the learning opportunities and achievements of students;
- helping parents to take an active interest and support their children's literacy and numeracy development;
- evaluating the effectiveness of the strategy and make modifications where necessary;
- facilitating amendments to the literacy and numeracy strategy in the light of evaluation and curriculum changes.

TEACHING AND LEARNING

This policy promotes teaching that:

- is informed by clear, challenging and progressive objectives and a shared set of goals;
- aims to create print rich, literate environments in the classrooms;
- encompasses purposeful, direct and explicit learning experiences;
- is managed in such a way as to allow pupils frequent opportunities to make oral contributions, answer open-ended questions and ask relevant questions;
- is highly interactive and encompasses learning experiences in classroom environments that are conducive to questioning and answering;
- is inspiring and motivating, inclusive and ambitious;
- is varied in style and distinguished by a fast pace and strong focus;
- is well-pitched to pupils' needs;
- enables students to acquire new skills and integrates and consolidate the skills in written and oral language and numeracy that they have already learned;
- encourages and supports clarity around standards expected and achieved;
- ensures understanding of terminology, e.g. RA (reading age) etc.;
- uses an effective blend of teaching approaches including direct skill-based differentiated instruction, individualised learning and the use of structured cooperative group work;
- reflects the reading interests of all students and offers them a balance of text types;
- promotes collaborative interaction between teachers and students;
- supports the learning of students with additional support needs, including students whose first language is not English or Irish and students who are experiencing difficulties;
- create a reading ethos in the school;
- monitors and evaluates pupils' oracy skills.

The Strategy promotes learning that:

- is active and highly-motivated;
- is purposeful;
- is creative and imaginative;
- is reflective;
- is secured in use and meaningful in context;
- is increasingly independent and self-motivated;
- motivates pupils to take increasing responsibility for recognising their own literacy needs and making improvements;

- harnessed to personal or group targets;

- involves collaboration with teachers and with other students;

- permeates all work, enabling pupils to realise the purpose of literacy and numeracy and to become more confident in the transference of skills to other subject areas, e.g. processes in mathematics provides additional opportunities for pupils to develop their understanding of mathematical vocabulary through talking, listening, recording and writing.

PLANNING AND ASSESSMENT

Planning in Coláiste Bríde is specific, rigorous, thorough, measurable, achievable, challenging, realistic and adheres to a timeframe. The successful implementation of this literacy and numeracy policy is dependent upon the extent to which the staff in Coláiste Bríde takes account of the needs of all students, with regard to ethnicity, ability and social and cultural factors.

Planning for literacy and numeracy aims to:

- adopt current objectives outlined by the DES with a view to inclusion in planning for and assessing literacy skills;

- increase the time devoted to the teaching of literacy and numeracy;

- raise the awareness of all staff (both teaching and non-teaching) about their responsibilities for the development of literacy and numeracy at all levels;

- promote the improvement of literacy and numeracy standards and identify good practice for literacy and numeracy;

- ensure inclusion and differentiation;

- ensure the transference of relevant information between the relevant education providers to facilitate the continuity and progression for the child;

- provide guidance for all teachers on how they can support students' literacy development across the curriculum;

- identify and make provision for the professional development needs of staff with regard to literacy and numeracy;

- foster effective and sustained links between the Literacy and Numeracy Co-ordinator and the Special Educational Needs Co-ordinator so that literacy, numeracy and special educational needs provision is integrated;

- share best practice, forge links and build supportive networks of communications with other schools;

- recognise how resources will be organised to support the literacy and numeracy strategy;

- make appropriate use of Information and Communications Technology (ICT);

- structure lessons appropriately in ways that support and stimulate language development and engages with those learning approaches, including cooperative learning, differentiated learning, active learning and problem-solving activity;

- incorporate a systematic "learning outcomes" approach into all subject plans, outlining the skills and competences expected of learners at the end of each stage of their learning;

- encourage and consolidate teaching approaches which are broad and balanced and which interweave the strands of literacy and the strands of numeracy where opportunities arise;

- incorporate into each subject plan a strategy specific to the subject for identifying progression in the main forms of reading, writing, speaking, listening and numeracy skills undertaken in each department to ensure coverage and progression across the key stages and strengthen teaching andlearning accordingly;

- adapt the identified literacy cross-curricular priorities for each year to ensure the transference of literacy and numeracy skills across the curriculum;

- strengthen the links between the school and the home by building effective working relationships with parents with a view to integrating parental engagement and encouraging parental participation as a core part of the literacy and numeracy plans of the school;

- target and coordinate support for initiatives that provide parents with literacy difficulties with information and disseminate information about on-line resources about activities that they can use to support their child's literacy and numeracy development;

- take active steps to inform parents of the standards being achieved and the goals the school aims to achieve in order to heighten parents' interest in becoming involved in helping to raise their child's literacy and numeracy standards;

- engage with supports such as public libraries, health services, family resource centres and adult and family literacy services with a view to encouraging parents to avail of opportunities to participate in family literacy groups;

- support parents in how to understand reports about their child's progress in school;

- encourage parents to ensure that their child attends school every day;

- effect a change in the reading culture and patterns that have resulted in the erosion of traditional learning blocks (fairytales, fables, rhymes etc.);

- increase the RA (Reading Ability) of incoming first year students to enable them to better decipher the traditionally used texts in first year;

- continue to support the acquisition of a wide range of books and other materials and educational resources for the school's in-house library facility;

- interpret and use the attainment levels of all pupils through teacher observation and interpretation of standardised tests to inform future literacy planning;

- lead to robust, evidence-based school self-evaluation;

- support the learning needs of students who come from socially and economically disadvantaged backgrounds, students whose first language is not English and students who are exceptionally able to the level of their capacity in an inclusive way;

- identify those pupils underachieving in literacy across the curriculum and address their specific weaknesses with appropriate teaching strategies;

- audit existing literacy provision and review current support for students with individual needs;

- promote the use of available guidelines and online resources for schools on best practice in supporting the needs of students with special educational needs;

- encourage detailed, accurate record-keeping.

ASSESSMENT

DES Circular 0056/2011 states that primary schools are directed from 1st June 2012 to send a copy of the end of year report card for each student to the secondary school in which the student has enrolled. The report cards should includealso information from standardised tests and is invaluable in assisting self-evaluation of teaching and learning, specifically of literacy and numeracy skills, in Coláiste Bríde, and in the formation of school improvement plans. Resources for students with special educational needs will be applied for as soon as is feasible.

Coláiste Bríde is equipped with a software package which provides assistance in recording and analysing assessment data. This data is used to monitor the progress of each student's attainments in:

- standardised literacy and numeracy tests (from both primary and secondary school);
- Christmas tests, Mock exams, summer tests and state examinations.

This data will inform and support target setting for the improvement of attainment in literacy and numeracy.

Assessment shall:

- Make explicit to the pupils the key features of language and numeracy which will be considered;
- be consistent and data from standardised tests and other sources may be analysed to track trends over time;
- carefully monitor learners' progress in literacy and numeracy at each stage of development;
- identify students' learning needs as early as possible, allowing issues to be addressed and ensuring that they do not become a barrier to learning as the student progresses;
- inform planning and have an impact on teaching and learning interventions;
- make reference to the objectives from the framework for teaching mathematics and English;
- provide useful data for the school's self-evaluation process, reflective practices, school improvement plans and inform target-setting;
- use a continuum of well-considered assessment approaches to determine the next steps in learning and planning approaches to teaching to suit the needs of learners;
- provide students and parents with feedback on progress and clear suggestions for the next steps that they should take to improve their learning;
- inform national education policy for literacy and numeracy;
- include judgements about the progress pupils are making based on different sources of evidence, including conversations with the learner, an analysis of the learner's own self-

assessment, the teacher's observations of the learner's engagement with tasks, test scores, examples of students' work and written, oral and practical examinations;

- combine good assessment for learning practice with appropriate assessment of learning (AoL) approaches. These are the approaches that provide an indication of the progress that he student has made in achieving the learning outcomes that are set out in the curriculum. Assessment of learning should provide a summary of what the student has achieved at fixed points, such as the end of an academic year. The information on students' progress may come from teachers' informed judgements, the students' performance on tests or tasks constructed by the teacher or school, the students' performance on standardised assessments and performance in state examinations.

