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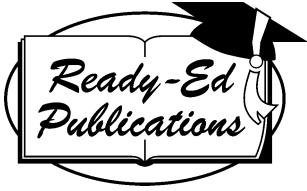
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Math Rescue Series

Book 2: Measurement, Chance and Data

**Activities for all students, including those
with Specific Learning Difficulties, working
at Challenging Level.**

Ages 11+

Focusing on the reinforcement of “the basics” in math, these activities can be used as either classroom consolidation or homework activity sheets.

Written by Sandy Tasker.

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Information on the Series

About The Books

This series has been created for classroom teachers and parents to use for home or class work – with students of a range of abilities taken into consideration. The focus will be on reinforcement of “the basics” in maths, as well as activities aimed at developing understanding of classroom activities in mathematics.

Students with Specific Learning Difficulties experience a range of problems with their academic learning. These aspects include:

- Difficulties with word recognition and comprehension
- Coping with pages that are too cluttered and with too many differing requirements
- Being able to sequence, recall and apply strategies in abstract situations
- Striving to process formation - while working to meet deadlines
- Having trouble with personal organization with their schoolwork.

The books in this series are designed with these problems in mind, and whilst pages are designed for the student with learning difficulties, they can also be used as a simple and straightforward introduction to concepts or a reinforcement of mathematical strategies for the whole class. The books will follow a basic format, with a variety of homework topics usually containing a choice of two worksheets.

Content of the Books

The Three Books in the Series

Book One: Number - Written Calculations

Book Two: Measurement, Chance and Data

Book Three: Number - Applications

Information in Specific Learning Difficulties

This section will contain information from a variety of referenced sources including online literature and recommendations from trained and experienced consultants. Information will include descriptions of the various learning difficulties and ideas for strategies in the classroom and at home.

A list of website addresses containing information and ideas is provided for teachers and parents.

Student Lifesavers

Many students with Specific Learning Difficulties become overwhelmed when expected to recall basic facts when carrying out more complex calculations. Students may grasp a concept, but be unable to apply the strategy because they are struggling to remember tables and combinations. To focus on the teaching point and alleviate stress for students, these tables and charts can be kept within easy access for the students. Charts include multiplication tables, addition and subtraction charts, number lines, rules and formulas and measurement conversions.

“Parent Power” Pages

The information provided on Specific Learning Difficulties at the beginning of this book can also be photocopied and given to parents who are requesting additional information. However, it should be made clear that this is a guide only, and contact with local recognized Specific Learning Difficulty associations or Child Development Centers should be made if there are any particular concerns.

Parent Power pages can be photocopied and sent home at the commencement of each unit and include:

- terminology;
- mathematical strategies and examples;
- learning and practice ideas in the home and community.

It is also suggested that teachers photocopy **answers** to each section and include these when sending home the Parent Power Page. This enables parents to feel confident in checking their child’s work and giving them valuable, immediate feedback.

Progress Charts

It is widely appreciated that success is built on success, and the more students are able to track their own progress, the more likely they are to be motivated to attempt the next stage in their learning. Students can keep these progress charts as an ongoing record of their homework.

Skill Drills

Some students work best with structured, timed drills. Drill practice can be very helpful in developing skills in automatic recall. The drill charts in this book are designed so that the length of time and the starting position for the drill can be changed according to the student’s abilities. A record of the score can be kept so that the student can track their progress.

