

Chapter 1

Introduction

Junior Undiscovered Math Prodigies, or JUMP Math as it is more commonly known, is a Canadian-designed programme intended to help children succeed at, and enjoy, learning mathematics. During the academic year 2013-14, a pilot evaluation of JUMP Math was carried out in Ireland. The evaluation focused on pupils in Third class, and used a sample of Irish primary schools from the catchment areas of two Education Centres, Galway and Athlone.

This report describes the evaluation process and analyses the results. The main functions of the report are to:

- outline the genesis of the project, the key characteristics of JUMP Math, the research design, and the support provided to participating schools (all outlined in this chapter).
- summarise the assessment methods used (Chapter 2).
- analyse the JUMP Math materials provided to participating classes, comparing their content with the objectives of the Irish Primary School Mathematics Curriculum (PSMC) and with mathematics textbooks and materials currently used in Irish primary schools (Chapter 3).
- evaluate the fidelity with which participating schools implemented the programme, and describe the mathematical quality of programme-based instruction, using the outcomes of classroom observations conducted at two points during the school year (Chapter 4).
- establish the effects, if any, of JUMP Math on pupils' and teachers' attitudes to mathematics, drawing on the responses to questionnaires and interviews (Chapters 5 and 6).
- establish the effects, if any, of JUMP Math on pupils' mathematical achievement and teachers' mathematical knowledge for teaching, using the results of baseline and end-of-year standardised tests (Chapter 7).
- summarise the findings and the conclusions that can be drawn from the evaluation (Chapter 8).

Genesis of the project

Change Nation is a social innovation platform which promotes joint ventures by social innovators and national policy makers. Dr John Mighton was among the social innovators who attended its Dublin summit in March 2012, presenting an outline of JUMP Math.

Subsequently, with the support of the (then) Minister of State for Training and Skills, Ciarán Cannon, a Steering Committee was set up to examine the feasibility of implementing JUMP Math in Ireland. Sufficient funding was secured from public (Department of Education and Skills, Science Foundation Ireland) and private (Accenture) sources to allow the programme to be implemented in a small number of schools and to fund an evaluation of that implementation. For practical reasons, the programme was limited to schools within the catchment area of two Education Centres – Galway and Athlone – and to a single grade level (Third class).

Key features of JUMP Math

This section provides some information about the background of the JUMP Math programme (hereafter referred to as JUMP), the key principles underpinning it, and an indication of how JUMP is manifested in practice in classrooms.

Background

The JUMP programme was developed by Dr John Mighton in 1998 to tutor individual pupils who were struggling with mathematics. It was subsequently tested and adapted in classroom settings in Canada. JUMP became a registered charity in 2002, and its printed resources for teachers and pupils became available from 2003. Some of the ideas on which JUMP is based are outlined in Mighton's books, *The Myth of Ability* (2003) and *The End of Ignorance* (2007). Put simply, the programme claims to enable a higher standard of mathematics teaching, to improve the performance of all pupils, and to be highly cost-effective. Further information on the programme itself can be found at <https://jumpmath.org>, including programme philosophy, some research outcomes related to JUMP, and sample teacher and pupil materials. A support network for participating teachers is also available at <http://jumpmathteachers.org>.

Principles

The principles underpinning JUMP are described in the Introduction section of the JUMP teacher manuals (Mighton, Sabourin & Klebanov, 2010). The seven core principles are:

- confidence-building.
- guided practice.
- guided discovery.
- continuous assessment.
- rigorously scaffolded instruction.
- mental maths.
- deep conceptual understanding.

In addition, JUMP is guided by one overarching principle, which is that *all* pupils remain fully engaged with lessons.

The following sections elaborate on what each principle entails. It is, however, worth noting that the meaning ascribed to some of the terms used may not always tally with that ascribed in the general mathematics education literature. For example, if teaching methodologies were considered on a continuum from total 'Didacticism' to 'Pure Discovery', many might place JUMP's methodologies well away from the Discovery end of the continuum, yet guided discovery is one of JUMP's seven core principles. This is because JUMP's definition of guided discovery is somewhat different to that used generally. Thus, readers should note that the next sections draw heavily on Mighton et al.'s (2010) description of JUMP, and are intended purely as description, not critique.