EVALUATION

When responding to pupils' work the staff in Coláiste Bríde may:

- make comments which are positive and supportive;

- target specific areas for improvement (a selective and focused identification of errors);

- provide guidance on how to achieve the short-term targets set. For example, whilst "improve your spelling" is unhelpful and vague, the identification of a particular spelling error, e.g. doubling of letters before adding –ing is specific and presents the student with a target which can be addressed;

- create opportunities for students to reflect on the quality of their own work and for peer assessment.

The Strategy will be monitored and reviewed through:

> the school and departmental development plans;
>
> lesson observation;
>
> sampling pupils' work;
>
> discussion with staff, parents and governors;
>
> reviewing planning;
>
> analysing assessment data;
>
> discussion of students

Information provided from the monitoring and review process will inform decision making about improvements and further developments.

SCHOOL SELF-EVALUATION FOR LITERACY AND NUMERACY

During the next academic year (2013/14), under the themes of Literacy and Numeracy, we aim to self-evaluate:

1. preparation for teaching;
2. teaching approaches;
3. students' engagement with learning.

We will evaluate these three themes with specific focus on:

1. attainments in literacy;
2. attainments in numeracy.

The evaluation methods/tools we may use at both whole school level and subject department level include:

- eliciting views of students, parents and teachers by questionnaires/focus groups/ interviews;
- collaborative teaching and review;
- teacher discussion and reflection;
- peer observation of teaching and learning;
- review of students' work;
- review of students' work;
- review of written plans;
- student interviews;
- analysis of information on students' attainments and achievements with regard to literacy and numeracy skills;
- analysis of information on students' attainments and achievements with regard to literacy and numeracy skills;
- comparison of the outcomes of standardised tests with national norms (when available).
- comparison of the outcomes of state examinations attainments in English and mathematics.

SHORT TERM ACTION PLAN 2012/13

Create a literacy and numeracy rich environment by:

- displaying key word posters into English and maths subject classrooms and displayed in key areas of the school;
- applying to the Parents' Committee to provide funding for Keyword Journals for the incoming First Year cohort of 2013;
- establishing key word lists for each subject area;
- exhibiting a map of the school with dimensions of classrooms;
- displaying directional signs, e.g. giving directions to destinations;
- showing a count-down to exams/holidays;
- adopting DEAR (Drop Everything And Read) for a specific week in the school calendar;
- presenting everyday numeracy as often as possible in all subject areas;
- including numeracy in the teaching of all subject areas, e.g. students calculate their own percentages in subject tests;
- ensuring that each classroom has a functioning wall clock.

LONG TERM ACTION PLAN 2013/14:

- Display key word posters into all classrooms;
- review and expand achievement awards;
- promote and reward homework and study achievements;
- make provision for more regular subject department meetings to facilitate planning;
- increase the number of students sitting the higher level maths paper and the higher level English paper at both Junior Certificate and Leaving Certificate examinations;
- introduce a study skills module for specific year groups at the beginning of the school year;
- arrange special events to acknowledge literacy and numeracy in subject specific weeks e.g. science week, maths week.

Planning and Implementing a School Wide Approach to Numeracy Development in Coláiste Bríde

The following planning and development document can be used and adapted by teachers in Coláiste Bríde. It includes some examples of the impact of numeracy across the curriculum. Please note that this document includes a set of examples and is not a complete, definitive or prescriptive list.[6]

A similar document may be formulated by each subject department to include some examples of literacy across the curriculum and may be included in subject and lesson planning.

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[6] Jerry McCarthy, Numeracy Advisor, Associate JCSP/PDST Support Service.

ART

Representation and Spatial and Geometric Sense:

- use of patterns and image enlargement / reduction;
- scale drawing;
- proportion and scale;
- 2D and 3D properties;
- 3D shapes and their nets;
- use grids for enlargement and reductions e.g. draw a grid over a small picture using pencil and ruler in 1cm increments; then redraw the grid onto a large sheet using 1:3 to enlarge;
- many artistic patterns and constructions in our own and other cultures are based on spatial ideas and properties of shapes, including symmetry;
- use and application of scale and proportion;
- use and application of symmetry;
- paint mixing as an application of ratio;
- study of the use of squares and rectangles in the work of artist Piet Mondrian;
- study of the use of quadrilaterals in the work of artist Henri Matisse;
- study of the use of symmetry in the work of artist William Morris;
- study of the use of tessellation, circles and quadrilaterals in the work of artist Bridget Riley;
- patterns and symmetry within weaving and patchwork;
- use of Tangrams – an old Chinese puzzle of seven polygons that are cut from a square;
- use of a timeline to depict events in art history;
- repetition, symmetry and tessellation in art;
- use of mathematical shapes for drawing, e.g. ellipses, cubes etc. The Golden Section and Leonardo da Vinci;
- investigation of the Bayeux Tapestry;
- the numerical ideas of pattern and shapes are taught in art and design, e.g. through cubism or the tessellations of Escher;
- link work on perspective to the development of enlargement and scale factor in numeracy;
- work in art and design can support the understanding and construction of shape, space and measures;
- layouts on Graphic Arts;
- multimedia – film and graphics (2D);
- scale diagrams in Construction Technology;
- CADD;

- design briefs using PC;

- make origami and paper aeroplanes – accurate measuring, folding and understanding of 2D shapes, together with the vocabulary for these activities;

- cake decorating;

- designs for textiles;

- designs for kites;

- designing a pop-up card;

- advertising – travel brochures – interpret maps.

Measures and Measurement:

- Measuring lengths, areas and volumes, angles;

- through the planning and investigation process, estimate the amount of material needed to make a number of components for an art project.

Measurements are regularly needed in art:

- Use of measuring instruments;

- different paper sizes   -   how are they related?

                                          -   what about envelope size?

- different thicknesses of paper;

                                                     -   what are they called?

                                                     -   what are they used for?

- the quantities that paper is sold in;

- the weight of the paper;

- Permitted levels of tolerance in measurement in art assessments, graphic design and in art constructions;

- Designing and creating the maps of different countries (i.e. measuring, using approximations, halving, sub-dividing etc.);

- measuring time to complete an activity;

- measuring length and angles.

Number Sense and Computation:

- Apply ratios to solve problems, e.g. be able to mix paint using colour ratios;

- understand and use equivalences between commonly used percentages, e.g. add stated percentages of colour to the origin colour to create a monochromatic scheme of colours;

- understand and use equivalences between commonly used percentages, e.g. design a newspaper pager with 25% of the area dedicated to advertisements;

- use and application of time lines (of famous artists);

- dates and calendar;

- currency conversions / trade of artefacts;

- sequencing and ordinal arrangements;

- use and application of ratio and proportion, e.g. use of paint mixing as a ratio application;

- use and application of scale;

- use and application of proportion;

- designs may need enlarging or reducing, introducing ideas of multiplication, scale and ratio;

- the number of primary colours;

- the number of secondary colours;

- the number of colours in the spectrum;

- editing, e.g. film sequences;

- Computer Generates Graphics (image manipulation);

- using skills of estimation and comparison.

