Supporting a Whole-school Approach to

Numeracy

Tips for Teachers from Teachers
Promotion of Whole School Numeracy

Suggestions

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<tbody>
<tr>
<td>1</td>
<td>Display numeracy posters throughout the school</td>
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<td>2</td>
<td>Puzzle of the week</td>
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<td>3</td>
<td>Signs to office/classrooms should include distance</td>
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<td>4</td>
<td>Students’ numeracy work displayed in classrooms/corridors</td>
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<td>5</td>
<td>When returning students’ work give the mark as a fraction and ask them to convert it to a percentage</td>
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<td>6</td>
<td>As part of our Numeracy Policy the language of numbers is taught in every class</td>
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<tr>
<td>Have a whole school approach the Maths Eyes initiative</td>
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- Students are asked to find pictures in magazines/newspapers or take pictures related to a particular theme.
- A selection of the pictures is put up in each classroom on a chart with a heading. In this way, each classroom around the school has a chart with different pictures based on the same theme each month.
- It is interesting to see the difference between a sixth year student's interpretation and a first year's.
- Themes might include
  - Patterns (colours, tiles, number, lights etc.)
  - Space/shape (shadows, directions, maps)
  - Statistics (Premiership data, tables, censuses, graphs etc)
  - Geometry (railway tracks, buildings, goalposts, floors)
  - Percentages (shop windows, sales, inflation, bills)
  - Decimals (units of measure, length of wood, money)
  - Relationships (calories and food, running and fitness, distance, speed, time - Leaving Cert students could bring calculus into this one)
  - Fractions (time, a clock, fuel gauge, ingredients, a maze - directions given in fractions)
<table>
<thead>
<tr>
<th>8</th>
<th>Maths department to agree common approaches to teaching content and share these with other departments.</th>
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<tbody>
<tr>
<td>9</td>
<td>Member of maths department to attend meetings of other subject departments from time to time.</td>
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<td>10</td>
<td>Students asked to record where numeracy occurs in each subject over a period of a week/month.</td>
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<td>11</td>
<td>Maths board where notices, puzzles and cartoons can be posted.</td>
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<td>12</td>
<td>A number-line in every classroom.</td>
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<td>13</td>
<td>Maths notice-board in the staffroom where sequence of topics to be covered /numeracy keywords of the week/month etc. are posted.</td>
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<tr>
<td>14</td>
<td>A clock should be in every classroom.</td>
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<td>15</td>
<td>Get students to calculate the percentage of marks awarded to each question on the Junior Cert or Leaving Cert papers in your subject and create a visual representation of the same.</td>
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<tr>
<td>16</td>
<td>Stickers giving measurement of doors/windows/classroom in each room.</td>
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<tr>
<td>17</td>
<td>Glossary of maths term in each classroom.</td>
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<tr>
<td>18</td>
<td>Use an online maths dictionary in class.</td>
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<td>19</td>
<td>Bring in speakers to talk about how they use maths in their work.</td>
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<td></td>
<td>Parents invited in to first year maths class where students describe what they are doing.</td>
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</tbody>
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**Castlepollard Community College**

![Image of school hallway with signs]

- Home Ec. 9m 40cm
- Metalwork 17m 10cm
- Woodwork 19m 45cm
- T G Rooms 21m 90cm
Donahies Community School

Maths Projects,

Coláiste Mhuire Cabra

Maths Charts,

JCSP Student Posters

Student Created – Maths Charts
www.plusmaths.org
free to download
Our attendance clock with JCSP time poster

“Clock, Calendar, Class Timetables in every classroom“
Presentation Secondary School, Milltown, Killarney

Preparation and Organisation of Sports Day

Activities included:
- Marking out the field for all the different sports.
- Calibrating results into league tables.
- Tracking results and cross checking.

Orienteering with a Maths Twist

Orienteering helped the students with their Personal Development in areas such as:
- Planning Ahead.
- Problem Solving and Decision Making.
- Helping develop memory skills, concentration,
- self-confidence and self-esteem.
- To improve the oral language competency of children
and to promote a better attitude to maths.
Running the tuck shop

First Year students working in Tuck shop

- TY Tuck shop open at breaktimes.
- Numerical skills developed
- Mental arithmetics
- Addition, subtraction, division, multiplication

Social Development
- Self Confidence
- Interpersonal skills
- Maturity
- Peer teaching

Future Development
- Peer mentoring
- Business numeracy
- Cross curricular numeracy

Lunch Club

- A lunchtime club held weekly in the TY rooms.
- All first years welcome to attend.
- Supervised by TY's
- 6 Week duration

Issues
- Clashing with sports and other clubs. Very quiet on fine days.