Confidence-building

The JUMP programme is based on the belief that every child can be good at mathematics, and that a confident and interested child is more likely to learn in an efficient manner. Thus, it aims to decrease pupils' anxiety about mathematics, and to minimise the differences pupils perceive between their own ability and that of their classmates. To do this, Mighton et al. (2010)

advocate “raising the bar” in small increments and providing pupils with prompt, positive feedback.

The JUMP method advocates that most or all of the first fortnight of the school year is spent using a “Confidence Building Unit” (CBU), designed to promote pupil confidence at whole-class level. The CBUs are grade-specific, and the Third class version covers addition and subtraction of fractions (Mighton, 2013a and 2013b). The content is not part of the Irish curriculum for Third class (or the Ontario curriculum for Third grade), and is closer to the content that might be expected at Fourth class or higher. One of the reasons fractions is the topic chosen for the CBU is that it requires little text and is mainly composed of mathematical symbols (numerals zero to nine and some operation signs). The CBU is not intended as an in-depth review of fractions. As the teacher manual to the CBU indicates, “the goal of the unit is not to teach students to fully understand the connection between the symbolic operations with fractions and the concrete models that underlie those operations ... but to allow children to experience complete mastery in a rich and interesting abstract game” (Mighton, 2013a, p. 6). Thus, the aim is to show all pupils, but particularly weaker pupils, that they can complete difficult-looking challenges.

Guided practice

Mighton et al. (2010) argue that repetition and practice are key to learning, and that component skills must be repeatedly practised before “the big picture” can be understood. They believe that “working memory” is limited and can have difficulty processing a large amount of new information. With this in mind, the *JUMP Assessment and Practice Workbooks* (Mighton, Sabourin, & Klebanov, 2009) given to pupils are intended – in conjunction with JUMP lesson plans – to provide opportunity for guided practice and repetition.

Guided discovery

Mighton et al. (2010) define guided discovery as allowing pupils to take moderate risks by exploring tasks that are within their grasp, yet have an element of inquiry-based learning. They suggest that discovery should form a part (but not the entirety) of any well-planned lesson, with independent work balanced by explicit hints and instructions. More recently, Mighton (2013c) has elaborated further on the drawbacks he sees to a “pure discovery” approach. In particular, he suggested that the use of too many illustrations and concrete materials could prove distracting, and that discovery learning could place too heavy a burden on working memory.

Continuous assessment

The JUMP approach requires teachers to make regular use of continuous assessment activities. The teacher manuals show how to reduce learning into discrete steps and how to assess each step. In addition to “mini-quizzes” and tasks following the introduction of each new skill or concept, JUMP advocates a monthly cumulative review, using a selection of related workbook questions copied onto a single sheet. Teachers are also warned that the purpose of continuous assessment is not ranking, but to allow pupils to show their knowledge and teachers to “differentiate instruction with small individual interventions” (Mighton et al., 2010, p. 5).

Separately, Mighton (2007) has described his ideal approach to assessment as involving “visible” and “invisible” assessment methods. Visible assessments are marks awarded to pupils for particular tasks or tests. There would be only two grade levels: “A” and, for pupils who had done particularly well, “A+”. Teachers would proceed to the next topic only once all pupils had achieved one of these grades. Invisible assessment would consist of something similar to a

diagnostic profile for each pupil. This would be passed between teachers as pupils progressed through grade levels, and shared with parents but not with pupils.

From an Irish perspective, it is worth comparing how the PSMC and JUMP differ in relation to continuous assessment. The PSMC also places a strong emphasis on assessment, but specifies the importance of *formative* as well as summative assessment and suggests tools for producing formative data: for example, pupil portfolios and curriculum profiles (National Council for Curriculum and Assessment & Department of Education and Science, 1999). In contrast, JUMP methods – at least, as outlined in the teacher manuals – seem designed to produce largely what the PSMC would define as summative data (although Mighton et al. [2010, p. 5] do use the term “formative” to describe JUMP assessment methods). While Mighton’s *theoretical* perspective recognises the importance of formative (“invisible”) data, as defined in the PSMC, tools such as pupil portfolios are not discussed in the JUMP manuals and are therefore unlikely to be used by teachers adhering strictly to JUMP methodologies. However, individual teachers can adapt standard JUMP assessment methods to yield formative and diagnostic data.

Rigorously scaffolded instruction

The JUMP teacher manuals argue that pupils can only retain a limited amount of new information or steps at any given time, meaning that all instruction should be broken down into sequential, scaffolded steps, with strong direct instructional guidance from the teacher.