Numeracy Language and Communication:

- Numeracy Keywords;

- key phrases in numeracy;

- key symbols of numeracy

- using numerical vocabulary correctly and precisely

- explaining and justify their methods and conclusions;

- use of consistent and precise language and terminology for shapes and their properties;

- art and design can contribute to the development of students' problem-solving, communication and reasoning;

- defining similar shapes, congruent shapes etc.

Science

Representation and Spatial and Geometric Sense:

- Using shapes of objects to understand friction, resistance and streamlining;
- symmetry in the natural world, e.g. butterflies, leaves, camouflage;
- fibonacci spirals in the natural world, e.g. fir cones, sunflowers, snails;
- the repetition in life cycles of animals and plants.

Measures and Measurement:

- Using (and making) recording measurements with appropriate precision;
- using an appropriate range of units of measurement and considering the required degree of precision and accuracy;
- recalling the approximate magnitude of appropriate physical quantities in order to make sensible comparisons;
- organise the available timeframe to complete the required task, e.g. planning and conducting an investigation over 1-2 weeks;
- select and use appropriate measuring instruments and units in the course of conducting experiments and investigating;
- measure and record measurements;
- demonstrate the correct use of vernier gauge, micrometer, pipette, graduated cylinder, thermometer, degrees Celsius, degrees Fahrenheit etc.;
- use measuring equipment with precision and accuracy to collecting data for investigations and experiments;
- make appropriate conversions between units of measurement;
- use information about one scientific event to determine and predict the timeframe of another ;
- estimate the position of an object after reflecting off a surface;
- estimate distance between planets;
- making a timing device using a pendulum, sand, water, springs, etc.;
- measuring instruments used in the science laboratory;
- practical results – measurement: time . weight/ volume;
- analysing graphs;
- which (x) was fastest / most reactive;
- measuring the time it takes for a certain mass to dissolve;
- predict what might happen in an experiment;

- measuring the diameter of a single pea, from a pod;

- measuring lung capacity;

- using shadows to study the movement of the sun;

- costing vegetables and finding the variety that is best value for money;

- measuring and recording growth of plants;

- measuring compost in litres;

- using a sieve to determine if the potato was too small for sale;

- reading scales;

- that timescale in the growth of a plant;

- observations, drawings and record-keeping of the growth of plants;

- recording of pulse and breathing rate before and after exercise;

- investigation of heat insulation.

Data Sense, Handling and Interpretation:

- 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. Students will, for example, order numbers, including decimals, calculate 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. They will explore rates of change in cooling curves and distance-time graphs, apply formulae and solve equations, for example, in problems on moments;

- representing data accurately using appropriate graphs, charts and tables, identifying patterns and trends, interpreting effectively and making predictions;

- present and display information collected in an investigated project using a pie chart, line graph, bar chart etc.;

- collect scientific data from a variety of sources to determine relationships between two variables. Use the trends apparent from the graphs and tables to determine trends, e.g. the graph of time versus temperature;

- analyse data from statistic surveys and calculate the percentage of data in a given category;

- representing and interpreting tables, graphs and data from experiments;

- cause and effect;

- tabulating and graphing data;

- reading scales;

- pie charts of food groups;

- bar charts of daily calorie intake;

- calorie counting;

- use first-hand and secondary data to carry out a range of scientific investigations;

- exploregrowth and how to measure it. Explore the range of heights in the class, and compare to data of expected heights;

- compare data about individuals, produce graphs of variation for particular features and investigate correlations.

In the area of Data Sense, Handling and Interpretation, teachers of science may consider the following when deciding how work in science links with using and applying numeracy in Coláiste Bríde:

- What aspects of handling data are developed during science lessons? How are ICT devices used in this work (for example, sensors, spreadsheets, computer graph packages, calculators, graphical calculators)? How does this work enhance students' mathematical development?

- How does science help to develop students' understanding of numbers in context, particularly large numbers, fractions and decimals, indices, ratios and proportions, and the relationship between different metric units?

- Does the teaching and interpretation of formulae and graphs support the expectations in numeracy? What use is made of different forms of graphs in science? Have we agreed with numeracy how graphs should be labelled and presented? Does the progression in graphical work in science support its development in numeracy? How is ICT used (graph plotters, graphical calculators) to support this work?

Number Sense and Computation:

- Opportunities for counting and measuring, e.g. how many seeds in a pod?
- performing mental calculations;
- counting, classifying, estimating, ordering numbers;
- calculating means and percentages;
- use strategies, estimation and contextual knowledge to confirm calculations and answers are reasonable;
- timelines (geological);
- using / reading stop watches;
- use number sense and knowledge of scientific facts to determine the accuracy of calculations within reasonable limits. Given that the average pulse rate is between 60 and 90 beats per minute, students can determine the accuracy of calculations of average pulse rate, and the determination of actual pulse rate, when it is measured as beats per 15 seconds and converted to beats per minute;

- select and use simple and formulae to solve numerical problems;

- use percentages to calculate and solve problems;

- calculate the fat content of commonly eaten foods using a calorie counter or fat – fibre guide;

- use numbers sense, appropriate strategies, computational skills and key information to solve numeracy problems, e.g. given the formula for speed, calculate the speed when given the start and finish times and distance travelled;

- read, write, compare and order positive and negative numbers, e.g. use thermometers to measure temperatures in the environment;

- understand and use equivalences between commonly used percentages, e.g. use an understanding of percentage of fractions when discussing the reduction of biodiversity;

- calculating with formulae;

- 3-way relationships, e.g. Density / Mass / Volume   Speed / Distance / Time

- Voltage / Resistance / Current;

- rearranging formulae;

- the relationship between pressure and wind speeds;

- comparisons between climates from different parts of the world. Interview people who have lived outside of Ireland;

- understand and use the substitution of numbers into simple formulae, e.g. distance / time to determine average velocity or mass / volume to determine density.

In the area of Number Sense and Computation, teachers of science may consider the following when deciding how work in science links with using and applying numeracy in ColáisteBríde:

- How does science help to develop students' understanding of numbers in context, particularly large numbers, fractions and decimals, indices and the relationships between different metric units?

- Are students encouraged to estimate answers to calculations, make sense of an answer, check the reasonableness of a number and use mental methods and jottings as appropriate?

- Is support given to methods and approaches to written calculations that are used in maths lessons?

- Can a consistent approach to problem-solving, investigations and enquiry-based approaches be adopted?

Numeracy Language and Communication:

- Numeracy Keywords;

- key phrases in numeracy;

- key symbols of numeracy;

- using numerical vocabulary correctly and precisely;

- explaining and justify their methods and conclusions;

- discussing word problems;

- test explanations by using them to make predictions and by seeing if evidence matches the predictions.