- Countdown
- Darts
- Shopping with Argos
- Sudoku's
- Card games

Sports Day
- Held annually in the
Kylemore College, Ballyfermot

Books Read

Average Score
Minutes Reading per Day
St Dominic’s Ballyfermot

“Maths Eyes” Project

Transition Years – Primary Feeders – 4th – 5th - 6th - Parents – Local Photography Club

Introductory Hand Out for Participants

Data Handling and Chance
Patterns and Relationships

Pattern surrounds us in our daily lives e.g. road markings, window panes, rail, wall and floor coverings, ratio/fractions etc.

Problem Solving

In our everyday lives we constantly solve a range of problems. Problem solving is an important mathematical and everyday skill. The kinds of problems that can arise e.g.
Portlaoise Community College

Lotto

Rules:
1. Must be written in pen
2. Choose 4 numbers between 1 - 30
3. Must do a sum to get numbers (e.g. 3x3=9).
4. If the sum is wrong, the ticket is invalid
5. Must have ticket with them at the draw
6. Lotto held every month
Student Aid

Taped to desks in maths class and distributed to all teachers
Test given at the end of every chapter and to be recorded in this handbook. There will also be an October assessment, Christmas assessment, and a Summer assessment. If there is no written homework given, rework the classwork. Attempt ALL questions, especially in exams. Use the Traffic Lights system to show how you understand your Project Maths.
Maths Eyes Initiative

haveyougotmathseyes.com

“In 2011 a successful community initiative to develop the maths eyes of the community in Tallaght, Co. Dublin, Ireland took place. The initiative aimed to highlight to the community that they use mathematics everyday and build confidence in their own mathematics.”

More information is available by logging onto the website haveyougotmathseyes.com
Ardgillan Community College-Exam Cover Sheet

[Year Group] Year
End of Term Examination
May 2013

[SUBJECT]

[(Total marks available)]

Name: ______________________
Class: ______________________
Teacher: ____________________

GOOD LUCK!

Feedback

For examiner's use only

<table>
<thead>
<tr>
<th>Total</th>
<th>Fraction</th>
<th>Decimal</th>
<th>%</th>
<th>Grade</th>
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</thead>
</table>

WORDS
More Numeracy Strategies

- “In the resource ‘area’ the walls running alongside the corridor had visual maths problems (addition/multiplication etc) these were changed throughout the year and it was interesting to see the students quickly trying to work out the new problems.

- “The history dept. put up key dates, the geog. dept. put up distances, the home ec dept weights/ volumes etc. and these were very visual but numeracy rich”.

- “6th class texts available to first year teachers in Sept!”

- “I use dice games to teach and practice numbers as Gaeilge”.

- “Maths for Fun week where the maths teachers organised a range of games and competitions. Students had to find the largest, smallest, longest etc They had to find averages/percentages : number of rural/urban students, red haired etc (students came up with their own focus)"

- “I heard of a school who did a comparison of cars in schools through google maps

- we gave a group a digital camera and they had to find a variety shapes”
• “I used to do fractions, percentages and ratios from roll call.
   What fraction of the class is absent?
   What percentage of the class is present?
   Is more than 75% of the class present today?
   What is the ratio of boys to girls today?

• “Problem of the week with all first years. Think that the problem was put
  on the noticeboard on Monday and the answer/method was
  given/worked through on Friday.”

• “From now on in my school, no test should be marked out of 10 or 100.
  As an Irish teacher I could give a test and mark it out of say, 73. I will
  return the tests. Students must
  a. Estimate the grade and the
  b. calculate the % they got.
  c. All teachers of all subjects must do this in the junior cycle.”