Contents

Information on the Series	2
Specific Learning Difficulties	4
How are Individuals With Specific Learning Difficulties Affected?	5
General Strategies for the Home	8
Internet References	9
Parent Power	
Maths Words	10
Measurement	11
Time	13
Progress Chart	
What Can I Do?	16
Activity Sheets	
Measuring Perimeter 1	18
Measuring Perimeter 2	19
Area 1	20
Area Calculation 1	21
Area Calculation 2	22
Area of a Triangle 1	23
Area of a Triangle 2	24
Circumference 1	25
Circumference 2	26
Liters and Milliliters 1	27
Liters and Milliliters 2	28
Kilograms and Grams 1	29
Kilograms and Grams 2	30
Volume 1	31
Volume 2	32
What's the Time? Help Sheet	33
What's the Time? 1	34
What's the Time? 2	35
What's the Time? 3	36
What's the Time? 4	37
What's the Time? Estimates	38
Looking at Calendars 1	39
Looking at Calendars 2	40
Looking at Timetables 1	41
Looking at Timetables 2	42
Looking at Timetables 3	43
Range, Mode, Median and Mean 1	44
Range, Mode, Median and Mean 2	45
Bar Graphs and Line Graphs 1	46
Bar Graphs and Line Graphs 2	47
Venn Diagrams 1	48
Venn Diagrams 2	49
ANSWERS	50

Specific Learning Difficulties (SLDs)

What are Specific Learning Difficulties?

Specific Learning Difficulties **ARE**:

- A range of conditions including dyslexia, dyscalculia, dyspraxia and dysgraphia.
- Significant difficulties in one or a few areas of learning, whilst demonstrating average to above average abilities in most or all other areas.

Specific Learning Difficulties **ARE NOT**:

- A result of global low intelligence, physical conditions such as visual or hearing impairments, or a lack of appropriate parenting or teaching.
- Attention difficulties (or behavioural disorders) such as Attention Deficit Disorder (ADD) and Attention Deficit Hyperactivity Disorder (ADHD). Specific Learning Difficulties are founded on a reduced *capacity to learn*, and attention difficulties stem from a reduced capacity to *concentrate and attend* to tasks when learning.

Specific Learning Difficulties **CAN**:

- Appear to overlap, as learning areas often merge. For example, a person with reading difficulties may struggle in maths in the presence of lengthy word problems or poorly set-out activities (www.dyslexia-speld.com).

Descriptions of the Types of Specific Learning Difficulties

Dyslexia is the most commonly recognized and well-researched SLD, characterized by difficulties in:

- Recognizing, reading and spelling words;
- Comprehension of written information;
- Relating new written concepts to stored ideas and existing knowledge;
- *Phonological coding*, the process of associating sounds with letter groups;
- Producing written work (sequencing letters, recognizing letter reversals).

(www.dyslexia-speld.com)

Dyscalculia describes significant difficulties in the area of mathematics. People with dyscalculia may possess average to above average linguistic skills but struggle with:

- Mental recall of basic facts;
- Accurate calculation;
- Understanding and applying mathematical concepts, rules and formulas;
- Awareness of time, direction (such as spatial and mapping skills) and sequence;
- The ability to estimate and recognize errors in maths work;
- Money and budgeting;
- Games that involve strategic planning or complex scoring.

(www.dyscalculia.org)

Dysgraphia outlines difficulties with the production of written language which may occur in isolation or in conjunction with other SLDs. Underlying causes include difficulties with sequencing and ordering of letters and words, attention difficulties leading to poor fine motor and organizational skills and reduced auditory processing. (www.idonline.org)

Dyspraxia describes difficulties in the ability to plan and execute new or unfamiliar movements in a coordinated manner. During early childhood, many new tasks are being learned, so this is a time where dyspraxia can significantly impact upon daily living. Problems can appear with performing fine and gross motor tasks (Motor Dyspraxia) and / or speech-related tasks (Verbal or oral Dyspraxia). (www.dyspraxiafoundation.org.uk)

Associated Difficulties

Visual and Visual-Perceptual Difficulties (Source: www.children-special-needs.org)

These difficulties **may** occur in conjunction with, or as a result of, other learning or attention difficulties. The problems listed below can also place a considerable strain on the reading process for a child, and can often go unnoticed until the child is in primary school, where the he / she spends longer periods of time focusing on print.

Myopia (short-sightedness) - may lead to difficulties in reading information written on the blackboard or on charts around the classroom, if not rectified with glasses or contact lenses.