Geography

Representation and Spatial and Geometric Sense:

- Draw a scale map of the school;

- maps, coordinates, angles, direction, scale and ratios;

- using grid references on a street directory, locate a particular site;

- use latitude and longitude to locate sites in the atlas and explain whterh they are located in the southern or northern hemisphere;

- reading latitude and longitude coordinates;

- using scale to determine real distances;

- use a sense of direction and scale when drawing and interpreting maps and plans;

- draw a sketch map of the local bus route, identifying major land uses in terms of natural and man-made features. Estimate the distances and provide a suitable scale;

- use an aerial photograph to construct a topographical map with symbols and appropriate scale. Construct a contour cross section from a topographical map or make a 3D model;

- use grids for enlargement and reductions, e.g. draw a grid over a small picture using pencil and ruler in 1cm increments; then redraw the grid onto a large sheet using 1:3 to enlarge;

- using atlases, travel guides and wall maps to locate the places in the journey;

- compare and contrast wind directions and pressure systems in the northern and southern hemispheres;

- provide opportunities to students to make statistical enquiries, e.g. in analysing population data , to explore and compare lifestyles; they will also use a wide range of measurements and rates of change;

- atlas (coordinates);

- find the treasure;

- geological / geographical mapping;

- coordinate – world map;

- mapping earthquake sites / volcanoes;

- design a tour map of the east end of Dublin using grid references;

- use of grid references and compass points for location, direction, distance, size and scale;

- comparison of maps and globes in order to see how a rounded surface may be represented on a flat surface;

- internet map searches;

- internet photograph searches of main features of an area;

- plotting routes, e.g. adventure climbs, sailing competitions, charity walks, cycle rides and expeditions.

  In the area of Representation and Spatial and Geometric Sense, teachers of Geography may also consider the following when deciding how work in Geography links with using and applying numeracy in Coláiste Bríde:

  - How does teaching within geography support work on co-ordinates and measures?
  - How are graphs and charts used in geography?
  - Are labelling conventions consistent with numeracy?
  - How does teaching within geography support work on co-ordinates and measures?
  - How are graphs and charts used in geography? Does their development support the progression outlined in the teaching programmes for mathematics? Do the labelling conventions for graphs match those of the mathematics department?

Measures and Measurement:

- Using a wide range of measuring instruments to facilitate the accurate measure of data, such as distance, rainfall or temperature;
- Maps, co-ordinates, angles, direction, scale and ratios;
- Chronology using a time line;
- Read a bus or train timetable and establish appropriate routes of travel to get from A to B in the shortest time. Discuss what impact the availability of this transport has on suburban development;
- Select and use appropriate measuring instruments to measure the dimensions of school grounds and the position of buildings and draw a representative map to scale;
- measure and record measurements;
- use measuring equipment with precision and accuracy or within permitted tolerances;
- record temperature and rainfall over a period of time using a rain gauge and a wet / dry thermometer;
- make appropriate conversions between units of measurement;
- estimate the area of a landmass based on the comparison with other land masses;
- estimate the percentage of the area on the map that is natural environment and buildt environment;
- measurement and survey of the Earth's surface;
- measurement of distances;
- co-ordinate system for grid references on maps;
- bearings;

- reinforce students' knowledge, skills and understanding in aspects of measurement (including estimation);

- planning trips using railway, bus and plane timetables;

- investigating and studying time zones, day and night, seasons – because the earth is a sphere moving around the sun.

Data Sense, Handling and Interpretation:

- Weather recording;

- collecting data by counting, measuring and surveys;

- sorting, ordering and classifying data collections – making choices about selection of criteria;

- use of numerical data when making geographical descriptions and comparisons, e.g. comparing populations or areas;

- critically interpret statistical information, tables and graphs;

- represent relevant and purposeful information in graphical and table form and interpret to answer questions;

- present as part of an investigative project, appropriate tables and data, e.g. to depict rainfall statistics, hours of sunshine etc.;

- present and display information collected in an investigated project using a pie chart, line graph, bar chart etc.;

- create rainfall or temperature graphs and gain insights and meaning from what they indicate;

- compare rainfall of cities in equivalent northern and southern latitudes;

- analyse data from statistic surveys and calculate the percentage of data in a given category, e.g. the percentage of households that use gas, wood, oil or electricity for heating;

- collect, record and present evidence, analyse and evaluate evidence and draw and justify conclusions;

- representing and plotting data (e.g. population growth/density proportion of world developed/undeveloped, land use et.);

- reading scales;

- use of spreadsheets;

- use of TV, newspaper, internet, e-mail to gather weather information – followed by observation and discussion;

- from discussion, photographs and internet, study and investigate why specific forms of transport are used;

- tabulating and graphing data;

- the trips to the local shop/supermarket – price comparisons, packaging patterns, food sources;

- collecting, recording presentation and interpretation of data from a geographic investigation;

- project idea: Carry out an enquiry into weather patterns and relationships using meteorological records.

In the area of Data Sense, Handling and Interpretation, teachers of Geography may also consider the following when deciding how work in Geography links with using and applying numeracy in Coláiste Bríde:

- Can we use the handling data cycle – state problem, identify and collect data, analyse and represent data, interpret results directly in relation to a geography topic? Are there opportunities for joint working with the maths department?
- Which parts of the handling data cycle – state problem, identify and collect data, analyse and represent data, interpret results – relate directly to work in geography? Are there opportunities for joint work with the mathematics department? Which units offer greatest potential for joint working? Would there be any ICT use in this work?

Number Sense and Computation:

- Use strategies, estimation and contextual knowledge to confirm calculations and answers are reasonable;
- investigating and problem solving in field studies;
- calculations and computation involving estimation, finding totals or averages;
- understanding, analysis and interpretation of a wide range of statistical evidence including secondary source data;
- timelines (geological);
- estimating area – measuring volcano size;
- discussing evidence in geography may involve measurement, estimation and approximation skills, and making inferences;
- reading timelines;
- comparisons of temperatures;
- use number sense and knowledge of number facts to determine the accuracy of calculations within reasonable limits;
- select and use simple and formulae to solve numerical problems;
- apply ratios to solve problems, e.g. use a given scale to draw a 1:10,000 scale map of the school;
- apply ratios to solve problems, e.g. estimate the proportion of rural land use to the build environment. What proportion of land use is devoted to primary industry? Suggest reasons for the proportions.
- using a grid map, estimate the area of land use in a selected are;

- understand and use equivalences between commonly used percentages, e.g. survey students on their country of origin. Describe this information as a percentage or fraction;
- read, write, compare and order positive and negative numbers, e.g.:
  - compare population movements between capital cities. Suggest reasons for these movements;
  - heights above and below sea level;
  - changes in temperature;
  - temperatures in sunlight and shade;
- discussing evidence in geography may involve measurement, estimation and approximation skills, and making inferences;
- the study of maps includes the use of co-ordinates and ideas of angle, direction, position, scale and ratio;
- the use and application of scale and ratio;
- comparisons of populations, land masses, birth rates etc.;

In the area of Number Sense and Computation, teachers of Geography may also consider the following when deciding how work in Geography links with using and applying numeracy in Coláiste Bríde:

- How are ideas related to scales and scale factors taught?
- Is it possible to adopt a consistent approach to problem-solving, investigations and enquiry-based approaches?
- Which elements of the number and calculation strands of numeracy feature in teaching geography?

Numeracy Language and Communication:

- Numeracy Keywords;
- key phrases in numeracy;
- key symbols of numeracy;
- using numerical vocabulary correctly and precisely;
- explaining and justify their methods and conclusions;
- discussing word problems;
- communicating the results of a statistical enquiry;
- discussion about and practice in using the language of logic and reasoning;
- cause and effect;
- comparing by size, weight etc.;

- study the similarity and differences of rocks and soils – sorting and grouping using different criteria;
- hypothesis testing:
    - Example Hypotheses:
        - Housing density decreases as distance from the town centre increases;
        - quality of housing increases as distance from the town centre increases;
        - quality of the environment improves as distance from the town centre increases;
        - area, ratio of areas;
        - basic calculation;
        - compound measure;
        - scale;
        - statistical measures;
        - statistical diagrams;
        - variation.

