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Using the Adult Literacy

including Spoken Communication

and

Adult Numeracy core curriculum in Northern Ireland





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Minister's Foreword

I am personally committed to improving the essential skills of literacy and numeracy in Northern Ireland. In this day and age it is unacceptable that over 20% of our adult population has difficulties with literacy and numeracy. It is one of the key challenges that my Department and the Executive faces. Improving levels of these essential skills holds the key to the future success of Northern Ireland, as a society, as an economy and as a culture.



One of our first tasks is to introduce a curriculum for Essential Skills to enhance the learning of adults and to guide teaching and learning. In the Framework and Consultation Paper on Essential Skills, it was proposed that the Adult Literacy and Numeracy Core Curriculum already implemented in England and Wales be tested in Northern Ireland. My Department commissioned a pilot curriculum project which included Further Education colleges, a number of New Deal, Focus for Work and Jobskills schemes and several organisations from the voluntary and community sector to examine fully the appropriateness of the Core Curriculum.

The curriculum has received widespread support from the pilot groups and it has been decided to adopt the Adult Literacy and Numeracy Core Curriculum in Northern Ireland. The learning from the pilot project has been used to produce guidance on how to use the curriculum in the Northern Ireland context.

The guidance will provide teachers with a comprehensive framework to help identify and meet each person's individual learning needs, including examples of teaching strategies they can use. For learners, it will ensure that, no matter which type of course they choose or where the learning takes place, they can be confident of a common approach and effective support.

I am sure that this curriculum and guidance will prove an invaluable tool. It is designed primarily for teachers and tutors of adult literacy and numeracy, but it will also be very useful for programme managers, those involved in the development of training materials, and to the growing body of organisations and individuals with an interest in Essential Skills.

arhel Hama

MRS CARMEL HANNA MLA Minister for Employment and Learning

In the Framework and Consultation Paper on Essential Skills it was stated that in Northern Ireland (NI), we would accept the **standards** introduced by the Department for Education and Skills (DfES) in England and Wales, and it was proposed that we would introduce a **curriculum** to guide teaching and learning. We are delighted that not only has this idea been warmly received by tutors and those involved in this area of work, but the NI pilot curriculum project commissioned by the Department for Employment and Learning (DEL) has also endorsed this proposal.

It was proposed in the consultation framework document that the Adult Literacy and Numeracy Core Curriculum already implemented in England and Wales, be introduced in NI. In order to examine fully the appropriateness of that proposal, DEL set up a pilot project, which included tutors from the FE colleges, a number of New Deal, Focus for Work and Jobskills schemes and several tutors who provide Essential Skills in the voluntary and community sector. The members of this pilot group worked extremely hard to come to grips with the curriculum in a very short space of time and, on the basis of their first hand experience of working with the documents with their own respective learners, have provided DEL with helpful advice about using the curriculum in NI. They have advised that the core curriculum should be introduced and have produced some trial units of work, which will be published in due course. This guidance is, therefore, designed to help with the introduction of the DfES curriculum in the NI context. The outcome from the pilots project and the experience of using the core curriculum in the NI context, will contribute to its review by DfES in 2004.

Each of the literacy and numeracy curriculum contains its own introduction, which explains how the documents are set out and how they are informed by the standards. Some of the contextual background is specific to England and Wales but the picture of the learners for whom the curriculum are designed, has much in common with that in NI. Details of the learners in the province are contained within the framework for consultation. The table providing information on how the levels of achievement covered by the curriculum sit within the National Qualifications Framework is applicable in NI. There are some differences in the accreditation procedure but these are addressed later in this guidance paper.

It is important at the outset for tutors to familiarise themselves with the structure of the curriculum. Each subject (i.e. each of literacy and numeracy) contains three strands:

Literacy covers the ability to:

- *speak, listen and respond* i.e. the development of the ability to express and communicate meaning in spoken language and to interpret what others say, matching style and purpose to audience and context.
- *read and comprehend* i.e. the development of the ability to read understand and engage with various types of text for enjoyment and learning.