• “When a student writes a history essay, they will calculate the area of
  the piece of writing as opposed to the length. “
Feedback from Numeracy Pilot Schools 2012

Planning

- Designated numeracy room whereby each maths class per week will have one of their classes timetabled for this room
- Each maths teacher liaises with 4 non-maths departments with regard to numeracy provision
- Extra teacher for first year maths to facilitate team teaching
- First Year students and Transition Year students were surveyed with regard to their attitudes towards maths.
- Numeracy class once a week for first years
- Numeracy class to discuss what is going on in maths class.
- Place mat exercise to explore numeracy moments with the whole staff.
- Review of strategy within the staff.
- School Improvement Team (literacy and numeracy combined)
- Two surveys- 1) September 2) May to check for improvement.
- Whole school numeracy policy

Whole school Strategies/Approaches

- A different teacher is designated every week to provide puzzles around the school
- Advanced maths class
- Apps for binary numbers
- Brain Teasing Books
- Bridging document primary-secondary
- Charts across the school
- Chess/darts
- Clock in every room
- Common approaches to deal with weak areas.
- Common calculator
- Common PowerPoint puzzle on the server every day.
- Create an awareness of the Project Maths strands.
- Dara O’ Briens ‘School of Hard Sums’
- Elections-tallies/opinion polls/percentages etc.
- Estimation/units
- Examples of numeracy in the different subjects
- Family Quiz
- Identify students’ weaknesses
• IKEA- measures and benchmarks
• Ipad app- maths bingo
• JCSP numeracy resources
• Lateral thinking problems to begin every class
• Mathematical Tables in various languages
• Maths class timetabled once a week to the computer room
• Maths dictionary
• Maths Olympiad
• Maths trail developed by TY students
• Metres/kilometres
• Midterm effort grade
• Monthly puzzle
• Multiple meaning dictionary
• Nets of solids in rooms
• No calculator in first year
• Number line app.
• Number line in every room
• Numeracy notice board
• Numeracy corner- Argos catalogue, scrabble, bingo
• Orienteering
• Paired maths 5-6 weeks training
• Parents’ Information Evening
• Posters around the school
• Prisms
• Problem boards
• Promote a positive attitude towards mathematics
• Property tax
• Pulse rates- resting/running/standing
• Puzzles emailed to parish newsletter
• Questions from other subject content tackled in maths class
• Review of strategy within the staff.
• School Improvement Team (literacy and numeracy combined)
• Signs on walls – 4m to the woodwork room etc.
• Sports (darts, archery and basketball)
• Steps on stairs labelled
• Students heights
• Table quizzes
• Target the same area of numeracy at the same time.
• Test scores in fraction format
• Traffic lights system
• TV Screen with test scores
• TY maths - display an exponential world
• TY mentoring - comment card for students using the clinic.
• Use of Census at Schools
• Use of mangahigh.com

Quotations

"Calculators can only calculate - they cannot do mathematics."

-- John A. Van de Walle

"We only think when confronted with a problem."

Ä John Dewey

"Failure is the opportunity to begin again, more intelligently."

Henry Ford

To learn, you must want to be taught."

-- Proverbs 12:1
"To infinity and beyond."
-- Buzz Lightyear

“Arithmetic is being able to count up to twenty without taking off your shoes."
Mickey Mouse

"Think! Think and wonder. Wonder and think. How much water can 55 elephants drink?"
-- Dr. Seuss

"Black holes are where God divided by zero."
-- Steven Wright

The only angle from which to approach a problem is the TRY-Angle
"Decimals have a point."

"Mathematics is not a spectator sport!"

-- Karl J. Smith

"There are three kinds of lies: lies, damned lies, and statistics."

-- Benjamin Disraeli

"Statistics: the Mathematical the of ignorance."

-- Morris Kline

"A math student's best friend is BOB (the Back Of the Book), but remember that BOB doesn't come to school on test days."

Baseball is 90% mental. The other half is physical."

-- Yogi Berra
"The mathematician's patterns, like the painter's or poet's, must be beautiful. The ideas, like the colours or the words, must fit together in a harmonious way. Beauty is the first test: there is no permanent place in the world for ugly mathematics."