In the area of Numeracy Language and Communication, teachers of Geography may also consider the following when deciding how work in Geography links with using and applying numeracy in Coláiste Bríde:

- Is a common vocabulary in space, shape and measure used?
- How can consistency in students' interpretation and analysis skills be developed?
- In what ways could work on thinking skills in geography contribute to the development of using and applying mathematics?

Physical Education

<u>Representation and Spatial and Geometric Sense:</u>

- Sequences and pattern of movement;
- investigating patterns in dance;
- creating fluent sequences of movement in gymnastics, using the vocabulary of position, direction, shape and movements;
- devise and perform sequence of movements;
- draw shapes on the ground for the dancers while devising dances;
- triangle dances;
- videos taken of the movements and actions to help the students to develop their ideas on dance;
- treasure hunt – food;
- for orienteering identify the best route from A to B. Use contour lines to determine the easiest or most suitable route. Determine the gradient from A to B and whether the gradient is going up or down;
- plotting readability data;
- plotting ages of the novel's character;
- explaining and justify their methods and conclusions;
- interpreting and discussing results;
- symmetry in dance and balance;
- demonstrate number patterns by movement of people;
- plot the records of one sport against time on a graph. Can you use the graph to make a prediction?
- plot men's and women's results on the same graph;
- orienteering.

<u>Measures and Measurement</u>

- Measurement of heights;
- select and use appropriate measuring instruments;
- measure and record measurements
- construct a daily-activities chart showing sleep, work, eating etc. and determine when to take 20 minutes of exercise per day. Graph this information;
- select and use appropriate measuring instruments;

- measure and record measurement;

- demonstrate the correct use of a stopwatch and height gauge;

- use measuring equipment with precision and accuracy;

- make appropriate conversions between units of measurement;

- estimate the best angle to launch a shot put or discuss;

- estimate the area of the school basketball courts;

- using units of measurement: 100ths of seconds etc.;

- using metric measurements and making conversions;

- using measurement of distances and times;

- organise fitness programmes;

- use the following are measuring instruments;

  - weighing scales (body mass)
  - a stopwatch (time to undertake activity)
  - tape measure (height, vertical jump, long jump, arm span).

Data Sense, Handling und Interpretation

- Using data to make comparisons, e.g. scoring averages;

- graph fitness test results across different fitness components and present these findings in percentage format;

- survey class re sports played/watched. Present a graph;

- collection of real data for processing in numeracy, e.g. look at Olympic records;

- project: Collect and analyse simple data about their own and others' performances, e.g. the number of shots they have on target in a game, the number of times they hit the ball into one area of the field, the number of times they play a backhand shot.

In the areas of data sense, handling and interpretation, teachers of Physical Education may also consider the following when deciding how work in Physical Education links with using and applying numeracy in Coláiste Bríde:

- In what ways do pupils gather and use performance data, e.g.;

  - in general fitness work?

- Are there any links (e.g. in gymnastics or dance) building upon ideas of pattern, movement and symmetry developed in numeracy?

- How does the teaching of physical activities develop pupil' awareness of time, distance and speed? At what stage are rates such as km per house discussed? Is this compatible with the expectations in mathematics?

- How are map references, compass bearing sand estimates of distances travelled developed in planning and carrying out outdoor activities? Are these in line with the mathematics yearly teaching programmes?

- In what ways do pupils gather and use performance data:
    - In general fitness work?
    - In specialised work such as athletic activities?

- How does this work support the handling data strand of numeracy? How can mathematics be used to support pupils' interpretations of performance data?

- How are differences in readings from manual and electronic data-logging equipment discussed? Is reference made to statistical terms such as the mean, mode and median that might be appropriate for measuring performance in a range of physical activities?

- How do pupils use problem-solving, communication and reasoning in physical activities?

Number Sense and Computation

- Athletic activities use measurement of height, distance and time, and data-logging devices to quantify, explore, and improve performance. Ideas of counting, time, symmetry, movement, position and direction are used extensively in music, dance, gymnastics, athletics and competitive games;

- calculations of speed of athletic performance;

- planning a sports day – costing, timing, organisation;

- planning a sports event – measurement, time, number work;

- record-keeping of personal achievements in athletics over a term to identify improvement in performances – data handling and timing, measuring time and distance, estimation;

- recording of results and times at a sports day;

- orienteering – space in shape;

- outdoor activity with maps, scales, symbols – space and shape, movement;

- using the bleep test to assess fitness levels and recovery levels;

- keep fit project – such as skipping, with recording of times, total skips etc. – link with national Keep Fit Projects for heart health awareness;

- use strategies, estimation and contextual knowledge to confirm calculations and answers are reasonable;

- use number sense and knowledge of number facts to determine the accuracy of calculations within reasonable limits;

- select and use simple formulae to solve numerical problems;
- calculate the percentage of success shots on goal;
- calculate the fat content of commonly eaten foods using a calorie counter or fat/fibre guide;
- use numbers sense, appropriate strategies, computational skills and key information to solve numeracy problems, e.g. use food tables to calculate the nutritive content of a recipe or food item;
- apply ratios to solve problems, i.e. use ratios or proportion to break down information available within text, e.g.

  - calculate the ratio of newspaper space devoted to a men's and women's sport. Get the students to measure the newspaper area to the nearest square centimetre. Discuss and identify a more equitable solution to the present ratios;
  - fitness – work to rest ratios;

- calculate how many calories are used and expended in various activities;
- understand and use equivalences between commonly used percentages, e.g. design a sports day brochure with 25% of the area dedicated to advertisements;
- using/reading stop watches.

Numeracy Language and Communication:

- Numeracy keywords;
- key phrases in numeracy;
- key symbols of numeracy;
- using numerical vocabulary correctly and precisely;
- explaining and justifying their methods and conclusions;
- discussing word problems;
- use spatial language to describe movements in dance;
- move in response to mathematical spatial language.

In the areas of numeracy language and communication, teachers of Physical Education may also consider the following when deciding how work in Physical Education links with using and applying numeracy in Coláiste Bríde:

- How does the teaching of physical activities develop pupils' awareness of time, distance and speed? Do we discuss compound measures such as km/hr?
- How are differences in readings from manual and electronic data-logging equipment discussed?

Home Economics

Measures and Measurement:

- Weighing and reading a variety of scales including decimals on electronic scales;

- adapting recipes for different numbers of people using ratio and proportion;

- produce a timeline of organisational steps necessary to produce a recipe or meal;

- select and use appropriate measuring instruments;

- measure and record measurements;

- demonstrate the correct use of the thermometer and weighing scales;

- use the following as measuring instruments;

    - weighing scales (for ingredients);

    - an oven timer (to monitor cooking or baking time);

    - an egg timer (to monitor the time taken to boil an egg);

    - graduated container (food measures);

- use measuring equipment with precision and accuracy;

- make appropriate conversions between units of measurement;

- estimate the quantities required to cook a recipe, e.g. estimate 100 grams of butter by cutting up a 500 gram block into fifths;

- the preparation of food involves measurement, working out times and calculating cost, frequently extending into calculations involving ratio and proportion;

- reading and using scales;

- metric and imperial conversions;

- cooking and baking times;

- find the different measuring systems used in different recipe books;

- examine how/if different measuring systems relate to each other;

- look at oven dials. What are different systems for measuring how hot the oven is? How do they relate to each other?

- look at diet related statistics and their use in weight control;

- planning and cooking a meal, e.g. use of weighing scales to weigh ingredients, cooking times, costing, number of courses, etc.);

- convert from imperial to metric in order to follow a recipe, e.g.