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• *write to communicate* i.e. the development of the ability to make and shape text in order to communicate meaning in written language, appropriate to context, purpose, reader and audience.

Numeracy covers the ability to:

- understand and use mathematical information
- calculate and manipulate mathematical information
- interpret results and communicate mathematical information

These capabilities are woven through three elements:

Number i.e. the development of an understanding on number, number notation, number operations and the ability to make use of appropriate methods of calculation.

Measures, shape and space i.e. the development of the ability a) to recognise and use the properties of two-dimensional and three-dimensional shapes; b) to recognise locations and to use transformations in the study of shape; c) to estimate and measure quantities and appreciate and approximate nature of measurement.

Handling data i.e. the development of the ability to collect, record, process, represent and interpret data and to understand, estimate and calculate probabilities.

Each of these 'strands' shows progression in the skills, knowledge and understanding needed to achieve the standards at Entry level (with its three individual levels), Level 1 and Level 2.

The pilot groups found it useful to bring together all of the strands applicable to each level within each of the two subjects and thus build up a composite picture of the scope of the work to be covered at each level. Appendix 1 presents the curriculum in summary form this way. It should also be noted that both the literacy and numeracy curriculum, are available at www.basic-skills.co.uk and on a CD Rom available from DfES publications PO box 5050 Sherwood Park Annesley Nottingham NG15 ODJ so that any user can cut and paste to reorder the document in whatever way best suits his or her needs.

The tutors involved in the pilots also felt that because of the recursive nature of development in language it would be useful to have a more holistic overview of the progression within the three main elements of literacy. Such an overview is provided in appendix 2.

Establishing a starting point: initial assessment

Even though adults requiring help with essential skills have often had a hiatus in their learning or experienced some difficulty with it, frequently leading to a lack of confidence in their abilities, most of them come with wisdom gained from a wide experience of life. Their achievements, therefore, are usually quite uneven and can straddle a number of achievement levels. This is particularly so within entry level where, for example, it is not uncommon for an adult's competence in speaking, listening and responding to be at entry level 3, his reading at entry level 2 and his writing ability to be at entry level 2 or even 1; similarly, a learner might have achieved entry level 3 in measures, shape and space but her ability in number or handling data might be at a lower level.

For these reasons, it is of critical importance to ascertain from the outset what learners can do, what they are interested in and what expectations they have; it is also important to ascertain what is their learning behaviour and style of learning, how they get along with their peers and other learners and what is their general level of self-confidence. It is crucial that the first few sessions with a new adult learner are focused on learning activities that enable the tutor to make an initial assessment of what the learner brings to his learning; it is on these judgements that the tutor will build a learning programme.

The pilot project was asked to look at how the curriculum could support the process of initial assessment. To prompt tutors to explore and assess prior achievement, the group designed a simple proforma, which is included in appendix 3.

Initial assessment is frequently used to determine 'a level' in order to allocate a learner to a class or to determine the support required to improve. The pilot projects concluded that the most usual approach was to get the learner to take a short test such as the Basic Skills Agency Initial Assessment. They also found, however, that the initial assessment tests do not provide a broad enough picture of a learner's achievements and capabilities to reflect the breadth of the new literacy and numeracy curriculum, nor do such tests enable tutors to make judgements about a learner's learning style and behaviour.

It is doubtful whether any test completed in a short period of time can provide such breadth. What is important is being able to assess the actual competences in language and numeracy that a learner demonstrates on real tasks whose meaning and purpose the learner understands. It is also important to be able to say something about how he approaches his learning. Below is an example, which describes some of the competences that a tutor might identify from what a learner demonstrated in the first two sessions. What should be noted is the level of specific detail that describes the language competence in each of the two strands illustrated. Initial assessments such as this example, can be made on the basis of work observed.

example : speaking, listening & responding

In small informal groups of learners with whom Janice has much in common, she is quite ready to talk and does so fluently; contributions are usually personal narratives or stories of events concerning others she knows; they focus on what happened next; language is informal, conversational and makes frequent use of dialect and idiom; there is little reflection or analysis. Janice tends to find it more difficult to express feelings or more abstract ideas; judgements if made, tend to be sweeping or unyielding rather than reasoned and showing consideration of different viewpoints.