The lesson plans in the manuals contain suggestions for how to break procedures into simpler stages. For example, when teaching mixed fractions, a teacher might break the procedure of drawing these into two steps. First, the pupils could learn to draw the number of wholes present, before learning to draw the fractional part.

Mental maths

In the JUMP teacher manuals, Mighton et al. (2010) argue that “mental math is the foundation for all further study in mathematics” (p. 6). Familiarity with mathematical patterns, through consistent practice, is believed to facilitate pupils’ understanding of how numbers interact. In turn, they can then calculate quickly without having to recall number facts.

Deep conceptual understanding

Mighton et al. (2010) say that JUMP proposes the simultaneous teaching of symbolic and concrete understanding of key mathematical concepts, using a variety of approaches. An aim of JUMP is that teachers can see mathematical “big ideas” even in small steps, while learning how to relate the small steps to wider contexts and procedures.

Mighton (2003, p. 58) explains that “even in the most basic units, students are expected to explain how operations work and generalize rules to deal with new cases by themselves”. While he believes that an approach that teaches rules before concepts can have major benefits for the confidence of struggling pupils, the ultimate aim of JUMP is to create conditions in which concepts can be taught before rules, and pupils can discover mathematical principles on their own.

Keeping all pupils engaged

JUMP aims to keep all pupils engaged by providing challenges that grow incrementally harder in the form of bonus questions – designed to look demanding (e.g., by using larger numbers than usual), but which rely on skills and concepts that pupils have already mastered. Bonus

questions are intended to keep stronger pupils engaged without teacher intervention, enabling attention to be diverted to any pupils who are struggling. Examples of bonus questions are included in all pupil workbooks and teacher manuals (which also suggest strategies for creating further bonus questions).

As well as maintaining individual pupil engagement, JUMP seeks to create collective, whole-class enthusiasm. Pupils moving through materials at faster speeds do not move to the next topic, but instead complete bonus questions on the same topic until the whole class can proceed. The idea is that knowledge gaps among pupils can thus be closed, and that pupils will experience success as a group. Mighton (2007) describes the anticipated enthusiasm as a form of “collective effervescence”, following Émile Durkheim.

JUMP also aims to make pupils excited about mathematics by pointing to “the beauty of mathematics as a symbolic language connected to the real world” (Mighton et al., 2010, p. 2). Thus, in the mental mathematics strategies, emphasis is placed on patterns (e.g., the fact that the sum of digits in any two-digit multiple of nine is always nine).

JUMP in practice

The preceding sections outlined the key principles underpinning JUMP. For the purposes of the evaluation, it was important to operationalise these principles – that is, to define how adherence to abstract principles might be manifested in classroom practice, and in a manner that could be measured. However, it should also be noted that many of the more aspirational JUMP principles broadly align with what is commonly considered good classroom practice. For example, as noted earlier, continuous assessment is a key element of the Irish PSMC. As such, a crude measure of how regularly teachers assessed pupils might not distinguish between teachers following JUMP or PSMC principles.

That caveat aside, it seems likely that mathematics teaching that adhered closely to the JUMP methodology would include the following features:

- use of the JUMP “Confidence Building Unit” (CBU) at the start of the year.
- frequent use of “Mental Math” strategies, as described in the teacher manuals.
- provision of highly scaffolded instruction, following the detailed lesson plans described in the teacher manuals.
- use of bonus questions as a means of offering differentiated teaching.
- progression through topics at whole-class level.
- drawing attention to “beautiful” aspects of mathematics and making real-world links.
- frequent assignment and correction of mini-quizzes and cumulative reviews.
- large amounts of repetition and practice of mathematical concepts.
- large amounts of teacher-led questioning and explanation.

In addition, as JUMP pays considerable attention to building pupil confidence, and retaining high levels of engagement throughout the school year, it would seem likely that pupils experiencing successful implementation of the programme should develop significantly higher levels of mathematical self-confidence, and report greater interest in, and enjoyment of, mathematics.

Research Design

In June 2013, Galway Education Centre and Athlone Education Centre invited interested schools to apply to participate in a small-scale evaluation of the JUMP programme in an Irish context. The invitation provided some background information on JUMP and an outline of methods to be used for the evaluation. Schools were advised that in addition to the outcomes of standardised tests, the evaluation would include classroom observations of mathematics lessons, and interviews with teachers and pupils. The invitation indicated that selected schools would receive:

- free training in the methodologies underpinning JUMP.
- free JUMP classroom materials (teacher manuals and pupil workbooks) for a school year.