    - 1 cup   =   250 millilitres

    - 1 teaspoon   =   5 millilitres

    - 1 tablespoon   =   20 millilitres

Data Sense, Handling and Interpretation:

- Use a graph to illustrate carbohydrate, sugar and fibre content in a range of breads;
- Designing a survey to determine adolescent breakfast eating habits. Collect information from a variety of students, collate and interpret the results and plan action to modify these habits in your school;
- Plan and design appropriate survey questions, e.g. how much money do girls and boys spend in the canteen each week and on what items?

Number Sense and Computation:

- Use strategies and contextual knowledge to confirm calculations and answers are reasonable;
- food orders / costing;
- use number sense and knowledge of number facts to determine the accuracy of calculations within reasonable limits;
- use a relevant formula to calculate the percentage of body fat from fat-calliper measures at selected body positions;
- calculate BMI using height and weight measures;
- use the food pyramid to analyse daily food intake;
- determine the content of protein, fat and carbohydrates in a range of sample foods;
- select and use simple and formulae to solve numerical problems;
- calculate the fat content of commonly eaten foods using a calorie counter or fat'fibre guide;
- interpret the percentage of nutrients on food nutrition labels;
- use numbers sense, appropriate strategies, computational skills and key information to solve numeracy problems, e.g. use food tables to calculate the nutritive content of a recipe or food item;
- apply ratios to solve problems, i.e. use ratios or proportion to break down information available within text, e.g. calculated the ratio of newspaper space devoted to a men's and women's health. Get the students to measure the newspaper area to the nearest square centimetre. Discuss and identify a more equitable solution to the present ratios;
- apply ratios to solve problems, e.g. be able to use recipe ratios – apple crumble topping: flour, sugar, butter in the ratio of 3:2:1;
- apply ratios to solve problems, e.g. plan a class meal, recipe quantities as appropriate – meal for our to a meal for twenty;
- understand and use equivalences between commonly used percentages, e.g.
  - reduce a recipe by half (50%)
  - garment alterations;

- recipes as a ratio application and context;

- baking times;

- sizes of garments and shoes;

- estimation;

- use of calculator;

- read, write, compare and order positive and negative numbers, e.g.

  - measure ingredients using scales

  - measure the temperature of the fridge and freezer and understand why food is stored in freezers at -18ºCelcius.

Numeracy Language and Communication:

- Numeracy keywords;

- key phrases in numeracy;

- key symbols of numeracy;

- using numerical vocabulary correctly and precisely;

- explaining and justifying their methods and conclusions;

- discussing word problems;

- communicating the results of a statistical enquiry;

- discussion about and practice in using the language of logic and reasoning;

- cause and effect;

- comparing by size, weight, etc.;

- sequencing.

English

Representation:

- Using a graph to track the state of Macbeth's temper during the play (using "time" on the horizontal axis and "measure of temper" on the vertical axis;
- drawing stage plans for short drama pieces;
- fiction writing – draw map of imaginary island as setting for story;
- instructional/procedural writing, e.g. write directions to and from the school canteen (from students' classroom);
- using a line graph to track the plot in a novel;
- interpretation of graphs and charts from the media;
- Investigating the link between poetry and numeracy.

Measures and Measurement:

- Organise and undertake a timed debate;
- determine the appropriate camera angles when creating visual texts;
- represent relevant and purposeful information in graphical and table form and interpret to answer questions;
- dimensions of pages;
- areas of margins;
- average number of words per page;
- measurement of sketches and graphics.

Data Sense, Handling and Interpretation:

- Using data, its representation and analysis in a piece of persuasive writing;
- surveying and analysis of opinion on reading habits or preferences of books, e.g. percentage of students who liked sci-fi, crime, comedy etc.;
- analyse everyday text (e.g. newspaper articles) to find examples of how data can be used to highlight an issue or to support and argument;
- from experience and from everyday examples, explain how statistics can be misleading;
- use different types of data representation to support an argument and to create desired effect, e.g. graphs, pie charts, frequency distribution tables, line graphs, pictograms, shading, minimum value, maximum value;

- represent relevant and purposeful information in graphical and table form and interpret to answer questions;

- conduct a survey of students to evaluate the relevance/enjoyment of a drama performance of another school. Use this evaluation as a review for a future performance;

- graphically represent the targeted audience for advertisements on television programmes, over the time period between 4p.m. and 10p.m.;

- plan and design appropriate survey questions, e.g. how much money do girls and boys spend in the canteen each week and on what items?

- Read a magazine survey (in which data is presented in percentage form of which illustrates young people's opinion on particular topics of interest. Discuss and compare views in class;

- Comparison of data sets on word and sentence length from different newspapers;

- Comparison of 2 data sets on word and sentence length;

- survey class re sports played/watched. Present a graph;

- survey class re cultural background. Present a graph;

- analysing newspaper articles with statistical information.

Number Sense and Computation:

- Strategies to cope with and decode word problems;
- writing in a variety of numerical and mathematical genres;

  - planning and recording numerical and mathematical investigations;
  - predicting numerical outcomes;
  - recounting numerical work of various kinds;
  - itemising instructions for carrying out different types of numerical work;
  - making records of numerical activities;
  - writing reports, explanations and details of observations;
  - making label which have to be accurate;
  - writing heading s that provide the required information for others;
  - offering numerical and mathematical proof;

- calculate the newspaper advertisement costs based on the page area and cost per square centimetre of adventising space for that particular page type, e.g. front page;

- read a magazine survey (in which data is presented in percentage form) which illustrates young people's opinions on particular topics of interest. Discuss and compare views in class;

- use numbers sense, appropriate strategies, computational skills and key information to solve numeracy problems. Calculate the ticket prices for a stage production based on making a particular profit. Calculate the cost of material s for the production;

- use numbers sense, appropriate strategies, computational skills and key information to solve numeracy problems, e.g. use supermarket brochures to select purchases up to a predetermined amount. List the purchases and compute the change they would receive;

- apply ratios to solve problems, i.e. use ratios or proportion to break down information available within text, e.g. analyse a newspaper tet to determine what part is devoted to advertising, main story, banner headlines, etc.;

- understand and use equivalences between commonly used percentages, e.g. convert the percentage of readership or a viewing patterns to fractions, where appropriate;

- understand and use equivalences between commonly used percentages, e.g. design a newspaper page with 25% of the area dedicated to the advertisements;

- rhythm in poetry;

- frequency of vocabulary;

- using or making a time-line of events in the book;

- time-lines of famous writers;

- readability formulae;

- number of pages in a novel;

- dates or original publication and second editions etc.;

- age of the novel's characters;

- time-lines of events in the novel;

- ordering and ranking: e.g. placing in ordinal arrangement;

- surveys.

Numeracy Language and Communication:

- Spelling of key numerical vocabulary;

- reading of non-fiction in which charts and tables have to be interpreted;

- comparing the language used in various texts, e.g. analysing word lengths in novels, broadsheet-newspapers, tabloid-newspapers, magazines, etc.;

- numeracy keywords;

- key phrases in numeracy;

- using numerical vocabulary correctly and precisely;

- explaining and justifying their methods and conclusions;

- discussing word problems;

- communicating the results of a statistical enquiry;

- discussion about and practice in using the language of logic and reasoning;

- cause and effect;

- comparing by size, weight etc.;

- sequencing;

- the following are all important aspects of helping pupils with the technical vocabulary of numeracy:

  - use of Word Walls;

  - Visual Verbal Squares;

  - using a variety of words that have the same meaning, e.g. add, plus, sum;

  - encouraging pupils to be less dependent on simple words, e.g. exposing them to the word multiply as a replacement for times;

  - discussion about words that have different meanings in mathematics from everyday life, e.g. take away, volume, product etc.;

In the areas of numeracy language and communication, teachers of English may also consider the following when deciding how work in English links with using and applying numeracy in Coláiste Bríde:

- What knowledge, skills and techniques

  - at word level

  - at sentence level

  - at text level

  can be developed in English lessons that will help pupils to

  - use mathematical vocabulary correctly?