example : writing

Janice is able to communicate straightforward meaning in short sentences, which are usually, but not always, properly punctuated. She mostly writes to convey factual information or simple narrative accounts. Sentences are usually in the form of single clauses or a main clause followed by subsidiary clauses each linked with 'and', mirroring her speech patterns. She is able to spell most common words correctly.

example : learning behaviour

Janice is keen to improve her language abilities. She works well with other learners and has an infectious enthusiasm. Janice responds quickly to oral questions; she also writes quickly; her speed is often prompted by her keenness to succeed but it is at the expense of accuracy and the reflection necessary to shape her ideas and decide how best to communicate them.

The next stage for the tutor is to ascertain at which level the learner's achievement sits – a best fit approach should be adopted i.e. which set of 'level' competences best match those of the learner. The tutor should also remember to look carefully at the levels above and below that at which he deems the learner to be and also remember that the learner may demonstrate a higher level in one strand than in another. A learner does not necessarily have to achieve every single competence to have achieved the standard at a particular level. If a learner's ability in number is comfortably within entry level 2, then the learning programme should be targeted at achieving entry level 3.

The pilot projects have indicated that the descriptors and some of the exemplar activities in the curriculum can help tutors make such initial assessments although the tutors have expressed a need for more in-service training. The external assessment tasks which will be provided initially by Northern Ireland Council for the Curriculum Examinations and Assessment (CCEA) (see section on accreditation and assessment on page 15) will provide support to help tutors develop their skills of assessment, and to generate and analyse their own assessment activities and to use the judgements they make to plan with the learners, the next stage of their programme.

Preparing a learning programme

The next part of the pilot project was to develop units of work; a unit of work is defined as a programme to take forward the learning of an individual or group over approximately six sessions. The literacy and numeracy curriculum represent in generic terms the skills and knowledge required to meet the standards; however, these need to be taught and developed through meaningful and coherent contexts which allow the learners to apply their skills and knowledge. The pilot groups devised a proforma (included at appendix 4) to help them with such planning and, in particular, to help them focus clearly on the expected progress to be achieved in language and mathematics, the teaching that would be necessary and the assessment that would allow the tutor to judge whether progress had been achieved.

The tutors in the pilot projects had no difficulty in identifying areas of interest or topics around which to base their learning; these included homelessness, football, shopping, planning a visit, and everyday measurements used in cooking and do-it-yourself; they often made imaginative use of newspaper articles and everyday memorabilia. The most effective units of work:

- identified the specific language or mathematical strengths and shortcomings in the learners' work through careful scrutiny of what they demonstrated they could do;
- evidenced a clear focus on advancing learners' specific capabilities in language and mathematics;
- achieved a good balance between developing skills and knowledge, and understanding them *and* applying them in meaningful contexts;
- integrated effectively the various strands within the curriculum;
- could be used with groups of learners working at different levels either the tasks were differentiated or it was possible to differentiate the quality of the learner's work;
- identified what teaching was needed to introduce or extend new concepts, skills or thinking, along with where and how it might best be done;
- included a variety of different learning situations and approaches;
- placed appropriate emphasis on talking to learn and on acquiring vocabulary to describe the procedures or concepts learnt; and

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 used the potential of information learning technologies (including calculators) to teach new concepts and skills and to extend learning.

A few examples of sequences of learning that are illustrative of such effective practice are included at appendix 5. More of these trial units will be published separately.

Caution!

There was a tendency for some of the units to be made up simply of worksheets, many of which were over-structured and did not, for example, encourage the learners to make meaning for themselves or to make decisions about how to present their information. In some there was also a tendency to focus exclusively on the practising of skills without helping the learners to learn to apply them appropriately. Often tutors also needed to include more direct teaching within their programme of learning.

A further word about skills, knowledge and understanding

The introduction to the core curriculum emphasises three key points, which are crucial to planning and advancing learning:

- a) the need for the separate elements in the curriculum to be brought together;
- b) the importance of the learner using and applying his skills and knowledge;
- c) the need for learners to understand the purpose and relevance of what they are doing.