- Godfrey Harold Hardy, Mathematician's Apology (1940)
Mathephobia

“Mathephobia: Some people believe that the early settlers brought the disease with them although the disease was not recognised as such. Many people are carriers but escape in the usual medical check-ups perhaps because it is not a listed disease. A mother or father may inadvertently pass it to their children by their negative attitude towards maths”

Professor M Sharma, (Framingham, Mass., USA)
### Numeracy – A Checklist

<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Yes</th>
<th>No</th>
<th>Priority</th>
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<tbody>
<tr>
<td>1</td>
<td>Data on maths ages / maths ability gathered, analysed and shared</td>
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<tr>
<td>2</td>
<td>Maths exam results - monitoring and analysing of school based &amp; state exam results</td>
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<td>3</td>
<td>Survey of teachers’ concerns &amp; opinions</td>
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<tr>
<td>4</td>
<td>Survey of students’ views</td>
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<tr>
<td>5</td>
<td>Appropriate numeracy goals identified</td>
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<tr>
<td>6</td>
<td>Numeracy targets set</td>
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<td>7</td>
<td>Staff meetings to discuss &amp; agree numeracy plans</td>
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<tr>
<td>8</td>
<td>Staff agree “Must – Could – Should”</td>
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<td>9</td>
<td>Numeracy action plan</td>
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<td>10</td>
<td>Numeracy committee</td>
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<td>11</td>
<td>Targets &amp; plans for SEN, EAL &amp; exceptionally able students</td>
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<td>12</td>
<td>Numeracy promotion part of subject department plans</td>
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<tr>
<td>13</td>
<td>Parents consulted and informed</td>
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<td>14</td>
<td>Appropriate &amp; varied supply of books, software &amp; hands- on materials</td>
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<tr>
<td></td>
<td>Description</td>
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<td>15</td>
<td>Time for numeracy / maths games (fun activities)</td>
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<td>16</td>
<td>Numeracy space developed (in the library)</td>
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<td>17</td>
<td>Numeracy interventions &amp; incentives</td>
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<td>18</td>
<td>Numeracy-rich environment throughout the school – diversity of languages – posters / slogans</td>
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<tr>
<td>19</td>
<td>Students’ work displayed</td>
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<td>20</td>
<td>Numeracy training for teachers</td>
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<td>21</td>
<td>Numeracy events – e.g. World Maths Day, taking students out to experience ‘real life’ numeracy, speakers from local businesses, etc</td>
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<td>22</td>
<td>Videos – demonstrating the use of maths in life on announcement screens</td>
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<td>23</td>
<td>Use of ICT to support numeracy development</td>
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<td>24</td>
<td>Teachers are numeracy role models – build &amp; promote positive language around maths</td>
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<td>25</td>
<td>Whole school approach to numeracy development</td>
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<td>26</td>
<td>Improvements in numeracy recorded &amp; analysed</td>
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<td>27</td>
<td>Key staff responsible for monitoring &amp; review</td>
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<td>28</td>
<td>Timeframe set for numeracy plan to be reviewed</td>
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<td>29</td>
<td>Review of plan</td>
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<td>Numeracy policy</td>
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<td>31</td>
<td>Implementing consistent marking policy</td>
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<td>32</td>
<td>Implementing consistent approaches to maths keywords, maths terminology, etc...</td>
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<td>33</td>
<td>Catering for the development of basic skills in numeracy</td>
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<td>34</td>
<td>Introducing a numeracy day / numeracy week in the school</td>
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<td>35</td>
<td>Providing feedback to staff by teachers who have attended in-service in numeracy</td>
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- Seeking involvement of parents
- Transition Year Programme to increase numbers taking Higher Level
- Sudoku / Maths Puzzles box in every class for free classes, time over, “numeracy now” minute
- Transition year coach first years as part of maths club
- Running a Tuck Shop for Numeracy Skills

**Numeracy Strategies**

- Using patterns / making connections
- Employing estimation strategies
- Trial and error strategies
<table>
<thead>
<tr>
<th>Using the calculator</th>
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<tbody>
<tr>
<td>Employing thematic approaches</td>
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<tr>
<td>Using a problem solving approach</td>
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<tr>
<td>Paired work / group work</td>
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<tr>
<td>Personal numeracy</td>
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<tr>
<td>Graphic organisers / flow charts / mind maps</td>
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<tr>
<td>Darts / maths games</td>
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<td>Sudoku puzzles in student areas &amp; prizes</td>
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<tr>
<td>Problems that promote solution curiosity – not just the right answer but how you ‘figured it out’</td>
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<td>Digital clock and old clock on corridors / in classrooms</td>
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<td>Calendars in classrooms</td>
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<td>Subject maths trails – demonstrating maths in each subject</td>
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**Links with home**

<table>
<thead>
<tr>
<th>Problem pages – Halloween, Christmas &amp; Easter</th>
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<tbody>
<tr>
<td>Meeting with parents (1ˢᵗ years and other years?) to promote positive attitude to numeracy</td>
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