PROLOGUE

This sixth teacher/parent manual in the Spiritual Syllabus Series outlines 12 Mathematics unit lessons in Class 3 and 4 – for 9 and 10-year-olds. The maths stream is essentially taught in the morning main lessons, for the first 2 hours of the day. There are 3, 3-week maths main lessons per year, or about 90 hours teaching.

But there is also a corollary stream, the Numeracy, which is presented as 3 middle-lesson units per year. These occupy the 1 ½ hour lesson between break and lunch, and are again sequential, of 3-week duration. The time scheduled being some 70 hours teaching over the year.

So mathematics/numeracy has a 160-hour allotment every year, right through primary school. Included in this is the form/dynamic drawing units, which contain also elements of writing and other fundamental coordinative skills for young children.

The miracle of maths calls on the astral forces of the learner – it calls on Imagination, or Imaginative Cognition. This is the most important faculty to be developed in the coming age – the New Age of Abraham. An intelligent and image-filled mathematics education is essential for this sublime and imperative step on the long road of the evolution of consciousness – this small manual is directed to these high ends. The following is a suggested curriculum structure, emphasizing the aspects of the human being awakened by the various number Paths – aspects detailed in the 12 articles in this book:

	CLASS 3		MATHS – ASTRAL	CLASS 4		
MATHEMATICS – HEAD	MAIN LESSONS					
	BODY	SOUL	SPIRIT	BODY	SOUL	SPIRIT
	MENSURATION	NUMERATION	CALCULATION	MENSURATION	NUMERATION	CALCULATION
	LINEAR MEASURE. PAGE 11	SIGNS & SYMBOLS PAGE 18	BORROWING NUMBER GAMES PAGE 24	AREA MEASURE PAGE 47	HISTORY OF NUMBER PAGE 54	FRACTIONS PAGE 61
NUMERACY – CHEST	MIDDLE LESSONS					
	WILL	FEELING	THINKING	WILL	FEELING	THINKING
	APPLIED NUMBER	DIAGRAMM. NUMBER	PROBLEM SOLVING	APPLIED NUMBER	DIAGRAMM. NUMBER	PROBLEM SOLVING
	MEASURE THE WORLD PAGE 30	FREE-FORM DYNAMIC DRAW PAGE 36	TIME – SPEED DISTANCE PAGE 41	MAN THE MEASURE PAGE 69	FREEHAND GEOM. DRAW PAGE 74	NUMBER SYSTEMS PAGE 79

MEASURE THE WORLD

Applied Number - Class 3 - Middle Lesson

The Class 3 teacher doesn't quite remember how he got into the (unvocalized) 'conversation' with the great Brahman Bull, named eponymously, Brahma. He had a dreamy idea that when he first saw the bull lying under the grand old fig tree, he wanted to run. But there was a kind of magnetism which drew him rather to approach. This was a bothersome distraction, because the teacher, whose name was Mene, had dong for a walk across the peaceful paddocks to think about his next 3-week middle lesson.

He had the theme, and the title – Measure the World; but he was having trouble filling in the concept with content. The unit was part of Numeracy, one of 4 middle lesson streams - the astral actually. Measure the World was the first of 3 Numeracy Strands – the Applied Number strand. This has a body or 'will' emphasis, suggesting that the measurement skills developed in this unit should be restricted to physical objects. Abstractions like time and speed do not sit well in a 'body' unit.

Numeracy finds its physical expression even in the rhythmic system of the child; middle lessons of course appeal to this central member of the human being. So the rhythmic system has 4 main elements, each of which is awakened by a different lesson type. With Numeracy it is the diaphragm, the 'gate across' dividing the *Astral*/metabolic from the rhythmic.

Anyway, back to Brahma: this magnificent cud-chewing animal, with silky coat of graduating greys, had an impressive arc of horn, under which a pair of enormous black-violet eyes gazed – albeit inwardly. It was through these two fathomless poos that Mene traveled (physically of course) to partake in a profound but unremembered discourse with his incomparably serene friend.

"But how can you help *me*, maths is a complex and sophisticated subject – and you're only a bull?"

"*Snort*! What is, of The Twelve, the learning area in the Subject Zodiac inspired by Taurus?"

"Er, dance?...no – why maths of course! Ah, Taurus the Bull! So you claim a connection to the Number Mysteries eh?"

"I do – and in the 12 Philosophical Viewpoints given to the world by Rudolf Steiner, Rationalism is that ascribed to Taurus. This is found in the fundamental outlook of people like Einstein – and Stephen Hawking!"