The experience from the pilot projects has indicated that further explanation of these important principles would be useful.

A curriculum describes what is to be taught. In order to do that, it is often necessary to separate out aspects of learning that in practice are taught together. It is also necessary to distil out the skills and knowledge to be taught, even though to do so may divest them of a context in which their application is more fully understood. Thus, for example, in the core curriculum for numeracy, number is separated from measures, shape and space and from handling data. Even more significantly in the literacy curriculum, reading, is separated from speaking, listening and responding and is sub-divided into text, sentence and word focus; in writing, composition is described separately from grammar and punctuation. Although there are some occasions when these skills and associated knowledge, may need to be taught separately, in most instances they will not. In all cases, where these skills and knowledge are taught separately, the learner needs to 'prove' his learning and understanding by using them in ways that are part of 'normal' adult life.

It is also worth noting that just as a learner's achievement does not necessarily sit comfortably within the linear progression described by the curriculum, nor do the uses we make of literacy and numeracy in everyday adult life. Decimals, for example, do not appear in the numeracy curriculum until entry level 3, although the vast majority of adults have some understanding of how our money system works, (even though they may not be able to calculate, manipulate or interpret the numerical information with the flexibility that they need). In planning a learning programme, therefore, it is always important to build on what adult learners know and the situations in which they live and work. A good tutor may consequently, often use the curriculum in a non-linear manner.

Literacy and numeracy are complex capabilities. For many people the most obvious element is the development of skills, that is the mental and physical abilities involved in remembering basic facts or rules or learning to recognise and reproduce letters and numbers. However, although these may be what we see happening when someone is working with language and number, being literate and numerate involves much more.

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Consider the diagram below and the explanation, which follows, both of which are adapted from, 'Literacies in the Community'

DEVELOPING LEARNERS' KNOWLEDGE, SKILLS AND UNDERSTANDING

Understanding: the capacity to question and evaluate the conventions for literacy and numeracy in any situation so that conscious choices are made. This social and critical awareness is developed by looking at differences in practices and posing questions, investigating and evaluating.

> The Adult Learner

Skills: the mental and physical abilities involved in recalling basic rules and facts and recognising and reproducing letters, numbers, signs and symbols. This technical ability is developed by memorising and practising.

Knowledge: the mental store of 'ways of doing' or conventions for using literacy and numeracy (ie genres, processes) and the capacity to select from this store for a specific context and purpose. This flexible competence is developed by relating knowledge to real contexts and by becoming aware of general principals through making generalisations, problem solving and contrasting and comparing. When as adults, we use our skills of communicating and using number, we are also drawing on our mental store of ways of using language and number, in other words, our knowledge of the social conventions for carrying out tasks. For example, in order to make sense of the text of a newspaper story, adults will use their skills in recognising and decoding the printed words along with their knowledge of the conventions of newspaper reporting, such as the use of headlines, the selection of information reported or the use of carefully chosen quotations from selected individuals to achieve a particular response. Our knowledge of how different ways of using language and number can have a different impact, serves to guide and focus the way we use our skills. Knowledge and skills are essential but they are not sufficient – especially in this information age. **Adults need to be able to question critically and to evaluate as they read, write and use maths, so that they can decide how best to respond.** In the example of the newspaper story above, the reader will not simply want to know what the story says but also to ask how reliable and informative it is.

To take a numeracy example, adults shopping in a supermarket recognise and calculate numbers and combine these skills with a knowledge of the conventions for displaying process and quantities, in order to work out the costs. Adults, however, do not simply want to know the cost, they want to be able to determine what is best value.

Both these examples illustrate that to decide how relevant and reliable are the ideas and information we handle, we need to appreciate how the conventions that are used can influence how we interpret the information or ideas. This critical questioning and evaluating of how we and others use language and number is concerned with understanding why the ideas and information we handle as we read, write and use number, are as they are; it illustrates too how we might choose to act differently than if we simply took things at face value.