In total, 23 schools applied. The Steering Committee had planned that 12 schools would be selected for the JUMP programme, with the remaining schools used as a control group against which performance could be compared. Non-selected schools were to be offered the possibility of participation in a JUMP programme in the 2014/15 school year. Schools were to be selected with reference to a geographical balance between areas covered by the two Education Centres.

Having recruited schools, an invitation to tender for the research evaluation was issued in July 2013, and the work subsequently awarded to the Educational Research Centre (ERC). ERC staff proposed a revised design, outlined in the next section.

Revised research design

The main change to the study design was an attempt to address a) a probable Hawthorne Effect¹ for selected schools, and b) a demotivating effect for non-selected schools. As noted, non-selected schools were to be offered the possibility of participation in a JUMP programme in the 2014/15 school year. However, this might have had the unintended consequence of a de-emphasis on mathematics in those schools during the 2013/14 school year. To counteract this and any Hawthorne Effect, the ERC proposed a second comparison intervention as part of the evaluation. The Steering Committee agreed to the proposed change.

A number of maths programmes were examined (by staff at the ERC and in the Education Centres) as potential comparison interventions. The Professional Development Service for Teachers' (PDST) new programme – IMPACT Maths (Interactive Methods and Practical Approaches to Communication and Thinking) – was selected. There were three main reasons for choosing IMPACT. First, like JUMP, it was directed at all pupils in a class rather than targeting only weaker or higher achieving pupils. Second, in contrast to JUMP, it was developed to align very closely with the content and pedagogical framework of the Irish PSMC. Third, in contrast to JUMP, it adopts a social constructivist approach, with emphases on pupils sharing and discussing mathematics, and following broad-based learning trajectories. JUMP, on the other hand, breaks mathematics into highly specific skills and concepts which are taught through teacher-dominated questioning and explanation, followed by graded individual pupil practice.

¹ The Hawthorne Effect is the phenomenon whereby people tend to improve or modify an aspect of their behaviour once they are aware that they are being studied. Commonly known methods to reduce such an effect include the use of placebos, assessing more than one intervention, or double blind studies.

Although IMPACT materials were not available for all strands (only covering Shape and Space, and part of Number), the programme's principles and methods are intended to be generalisable across strands. This meant that it was suitable as an overall comparison group, and addressed the Hawthorne Effect. However, the fact that no materials were available for the Measures, Data, and Algebra strands should be borne in mind when interpreting programme effects in later chapters.

While the final evaluation design included a comparison of two programmes, and both were given equal importance in all communications from the ERC to schools, it is possible that some teachers selected for the IMPACT group felt they were assigned to a lesser programme, or were not allocated their first choice. This is not due to programme characteristics, but to the fact that the initial invitation referred to JUMP only. Thus, the possible perception of IMPACT as a lesser programme may mean that a Hawthorne Effect could have operated differently in the two groups.

Participants

Of the 23 schools that applied to participate, two withdrew in September 2013. One was replaced, giving a final sample of 22 schools, of which 12 were in the Galway Education Centre catchment area and 10 in the Athlone Education Centre catchment area. As most schools had a single Third class group, the total number of participating class groups was 27 (13 in Galway and 14 in Athlone).² All schools but one were mixed-sex. In 14 schools, the Third class group(s) were single-grade, while eight schools had multi-grade classes (the most common combination being Third and Fourth classes). The sample was reasonably balanced by rural/urban location (15 versus seven schools, respectively) – urban being defined as a school situated in a town with a population in excess of 5,000. In practice, all but one of the participating urban schools were in towns with population in excess of 20,000. Although fewer schools were in urban than rural areas, the larger average size of the urban schools meant that pupils were evenly split by location (280 in urban schools and 289 in rural schools).

Method of assigning schools to programmes

The small numbers of participating schools meant random allocation to programmes was unlikely to create two balanced, matched groups. Thus, schools were assigned to sample groups using an iterative process, to maximise comparability across the following key variables:

- prior achievement on standardised tests.
- number of schools, classes and pupils.
- geographical location (urban/rural).