"I see, and those earlier Taureans, the Egypto-Chaldaic civilizations (Taurus was rising behind the sun in the vernal equinox in that period) were 'rationalistic' at heart. Measuring in particular took a quantum leap, so to speak, in that 2160 years. A good place to start in my Measure the World lesson perhaps? But in more practical terms, what can *we* measure?" Brahma looked askance at this indigence of imagination.,

"What do you see in front of you?"

"Why you? No?...Let's see, your horns maybe? My, aren't they magnificent – you think we should measure your horns!?"

"The title of the lesson is Measure the World; not those things immediately around you – it is *Global* measurement. The Linear Measurement main lesson you taught earlier in the year has the children running around measuring things (including my horns!). Now is the time to take them on an Imagination Excursion around the world."

"Around the world in 15 days!" chirped Mene.

"Don't be trivial – though it is of value for the children to know the length of the equator, and other global dimensions No, don't measure *my* horns, but say, the largest horns in the world; those on an African Ankole bull which measured 2.6 meters around the curve! You see, the crescent, as seen in many horn forms, is the archetypal moon curve. Now *that's* a good place to start a numeracy/astral – moon! – lesson. In fact your name, Mene, is Greek for moon. So this lesson is composed of 2 shining paths, one of skill development – doing sums! – and the other of knowledge; hand and head if you like, with the heart being engaged on both levels through the vibrant imagery and artistic work.

There should be a lot of drawing too; a colorful sketch of the great horned bull, with dimensions and title, says more than a dry description. After all, this *is* a middle lesson, with its expression/artistic/heart emphasis."

"Ah, so this lesson is a corollary to the Linear Measure main lesson." exclaimed Moon, er, I mean Mene! "As such, the 'world' we measure must remain within this linear context. Gosh, if you hadn't told me that, I'd be off measuring weights, areas and whatnot!"

"That's right," said Brahma amiably "and being a 'world' measuring unit, don't measure Man; that comes later in the child's unfolding consciousness, in Class 4 – oh, and don't take your 9-year-olds *off* the 'world' either, into space. Time enough for that in the future as well. So, in a nutshell, it's linear things on earth – though Man's *works* come into it, like the largest human structure in the world, the Great Wall of China…"

"Oh yes, that's 3460 ks long, and can be seen from the Men – ha, ha – but what kind of number work do we actually do?"

Basically it's 4-operations practice – or indeed any number skills learnt previously. Now this is important: unlike that Maestro of Rationalism, Einstein you can't use examples that are an impossibility in the *real* world. Einstein's theories of hurling clocks out into space faster than the speed of light sow seeds of unreality in the soul. Say you use an example where the distance from Sydney to Tokyo is wildly incorrect, it too can be a cause of future psychic illness Many inner troubles are gratuitously created by a diet of errors of thought.

It's always a good idea to start with Division first; these sums can be in either the equation or algorithm form – or be mental arithmetic even. Example: if you wore out a pair of shoes walking to Brisbane, say 100 kilometers away, how many would you discard trudging all the way to Perth – 3000 ks distant? Obviously 3000 divided by 100 = 300 pairs (put the *name* of the answer – 'pairs',

initially anyway). Many more of these sums can be done just using City A and City B. It is also good to provide the inverse operation of the sum, in this case that of division is Multiplication: If I wore out a pair of shoes in 100 kilometers, how far would I have to walk to wear out 30 pairs? 30 x 100 = 3000 *kilometers*.

Another times sum based on distance could be: if you traveled 100 kilometers to get to Brisbane, how many to get to Tokyo, which is 40 times as far? 40 x 100 = 4000 kilometers. Work out a division inverse for this too.

Then we have Addition; let's use river lengths. Note that rivers have lengths, towns have distances. This is connected with the fact that a river is a single entity – a snake has length, so does, oddly enough, time. Distance from town to town is however an abstraction, depending on which route you choose.

Is this geography or maths? Sometimes it's hard to tell, but the world-knowledge factor is a wonderful bonus in this lesson, real 'integrated learning'. However the central core, measuring, should always be returned to, no matter how interesting the discursion!

So to river lengths: what is the combined length of the Nile, at 1950 kilometers, and the Mississippi, 2014 ks? 1950 + 2014 = 3964 ks. Use similar data for Minus, as the inverse function. Again you can bring in good ol' A and B to get more mileage, so to speak, out of the sum form."

"Thanks for that – hey, there's a Kookaburra; not many people know that she has the distinction of being the largest kingfisher in the world. This appalling ignorance is just a big joke to her!"

"And to me my friend, to me – and not only ignorance of kingfishers!" Mene let this pass uncontested as he began to realize the mountain of 'length' data he would have to scale. But the Bull's tone was reassuring as he offered a suggested program.

"You could provide, say, 3 main bodies of content, measurements of the largest and smallest things in: 1. The Geographic World. 2. The Living World. 3. The Wrought World – wrought by Man that is. This conforms yet again with a 3-fold body-soul-spirit focus. This is self-evident I think.