  - explain and justify their methods and conclusions?

  - interpret and discuss results?

  - solve word problems?

  - communicate orally and on paper the results of a statistical enquiry or other in-depth piece of mathematics?

Modern Languages and Irish

Representation and Spatial and Geometric Sense:

- Use a page from a street directory to map a route from the school to a chosen location. Then give directions orally in the target language to another student who must determine the destination;
- create a floor plan of the pupil's "dream house," keeping rooms approximately to scale and use the target language to label the rooms;
- use of basic graphs and surveys to practise foreign language vocabulary and reinforce interpretation of data.

Measures and Measurement:

- Complete a timetable for the coming week using the 24-hour clock, using the appropriate keywords in the targeted language;
- telling the time in another language;
- investigating number systems in another language;
- counting in another language;
- measures and measurement;
- investigating distances between towns in the country where the foreign language is spoken.

Data Sense, Handling and Interpretation:

- Data collection to make comparisons;
- surveys;
- study a text above the pastimes of people in the target culture. Display information gained from the text in graphic and table format. Interpret the information to answer specific questions;
- read a magazine survey from the targeted culture (in which data is presented in percentage form), which illustrates young people's opinions on particular topics of interest. Discuss and compare views in class;
- compare numerical data about prices, local temperatures, distances in the target language;
- carry out and present the results of a survey in the target language.

Number Sense and Computation:

- Use conversion formulae to convert euros into the currency of the target culture;

- planning holidays;

- use and interpretation of transport timetables;

- currency conversions;

- shopping;

- use of percentages to calculate and solve problems;

- calculate the cost of articles of clothing during a 20% off sale. The pupils have the opportunity to use the language of clothing and shopping in the target language;

- use numbers sense, appropriate strategies, computational skills and key information to solve numeracy problems, e.g. use supermarket brochures from the target culture to select purchases up to a predetermined amount in the local currency. List the purchases and compute the change they would receive;

- apply ratios to solve problems, i.e. use ratios or proportion to break down information available within text, e.g. use ratios or proportion to break down information available within text, e.g. analyse a newspaper text from the target culture to determine what part is devoted to advertising, main story, banner headlines etc.;

- apply ratios to solve problems, e.g. plan a class meal in the target language, adjusting recipe quantities as appropriate – meal for four to a meal for twenty;

- read, write, compare and order positive and negative numbers, e.g.: Gather data on temperature from the target country and compare to Ireland's range of temperatures;

- dates, sequences and counting in other languages;

- currencies and currency transactions;

- could we support the teaching of place value by exploring the language patterns in counting numbers?

- % of people who spend holidays in target country;

- % type of transport they use/accommodation used;

- using conversion tables, e.g. converting euros to sterling or US dollars;

- creating a classroom shop with goods priced in the currency of the country;

- investigating cafe menus with prices;

- multiplication cavers spoken in the MFL;

- currency and distance conversion tables;

- travel data – distances, time, costs;

- travel brochures.

Numeracy Language and Communication:

- Numeracy keywords;

- key phrases in numeracy;

- key symbols of numeracy;

- using numerical vocabulary correctly and precisely;

- explaining and justifying their methods and conclusions;

- discussing word problems;

- foreign keywords for number, counting, measurement units, time, etc.;

- dates, sequences and counting in other languages; use of basic graphs and surveys to practise foreign language vocabulary and reinforce interpretation of data.

In the areas of numeracy language and communication, teachers of modern languages and Irish may also consider the following when deciding how work in modern languages and Irish links with using and applying numeracy in Coláiste Bríde:

- What knowledge, skills and techniques

  - at word level
  - at sentence level
  - at text level

  can be developed in language lessons that will help pupils to

  - use mathematical vocabulary correctly?
  - explain and justify their methods and conclusions?
  - interpret and discuss results?
  - solve word problems?
  - communicate orally and on paper the results of a statistical enquiry or other in-depth piece of mathematics?

- To what extent is the development of words involved in reasoning and proof supported, e.g. 'if...then...,' 'therefore,' 'it follows that...,' etc.;

- How can the teaching of pupils, including EAL pupils be supported, to understand and use, read and write and spell correctly the mathematics vocabulary. Are there particular words in the vocabulary checklist that could be stressed?

- To what extent does the work on interpreting information/being a critical reader contribute to the development of mathematics, e.g. handling data presented in charts, graphs and diagrams?

- How might the skills developed in language lessons enhance pupils' capacities to solve problems, to reason and justify, and to evaluate their work in mathematics?

Mathematics

Representation and Spatial and Geometric Sense:

- Use a long tape measure or trundle wheel to measure relative distances;
- design a tour map of the east end of Dublin using grid references. Determine the optimum delivery route for a delivery person in terms of time and distance;
- design drink containers given certain parameters, e.g. a capacity of 1 litre, keeping materials costs as low as possible, practical for packing and use;
- use and describe transformations, e.g. enlargement, reduction or rotation;
- designing containers – how much do they need to contain – how do they sit on a shelf?
- houses – how much floor space – cost?
- 3D shapes – garden pavers etc.;
- cost to renovate a bedroom.

Measures and Measurement:

- Complete a timetable for the coming week using the 24-hour clock, using the appropriate keywords;
- calculate the length of flights between airports in Ireland. Make use of both 24 and 12 hour clocks;
- plan a trip giving arrival and departure dates and total time taken for each leg of the journey;
- read a bus or train timetable and establish appropriate routes of travel to get from A to B in the shortest time;
- select and use appropriate measuring instruments and units;
- measure and record measurements;
- make appropriate conversions between units of measurement;
- estimate the distance for a trip around Ireland and the amount of petrol needed;
- estimate the cost and materials required to paint and carpet a house.

Data Sense, Handling and Interpretation:

- Critically interpret statistical information, tables and graphs;
- represent relevant and purposeful information in graphical and table form and interpret to answer questions;
- present and display information collected in an investigated project using a pie chart, line graph, bar chart etc.;

- understand which type of data representation is applicable in a specific instance or context;
- pie charts/histograms/bar charts/line graphs/scattergrams;
- problems involving speed/time.

Number Sense and Computation:

- Use strategies, estimation and contextual knowledge to confirm calculations and answers are reasonable;
- use number sense and knowledge of number facts to determine the accuracy of calculations within reasonable limits;
- calculate the cost to paint a house based on the amount of paint used per square metre;
- select and use simple and formulae to solve numerical problems;
- use percentages to calculate and solve problems;
- use numbers sense, appropriate strategies, computational skills and key information to solve numeracy problems, e.g. solve problems involving discounts, VAT, profit and loss;
- provide opportunities for students to explain their mental processes and talk through both correct and incorrect answers;
- find ways of helping students to make connection between conceptual aspects of mathematics and methods of calculation;
- treat calculations as problems, which require interpretation in a meaningful way rather than encouraging students simply to spot the appropriate method to use;
- use realistic contexts in which to apply problems;
- estimation questions;
- working out values for graphing, given x coordinate;
- apply ratios and proportion to solve problems, e.g.
  - slope;
  - sharing a lottery prize;
  - mixing concrete;
  - recipes;
  - making chemicals;
  - similar triangles;
  - read, write, compare and order positive and negative numbers, e.g. using number lines to order numbers in a variety of forms or comparing wins and losses for a sports team;

Numeracy Language and Communication:

- Numeracy keywords;

- key phrases in numeracy;

- key symbols of numeracy;

- using numerical vocabulary correctly and precisely;

- explaining and justifying their methods and conclusions;

- discussing word problems.