Schools supplied the ERC with anonymised achievement data from standardised tests of mathematics achievement administered at the end of the 2012/13 academic year. These data were used to ensure that there were minimal pre-existing differences in mathematics achievement between the JUMP and IMPACT groups. Some schools had used the Drumcondra Primary Mathematics Test (DPMT) while others had used the Standardised Irish Graded Mathematics Attainment Test (SIGMA-T). As scores on different standardised tests could not be assumed to be directly equivalent, schools were assigned to programmes in a way that minimised difference not only on overall mean achievement, but also on DPMT and SIGMA-T scores.

² Initially, 28 classes were listed as participating. However, one JUMP school which had applied with two participating class groups decided to combine these for mathematics lessons during the pilot year.

Alongside prior achievement, numbers, and urban/rural location, two other factors were also taken into account – neighbour effects and balance between the Education Centres. As it was possible that schools located close to each other might share aspects of their programme that they found useful, any neighbouring schools were assigned to the same condition. In addition, an effort was made to achieve similar proportions of JUMP/IMPACT schools in the Athlone and Galway areas.

Characteristics of final samples

Table 1.1 summarises characteristics of schools and pupils assigned to each of the interventions. Twelve schools (13 class groups containing 295 Third class pupils) were allocated to JUMP, while 10 schools (14 class groups containing 274 Third class pupils) were allocated to IMPACT Maths.³ The JUMP group comprised eight rural schools (176 pupils) and four urban schools (119 pupils), while the IMPACT group comprised seven rural schools (113 pupils) and three urban schools (161 pupils). Seven schools in each group had single-grade classes, while five JUMP and three IMPACT schools had multi-grade classes.

Mean prior achievement scores for the two groups were within a point of each other (108.5 for JUMP pupils, 109.4 for IMPACT pupils). Both groups contained a mixture of pupils who had been administered the DPMT and the SIGMA-T. As well as a close match on overall mean achievement, the means for the DPMT and SIGMA-T were closely matched across groups. In sum, both the JUMP and IMPACT groups of schools and pupils were closely matched on all key variables, including initial pupil mathematical achievement.

Table 1.1: Summary characteristics of JUMP and IMPACT school, class, and pupil participation

		JUMP	IMPACT	Total
Schools <i>N</i>		12	10	22
Classes <i>N</i>		13	14	27
Pupils <i>N</i>		295	274	569
Location (schools <i>N</i>)	Rural	8	7	15
	Urban	4	3	7
Education Centre (schools <i>N</i>)	Athlone	5	5	10
	Galway	7	5	12
Class structure (schools <i>N</i>)	Single-grade	7	7	14
	Multi-grade	5	3	8
Mean achievement score		108.5	109.4	108.9 ⁴

Nature of support provided to schools

Teachers in both programmes received tailored Continuing Professional Development (CPD) and additional materials. The nature and extent of support to be provided to the JUMP programme participants was based on advice from JUMP personnel, and had been established prior to the involvement of the ERC. Therefore, support for teachers in the IMPACT programme was tailored to mirror that offered to JUMP participants.

³ Initially, schools were slightly more evenly split. However, one teacher from a school assigned to IMPACT subsequently informed the ERC that she was familiar with, and used, JUMP methodologies. Her school was therefore re-assigned to the JUMP group.

⁴ Means may not match exactly, due to rounding.

Continuing Professional Development (CPD)

Over the course of the evaluation, teachers were invited to three CPD sessions related to their assigned programme. The first of these took place on Saturday, September 7th 2013. JUMP training was delivered by Dr John Mighton, while IMPACT training was delivered by three representatives of the PDST. Each group of teachers was welcomed to the session by the then Minister of State, Ciarán Cannon, and the Director of Athlone Education Centre, Frank Walsh, and each session lasted approximately six hours. As far as was possible, the two programmes were accorded equal status.

The JUMP training included illustrations of how the programme's principles might be put into practice – for instance, how to scaffold a lesson on parts and wholes, how to devise bonus questions to motivate pupils, and how to point out number patterns so as to excite pupils' mathematical curiosity. A video of Dr Mighton using the JUMP methodology to teach a lesson on perimeter was shown to demonstrate some of these points. There was little specific reference to the JUMP teacher manuals. The IMPACT training included discussions of the programme's philosophy of "teaching in the concrete and pictorial for understanding in the abstract" and techniques such as re-voicing. Unlike the JUMP training, it incorporated small-group discussions, group exercises using concrete materials, and references to specific pages of the (two) IMPACT manuals available at that time. Thus, in certain ways, the manner of CPD delivery mirrored the different philosophies of the two programmes. JUMP CPD was very much led by the "teacher", targeted at the whole group, and involved little shared learning. In contrast, IMPACT was more "student"-led, with a somewhat social constructivist approach to CPD.