Reading, writing, and using number are not skills adults exercise for their own sake but activities firmly rooted in getting things done in the different roles we play as private individuals, family members citizens workers and learners. Once we focus on using literacy and numeracy in adult life, we can see the importance of recognising that the capacity to use literacy and numeracy, involves knowledge, skills and understanding.

This understanding of literacy and numeracy as complex capabilities makes a significant difference to how we see the curriculum. It means that tutors and learners need to pay attention to, and go back and forth between, developing all three aspects rather than assuming a linear development from skills to knowledge to understanding.

Developing Learners' Skills

The need to cover all aspects in teaching and learning means the tutor and learner must be very selective about the skills they want to focus on. There is a wealth of printed and computer based `skills worksheet` material now available and it can be tempting for the

learner simply to work through everything he/she cannot do. The routine facts, formulas, rules and skills found in these worksheets can be thought of as the `small parts` of writing, reading and numeracy and learning; these involve memorising and practice. This kind of learning needs repetition and reinforcement not just through study at home but through using the skills in the context of an actual literacy or numeracy task. We know now that learners will find it difficult to retain skills they are not able to use in some way, so the more focused the learner and tutor can be on the most usable skills, given the learner's goals, the more quickly the learner will make progress.

Developing Learners' Knowledge

One of the reasons that focusing on skills and the 'small parts' of reading, writing and numeracy is attractive is that the basic skills, rules and facts seem stable and indisputable. Alongside specific knowledge, learners also need to develop a sense of how to apply what they know to real contexts and purposes and to develop an awareness of general principles. Many of the learning and teaching activities should be designed to show that in real life the ideas and information learned will need to be adapted because conventions are less stable and more variable than we might think. This is what is meant by flexible competence. By exploring real-life uses in context (where the learner often knows more than the tutor) we can learn how acceptable uses of literacy and numeracy depend on the different purposes, choices and negotiation possible in any situation. The focus on uses in context is important because learners need to be able to draw on their knowledge according to a specific context and purpose. The activities should be designed to promote reflection on the variation in specific real-life tasks so that learners are reacting to questioning, explaining, reasoning and justifying why a real task 'works' or 'doesn't work'. The process of reflection helps learners to make explicit their unconscious knowledge and to begin to use this.

Developing Learners' Understanding

To develop an understanding of literacy and numeracy it is helpful to stand back from working on tasks and take time to reflect on the idea of practices, the ways literacy and numeracy are used in different contexts and the values attached to these uses. It is helpful to be aware that practices change across time and place and between social groups. That is even more true as information and communications technologies rapidly change the way we lead our lives. Developing social and critical awareness enables learners to become more reflective and selfdirecting in their uses of literacy and numeracy. Being able to understand and question who produces the ideas and information in the literacy and numeracy tasks we handle, from whose standpoint these are produced and with what intended effect is crucial to choosing a course of action in the many different roles we play in the knowledge economy and knowledge society. It also means being aware that different social groups have different practices depending on their age, gender, culture, etc so that changing your practices will involve issues of power and identity. Reflecting on this issue of social difference is an important part of deciding the choices any individual wants to make.

Assessment and Accreditation

It is useful to think of on-going assessment (sometimes referred to as 'formative assessment') at various levels: it could be argued that every time a tutor works with a learner or group of learners, he or she is assessing the learners' responses and attitudes to what they are doing; the tutor can make a judgement, for example, on how easily the learner grasps a new concept or skill such as place value or punctuating direct speech, or how he/she makes connections between his existing learning and new learning.

Tutors need to find helpful and easy ways of recording the strengths or difficulties demonstrated by the learners. The learners' folders of work, (particularly when coupled with the tutor's own planning for learning), will provide a significant part of the record as well as providing feedback to the learners themselves.

Tutors will also want to set tasks that bring together aspects of learning and assess what learners can do independently or how they can apply their learning in a new situation or to tackle a problem. The range of work – some collaborative and some individual, some guided and some independent - can enable the tutor to plan future teaching and learning. It can also, at the end of a period of time, enable the tutor to take stock of whether or not a learner is ready to move on to a new level or has in fact, begun to demonstrate capabilities at a higher level, either within a strand of the subject or across the subject as a whole.