So we have 3 weeks with one of the above programmed for each week, with its 5 days. There is also a convenient – and *real* – 5-fold division of linear measurement into: Height (and altitude), Length, Distance, Depth, Width (including thickness). That's 15 segments for 15 days: Day 1 might be Geographic/Height, with one example being the world's tallest Waterspout – a 1528-meter towering fountain recorded off the coast of Eden in Australia. When the home country has the distinction of having the biggest (or smallest) in the world, you should use it. Children relate to – and are proud of – phenomena of global status in their own land.

As there is so much pictorial content in this lesson, there is hardly need for (or time for!) a story as well. The stories naturally arise out of the content, often anecdotal. This 'picture' element arouses the child's interest by virtue of the 9th year being that of the Pictorial Aspect of the Etheric Body. There should of course be lots of both descriptive and pictorial comparisons, whether with the biggest and littlest (a 21 hands Draft Horse with a 3 hands Shetland foal from Glenorie near Sydney!) – or the biggest/smallest with the *familiar*, like Everest with Kosciusko (or your local mount)."

"Much of the material can be provided by 'homework' – voluntary of course. Also note that I referred to horses in 'hands'; use the argot of the profession where possible. Ocean depths use fathoms (translate to meters for clarity). These many *comparisons* give the children a sense of scale about the world they inhabit, this is necessary to understand the content, especially when drawn. For example, the world's thickest rope is the same dimension as your height!

So here's a quick run-down of the 15 days, for example purposes only; you will find your own riveting measurement facts! On any given day quite a few indeed. Geography/Height we've done, then there's: Geography/Length, the 2,d 'body' day – how about the Great Barrier Reef at 2077 kilometers? (Good on yer Aussie! – sorry…). Then there's Geography/Distance – to bring the image of the planet in, we could use, say, the point of the earth's surface that is the greatest distance from land (48.30 latitude south and 125.30 longitude west). Show them the position on the globe (which you should have in the classroom for this 'world' unit).

With Geography/Depth, we might use the Marianna Trench, at an awesome 5960 fathoms. Geography/Width? Um, what about the greatest ice thickness, in Antarctica of course, of 4776 meters. Needless to say the Guinness Book of Records is *the* resource for this kind of info.

Now to the Living World (soul) lessons: Living/Height – Australia again with the tallest tree on record; a now-firewood Gippsland Mountain Ash of a staggering 114.3 meters! Living/Length…the lonest animal *of all time*, the Ribbon Worm, a sea creature, at 54 meters – that's a hell of a helminth!!

Living/Distance could be the record of the Arctic Tern, with the longest flight of a (ringed, therefore confirmable) bird which winged it way south from its sub-polar home 19,300 ks to Fremantle. Living/Depth; the roots of a fig tree – like this we're under right now – being found in a mine in arid Africa 120 meters deep – now *that's* survival!

Living/Width – how about the Corpse Lily of Indonesia, with a cadaverous, fly-infested (pollinated) flower some 91 centimeters wide – a good story in this one!

And finally to the 3rd week, that of the Wrought World of Man – the spirit believe it or not. Yes, as ironic as it seems, spiritual activity (in the form of thought) is present when Man creates."

"Wrought/Height – the Sears Tower in Chicago with 110 stories soaring up to pierce the clouds at 443 meters. Wrought/Length; ah, Australian again, we (<u>you</u> actually, I'm Indian) have in Western Australia the longest conveyor belt in the world – 29 ks! Wrought/Distance – Oz again! Yes, the greatest distance traveled by a scheduled bus line is the 3389-kilometer run from Brisbane to Perth. Compare this with the shortest scheduled flight of 2 minutes, from one of Channel Isles!

Wrought/Depth goes to a gold mine in South Africa, where grateful black miners toil away 3777 meters below ground. Wrought/Width – surely we can end with the home team…? Gosh, this is hard – there it is! The Sydney Harbor Bridge – our wrought work icon par excellence – at 48 meters, the 'Coathanger' is the widest long-span bridge on earth.

So there you have it; each of these number facts (and the many you'll fossick up) has its own story. Did you know that the biggest candle ever made was 38 meters tall?"

But Mene wasn't listening, he was at that moment backing away from the huge old Brahman, wondering how he'd wandered so close – especially as it was scything its horns in a menacing way.

"Now back to this elusive Numeracy/Applied Number/Measure the World Middle lesson…? How about measuring that bull's horns – hah, a couple of girls did that last time (goodness knows how!). Better still, I'll find out what animal has the *biggest* horns in the world, that will interest the class for sure! They won't even know they're doing maths!"

The school's biggest fungi – or is that the world's!!?