History

Representation and Spatial and Geometric Sense:

- Pupils will make statistical enquiries, e.g. in analysing population data to explore and compare lifestyles;
- students will also use a wide range of measurements and rates of change;
- the study of maps includes the use of co-ordinates and ideas of angles, direction, position, scale and ratio;
- establishing chronological order and sequence by using a time line;
- relationship between units of time;
- investigating mosaic patterns in historical buildings;
- creating the model of a WW2 aeroplane.

In the areas of representation and spatial and geometric sense, teachers of history may also consider the following when deciding how work in history links with using and applying numeracy in Coláiste Bríde:

- How are graphs and charts used in history?
- Can we adopt a consistent approach to problem solving, investigations and enquiry-based approaches?
- How are graphs and charts used in history? Does their development support the progression outlined in the yearly teaching programmes for mathematics? Do our labelling conventions for graphs match those of the mathematics department?

Data Sense, Handling and Interpretation:

- Tabulating and graphing data, e.g. populations of ancient cities, casualties in battles and wars etc.;
- compare population statistics for a particular location today with 100 years ago;
- use the handling data cycle – state problem, identify and collect data, analyse and represent data, interpret results – directly in relation to a history topic;
- create opportunities for joint work with the maths department, e.g. using data on passengers of the Titanic (could also be linked to the English dept. for creative writing), using data from census returns for a local town or village from 100 years ago compared with the present day;

- handling the data cycle – state problem, identify and collect data, analyse and represent data, interpret results – relate directly to work in history, explore the opportunities for joint work with the mathematics department and for ICT use;
- fatalities in war;
- interpreting frequency tables;
- interpreting pie charts of data.

Number Sense and Computation:

- Discussing evidence in history may involve measurement, estimation and approximation skills and making inferences;
- timelines and sequencing of historical events and characters;
- chronology using a timeline;
- estimation of the duration of an ancient war;
- analysing historical evidence numerically where appropriate, e.g. by finding averages of the number of death in different regions during the Black Death;
- dates of events;
- investigate the range and type of diseases prevalent during a particular period, the rate of spread, mortality rates, impact on different ages;
- number of fatalities in various wars, battles, events etc.;
- working out the length of the reign of a monarch;
- investigating Roman currency.

Numeracy Language and Communication:

- History of maths, ancient civilisations, knowledge of maths and astronomy and their use in ancient architecture;
- discussing evidence in history may involve measurement, estimation and approximation skills, and making inferences;
- cause and effect;
- analysing parallel events in history;
- investigating a Roman market;
- vocabulary associated with the passing of time;
- identify, select and use a range of appropriate sources of information, evaluate the sources used, select and record information relevant to the enquiry and reach conclusions;
- Morse code, Enigma etc.;
- numeracy keywords;
- key phrases in numeracy;

- key symbols of numeracy;

- using numerical vocabulary correctly and precisely;

- explaining and justifying their methods and conclusions;

- census databases;

- discussing word problems;

- communicating the results of a statistical enquiry;

- discussion about and practise in using the language of logic and reasoning;

- cause and effect;

- comparing by size, weight etc.;

- studying and documenting the life and work of Florence Nightingale;

- studying and investigating the work of mathematicians such as Pascal, Fibonacci and Euler;

- studying and investigating Roman civilisation – number systems, tiling patterns, army organisation, distances on Hadrian's Wall;

- studying and investigating historical buildings – symmetry in design, plans and records of the buildings;

- studying and investigating Egypt – pyramids, number systems, measuring system;

- study of church yards and parish records – dates of birth, dates of death, longevity, family trees;

- study and investigation of historical voyages of discovery;

- the development of units of measure began with the Magna Carta (1215).

In the areas of numeracy language and communication, teachers of history may also consider the following when deciding how work in history links with using and applying numeracy in Coláiste Bríde:

- Is a common vocabulary in space, shape and measure used?

- How can consistent pupils' interpretation and analysis skills be developed?

- In what ways could work on thinking skills in history contribute to the development of using and applying numeracy?

C.S.P.E.

Measures and Measurements:

- Given a quantity of waste produced in one household in one day, calculate the total waste from a large number of households in one year (making conversions as appropriate).

Data Sense, Handling and Interpretation:

- Construct simple surveys from community members on experiences at school, e.g. uniform, subjects taught etc. Create and use the information to make comparisons between schooling over the years;
- analyse data from statistic surveys and calculate the percentage of data in a given category, e.g. the percentage of households that use gas, wood, oil or electricity for heating;
- exploring and investigating bias and exaggeration within statistical information;
- research a topical political, spiritual, moral, social or cultural issue, problem or event by analysing information from different sources, including ICT-based sources, showing an awareness of the use and abuse of statistics;
- research into the design, make and market process collecting data from market research;
- analysing newspaper articles with the statistical information;
- projects: Investigate smoking patterns in different age groups within Ireland. How widely available are fair-trade goods in local shops? Explore voting patterns in general elections. Compare the turnout in elections in different countries;
- the discussion of social issues is likely to lead to the use of primary and secondary data and the interpretation of graphs, charts and tables, helping pupils to make reasoned and informed decisions and to recognise biased data and misleading representations. By applying mathematics to problems set in financial and other real-life contexts, pupils will develop their financial capability and awareness of the applications of mathematics in the workplace.

In the areas of data sense, handling and interpretation, teachers of C.S.P.E. may also consider the following when deciding how work in C.S.P.E. links with using and applying numeracy in Coláiste Bríde:

- How much work involves handling and interpreting data as a means of enabling pupils to become better informed citizens? Can the handling data cycle be used – state the problem, identify and collect data, analyse and represent data, interpret results – directly in relation to any topic? Are there opportunities for joint working with the maths department?

- when discussing numbers, e.g. in populations, time differences, fractions, percentages and proportions, does teaching build upon the expectations set out in the number strand of the yearly teaching programmes for mathematics?

- how much work involves handling and interpreting data as a means of enabling pupils to become better informed citizens? Which elements of the handling data cycle – state problem, identify and collect data, analyse and represent data, interpret results – are used most? Do you use ICT in this work?

- does teaching employ a range of graphs and charts in line with expectations in the mathematics yearly teaching programmes?

- are there opportunities to make links with numerical work on maps, scales and distances? Compare the timing of such work with the objectives in the yearly teaching programmes for numeracy;

- are pupils introduced to numeracy from other cultures?

- is pupils' numerical knowledge and skills used when exploring the ideas of probability, risk and chance?

- is correct numeracy vocabulary used where appropriate?

- when exploring evidence, are pupils given opportunities to develop their competence in problem solving, communicating and reasoning?

Number Sense and Computation:

- Use numbers sense, appropriate strategies, computational skills and key information to solve numeracy problems, e.g. use the current ages of the students to calculate their age in a given year in the future;

- work experience investigations/numeracy in the work place;

- wages, VAT, tax, interest payments, mortgage types, market research;

- the most efficient way for students to evacuate the school building in an emergency.

Numeracy Language and Communication:

- Numeracy keywords;

- key phrases in numeracy;

- key symbols of numeracy;

- using numerical vocabulary correctly and precisely;

- explaining and justifying their methods and conclusions;

- discussing word problems.

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