To support the tutors in this decision making process, to ensure consistency in the interpretation of standards and to ensure the validity and reliability of what is reported to government, CCEA will provide for use by January 2003, assessment tasks for learners working at entry level. It is important to stress that the tasks are designed as confirmation of the tutor's own judgement. However, because the same tasks can be taken by learners across the province and assessed against externally devised guidance, they will provide Government with a measure of the progress being made to raise the standards in the essential skills of adult learners. They will also provide for the learner, an important statement of the progress he or she has made. They cannot, however, be the only statement. Adults working at this level need continual affirmation of their progress, even when the steps are small. Tutors should continue, therefore, to develop their own ways of affirming learners' achievement and celebrating their progress.

The external tasks will be available to be taken by a learner in his normal learning environment and whenever he/she is ready. They will be based around a theme or a topic so that the skills, knowledge and understanding of the learners can be assessed in an applied way. Each task will be suitably differentiated and the accompanying mark scheme will indicate to the tutor whether on that task, the learner demonstrates achievement in the respective strands or elements (i.e. speaking, listening and responding; writing and reading or number, measures, shape and space and data handling).

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The tasks will also act as exemplars of how the various strands of the respective curriculum can be integrated within a common topic. Guidance will be available to tutors to help them assess the responses of learners, and moderation procedures will also be put in place to ensure that standards are maintained.

From September 2002 to September 2003, **learners working at levels 1 and 2** can have their progress externally endorsed through the existing key skills assessment procedures. The pilot projects have confirmed that following the breadth of the core curriculum can enable the learner to build up a portfolio of work in literacy and numeracy respectively. The successful completion of the portfolio and the successful completion of the associated test will enable the learner to be awarded a full key skill. During 2002-3 CCEA will, in the light of the developments at entry level, review the assessment procedures at levels 1 and 2

Although it is possible to complete the test only and be awarded a basic skills level 1 or level 2 award, tutors are strongly recommended to work with learners to achieving the full key skill at either level 1 or 2.

And finally a word about Information Communication Technology (ICT)

It is stating the obvious to say that the advances in information communication technology (ICT) have loosened the conventional restrictions of time and space to enable us to communicate almost instantly, with people across the globe, to have access to information on any topic at any time and to participate in virtual worlds past present and future. To be literate and numerate in the twenty-first century means being able to communicate and calculate using the new technologies.

The core curriculum makes limited mention of ICT – by which term we mean computers calculators, television, video and radio – but the Department's own ICT strategy is evidence of the importance of technology as a means of communication but also as a crucial learning resource across the ability range and subject disciplines.

Computer assisted learning materials can play an important role in developing an adult learner's literacy and numeracy. In particular, the computer resources can help:

- to motivate learners;
- · to simulate real-life situations and problems;
- to support development of concepts and skills; and
- to provide varied practice of skills and their application.

The computer is also an important medium of communication itself and a vast database of information. Learners need to be able to read and respond to text on screen. It is important to remember that unlike paper-based texts, those on screen require readers to memorise, in the process of reading, the location of the information or text they have read. While books and other paper-based texts are 'corporeal' and have a visible structure, which can be clearly seen, those on screen have an invisible structure, which can cause the poorer reader some disorientation.

Composing on screen also provides opportunity for adults to revisit and reshape their own text. Being able to share it with other readers who can, in turn, respond can help learners to understand how their writing is interpreted by another person. ICT can also enable learners to experiment with text and to explore how layout and graphics help or hinder the clarity of the communication.

The calculator is an important tool in developing numeracy and can help with the process of calculating but also, and more importantly, it can help to expand learning through exploring number,

- to complement mental and written methods of calculation;
- to help to develop an understanding of concepts and skills and
- to enable the learner to focus on problem solving and interpretation of results

Tutors will need to look for opportunities provided by the curriculum to use ICT in these and other ways.