Binocular coordination - the action of both eyes moving together, a process required to read effectively.

Convergence - the movement of both eyes inwards, reaching an accurate point of focus.

Fixation - where the eyes meet on a specific point so that the image is clear.

Pursuit - smoothly tracking across an image or follow a moving object.

Saccades - a "jump" from one point of focus to another without losing place. This is particularly important as skilled reading involves a series of fixations on words across a line rather than one continuous movement.

- Children who have difficulty with any of the above may show signs such as skipping or re-reading lines, misreading small words, using their finger or moving their head as they read.

Directionality - A convention of the English language is that information is written from left to right. Some children confuse or reverse this direction and may also confuse letters that are the same shape in a different direction, such as d and b, or p and q.

Visual Figure-Ground is the ability to distinguish certain forms, words or features amongst irrelevant visual information such as reading print on a cluttered page, successfully scanning for key words within a block of text and editing work for errors.

Visual Discrimination relates to the distinction of similar words. Some children, for example, may consistently confuse similar words such as bad and bed, through and thorough.

Visual Form Constancy describes the recognition of the same object image or word in a different form, for example, being able to read the same sentence correctly in a variety of fonts, or understanding that a word is the same whether it is represented in capital or lower case letters.

Visual Closure can be demonstrated by mentally or physically completing “gaps” in visual images, such as writing the end of a word where only part of it is given or doing “dot-to-dot” and jigsaw puzzles.

Visual Memory aids in both reading and writing, as familiar words can be recognized, pronounced and spelt more automatically once they are retained. Students with poor visual memory take longer to learn new words.

Visual Sequential Memory refers to the recall of a sequence of shapes, images or words, and the ability to apply what is recalled. For example, looking up at the board to remember and write down a list of spelling words.

Visual Motor Integration is the process of integrating visual input with motor output – the coordination of “seeing, planning and doing”. In the classroom context, this skill is used in accurate copying of images and words, staying on the lines when writing and correctly aligning maths calculations, to name a few examples.

Auditory Processing

Auditory processing problems affect the learner’s ability to interpret auditory information. Often under the broad category of Central Auditory Processing Disorder (CAPD), this group of disorders are caused by a dysfunction of the brain, rather than of the ear, and include symptoms such as:

- A slower rate of processing auditory information due to a perceived distortion of the incoming sounds;
- A sensitivity to excessive noise or background noise – inability to concentrate and distractibility;
- Difficulty locating directionality of sound;
- Confusion of similar words or sounds;
- Poor memory of verbal instructions;
- Difficulty interpreting intonation such as jokes, sarcasm, questions, etc.;
- Apparent hearing loss, e.g. saying “What?” often despite normal results on hearing tests;
- Poor reading and/or writing as a result of some of the above problems.

There are several subgroups, which more specifically describe auditory processing disorders and like visual perceptual problems, these can exist in conjunction with other learning or attention difficulties.

Attention Deficit Disorder

Attention Deficit Disorder or ADD is a neurological disorder that has been a focus of media attention over the last decade. There are two types that are commonly recognized:

Attention Deficit Hyperactivity Disorder (ADHD) is characterized by:

- Constant fidgeting or moving about in a seat;
- Having trouble waiting a turn;
- Impulsivity;
- Difficulty listening to and following instructions.

Attention Deficit Disorder (ADD) is evident in individuals who:

- Are quiet, withdrawn and sluggish;
- Demonstrate low self-esteem;
- Are often described as “daydreamers”;
- Need constant prompting to remain on task.

Both types tend to be:

- Easily distracted
- Forgetful
- Disorganized

As previously mentioned, Attention Deficit Disorder is a separate entity to Specific Learning Difficulties and each requires some unique strategies to best approach the difficulties. There are, however, instances where an individual may experience *both* conditions to a certain degree.