The sessions were attended by at least one teacher from 69% of JUMP classes and 71% of IMPACT classes. In most cases, the class teacher attended, but in a few cases, it was the resource teacher, or both class and resource teachers. The slightly low attendance rate can largely be attributed to the short notice given to teachers (as little as six days in some cases) for training delivered on a Saturday. A delay in accessing an element of the project funding led to a delay in establishing Dr Mighton's availability (around which *both* sessions were scheduled), all of which contributed to the short notice given to teachers.

For those who could not attend, recordings of the sessions were placed on the Galway Education Centre website. Follow-up in December 2013 revealed that only two non-attending teachers from each group had watched the recordings. Thus, two classes in each programme were taught for a full term by teachers who had neither attended the initial training session, nor accessed the recorded version of it.

The next two CPD sessions for each programme were in webinar form. The first of these took place on November 25th (JUMP) and 26th (IMPACT). Teachers were invited to log in either at Galway Education Centre or from their home or school. Dr Mighton facilitated the JUMP webinar, while a PDST representative facilitated the IMPACT one. The JUMP webinar dealt predominantly with questions raised by participating teachers, while the IMPACT webinar dealt with the strand for which materials had most recently been developed, i.e., Shape and Space. Across both groups, eight classes had at least one teacher in attendance (information is unavailable for one IMPACT teacher). Again, low attendance can be at least partly attributed to the short notice given to participating teachers. Short notice was largely due to the difficulty of scheduling around mid-term, Dr Mighton's availability, generally, and his availability in a suitable time zone, specifically.

Combining data on attendance or online viewing of the September session with participation in the November webinars revealed that one JUMP class and two IMPACT classes were taught by teachers who had not received *any* related CPD up to the end of 2013.

The second set of webinars had a similar format, and took place on February 10th (JUMP) and 11th (IMPACT). At least one teacher attended from 69% of JUMP classes and 86% of IMPACT classes. (A few JUMP teachers who tried to log in could not do so, due to technical problems). For JUMP teachers, the webinar involved another question and answer session, with Dr Mighton providing examples of how teachers might tackle specific problems they were having. For IMPACT teachers, the webinar involved further suggestions on teaching Shape and Space in accordance with the principles of the programme. Teacher participation in CPD is summarised in Table 1.2.

Table 1.2: Percentage of classes from which teachers participated in CPD, by programme

	JUMP (N=13)	IMPACT (N=14)
Teacher(s) attended live CPD	69	71
Teacher(s) watched video of live CPD	15	15
Teacher(s) took part in first webinar	62	62
Teacher(s) took part in second webinar	69	86

Materials

Each teacher was supplied with materials appropriate to their assigned programme.

JUMP materials

The JUMP materials are analysed in detail in Chapter 3. Broadly, they consisted of teacher manuals for levels 3.1 and 3.2; pupil workbooks, also levels 3.1 and 3.2; and teacher and pupil versions of the supplementary “Confidence Building Unit”, level C. These materials are intended to cover the complete Ontario and Western and Northern Canadian Protocol mathematics curricula at Grade 3 (broadly equivalent to Third class in Ireland). The manuals and pupil materials were very detailed, totalling 731 pages for teachers (including answer keys and Blackline Masters materials), and 349 pages for pupils. Following the first webinar, some JUMP teachers requested Level 4 materials also. Pupil workbooks 4.1 and 4.2 (but not the matching teacher manuals) were delivered to all JUMP classes in January 2014.

IMPACT materials

The IMPACT materials consisted of teacher manuals for three strands/strand units from the Irish PSMC: Fractions; Place Value, Percentages and Decimals; and Shape and Space. However, the PDST representatives emphasised during CPD that the intention was to provide *examples* of how the programme’s principles could be used in particular strand units, but that teachers could themselves apply the principles to other areas of the curriculum. In correspondence with the PSMC, the Number manuals dealt with teaching the content to all levels from First through to Sixth class, while the Shape and Space manual dealt with levels from Junior Infants to Sixth class. In total, the manuals were 430 pages in length, with 96 pages specifically relevant to teaching Third class. No pupil materials accompanied the IMPACT teacher manuals, which recommended the use of readily available classroom items in maths lessons.