Initially, it may be difficult for the untrained individual to pinpoint the “cause”. A student with attention difficulties may appear dyslexic because their distractibility leads them to constantly lose their place when reading. Conversely, a student with a specific learning difficulty may become so frustrated that they avoid work or give up easily, appearing to “lose concentration”.

Source: <http://add.about.com>

How are Individuals With Specific Learning Difficulties Affected?

Some of the obstacles that students with SLDs can face are:

- Being branded as “lazy” because they are capable in most areas, and their difficulties often do not correspond with expectations based on their intelligence;
- Becoming frustrated that they understand a concept, but are not able to read or write about it;
- Developing a low self-esteem as they struggle to keep up with their peers;
- Missing out on educational support and resources during the time it takes to identify their problems.

On the positive side, having a SLD can also mean that the individual:

- Is constantly seeking out alternative ways of thinking and learning, thus becoming a creative and innovative thinker or a strong leader;
- Is an intelligent, capable individual, who can be educated at any level if approached with understanding and a willingness to provide appropriate learning opportunities and strategies;
- Can overcome learning difficulties to become successful in their chosen fields. Some examples of these people can be found at: www.nald.ca and www.dyslexiaonline.com

General Strategies for the Classroom

Below are some ideas that may be of assistance with any of the areas of difficulty listed above. They are not intended to be specific strategies for any one area. These suggestions are provided as a guide only and it is recommended that teachers and parents seek specialised, individualised assessment and intervention for students who have SLDs.

Location - Seat the student where they can:

- Read the board;
- Hear instructions clearly;
- Easily access teacher assistance;
- Locate reference charts;
- Find personal belongings;
- Be free from potential distractions.

Organization - Encourage a desk that:

- Is clear of “clutter”;
- Contains daily work items in a clear pencil case or a tin (contains only the “essentials” such as pencils, ruler, eraser, scissors, glue and a calculator).

A daily or weekly checklist to ensure that all stationery is available may help the student to keep track of when things need to be tidied or replaced.

Collaboration - A peer tutor needs to know how to:

- Prompt and set good examples for the student;
- Help without “spoon-feeding” them with the answers;
- Avoid distractions.

Support Success - Building self-esteem by:

- Drawing attention to any success, even if partial, e.g. “Well done! You are using the formula correctly, you just might like to check your final calculation again”.
- Drawing on student’s strengths, e.g. asking them to dictate answers verbally if extended writing is difficult.

Break It Down - Aid learning by breaking tasks down into manageable components.

- Help the student to plan each stage of a task with a familiar “plan of attack” can be helpful. For example, when approaching a word problem, asking “What sort of sum is this”, then “What numbers will be in the sum”, then “Write the sum”, etc.

Allow Extra Time - allowing students additional time in situations such as tests is a fair means of compensating for their difficulties. Additional time can also be given to a student by spending a few minutes explaining a new concept in advance before introducing it to the class, so that the information is consolidated, rather than lost in a panic.

Easy On Eyes - Try some of the following and ask the student what they prefer.

- **Font:** simple, clear font with no serifs, such as “Arial”. (This book is typeset in Arial.)
- **Size:** Medium to larger size, for example 14 point.
- **Line Length:** 45 - 75 characters including spaces and punctuation.
- **Paragraphing:** wide margins (1.5 - 2.0 cm), 1.5 or double spacing, short, clearly separated paragraphs.
- **Alignment:** Do not justify - it leads to uneven spacing on the line.
- **Emphasize:** simple headings, using bold instead of italics. Use boxes to highlight information.
- **Points:** Use bullets or numbers to identify a list.
- **Paper:** Use matt paper, and try cream or other pastel colors, as many students with SLDs find white paper harder to read from.
- **Limit** irrelevant pictures, background print and borders.
- **Additional space** for ease of working out.
- **Guiding lines**, boxes and cues to assist students with setting out their work.
- **Simple pictures**, only used to reinforce concepts or problems, not as additional decoration on the page.