The Adult Literacy Core Curriculum Entry - Level 1

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Speaking and Listening	Reading	Writing
Listen and Respond SLIr/E1 (page 22)	Reading Comprehension: Text Focus Rt/E1 (page 56)	Writing Composition : Text Focus Wt/E1 (page 104)
 Listen for the gist of short explanations Listen for detail using key words to extract some specific information Follow single step instructions in a familiar context, asking for instructions to be repeated if necessary Listen and respond to requests for personal information 	 Follow a short narrative on a familiar topic or experience Recognise the different purposes of text at this level 	 Use written words and phrases to record and present information
 Speak to communicate SLc/E1 (page 24) Speak clearly to be heard and understood in simple exchanges Make requests using appropriate terms Ask questions to obtain specific information Make statements of fact clearly 	Sentence Focus: Grammar and Punctuation Rs/E1 (page 56) Read and recognise simple sentence structures	 Sentence Focus ; Grammar and Punctuation Ws/E1 (page 104) Construct a simple sentence Punctuate a simple sentence with a capital letter and a full stop Use a capital letter for personal pronoun "I"
Engage in discussion SLd/E1 (page 24) Speak and listen in simple exchanges and everyday contexts 	 Word Focus: Vocabulary Rw/E1 (page 58) Process a limited, meaningful sight vocabulary of words, signs and symbols Decode simple regular words Recognise the letters of the alphabet in both upper and lower case 	 Word Focus: Spelling and Handwriting Ww/E1 (page106) Spell correctly some personal key words and familiar words Write the letters of the alphabet using upper and lower case Use basic sound-symbol association to help spelling, as appropriate for the needs of the learner

The Adult Literacy Core Curriculum - Entry Level 2

Speaking and Listening	Reading	Writing
Listen and Respond SLlr/E2 (page 26-28)	Reading Comprehension: Text Focus Rt/E2 (page 62)	Writing Composition: Text Focus Wt/E2 (page 108)
 Listen for and follow the gist of explanations, instructions and narratives Listen for detail in short explanations and narratives Listen and identify the main points of short explanations or presentations Listen to and follow short, straightforward explanations and instructions Listen and identify simply expressed feelings and opinions Respond to straightforward questions 	 Trace and understand the main events of chronological and instructional text Recognise the different purposes of texts at this level Identify common sources of information Use illustrations and captions to locate information 	Use written words and phrases to record or present information
 Speak to communicate Slc/E2 (page 28) Speak clearly to be heard and understood in straightforward exchanges Make requests and ask questions to obtain information in everyday contexts Express clearly statements of fact, and short accounts and descriptions Ask questions to clarify understanding 	 Sentence Focus: Grammar and Punctuation Rs/E2 (page 64) Page 64) Read and understand linking words and adverbials in instructions and directions Use knowledge of simple sentence structure and word order to help decipher unfamiliar words and predict meaning Apply own life experience and knowledge to check out plausible meanings of a sentence as a whole when decoding unfamiliar words Use punctuation and capitalisation to aid understanding 	 Sentence Focus: Grammar and Punctuation Ws/E2 (page 108-110) Construct simple and compound sentences, using common conjunctions to connect two clauses Use adjectives Use a capital letter for proper nouns
 Engage in discussion SLd/E2 (page 30) Follow the gist of discussions Follow the main points and make appropriate contributions to the discussion 	 Word Focus: Vocabulary Rw/E2 (page 66) Read and understand words on forms related to personal information Recognise high frequency words and words with common spelling patterns Use phonic and graphic knowledge to decode words Use a simplified dictionary to find the meaning of unfamiliar words Use initial letters to find and sequence Words in alphabetical order 	 Word Focus: Spelling and Handwriting Ww/E2 (page 110-112) Spell correctly the majority of personal details and familiar common words Use their knowledge of sound-symbol relationships and phonological patterns to help work out correct spellings, as appropriate for the needs of the learner Produce legible text

The Adult Literacy Core Curriculum - Entry Level 3

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Writing	Writing Composition: Text Focus Wt/E3 (page 114)	 Plan & draft writing Organise writing in short paragraphs Sequence chronological writing Proof-read and correct writing for grammar & spelling 	Sentence Focus: Grammar & Punctuation Ws/E3 (page 116) Write in complete sentences Use correct basic grammar Use punctuation correctly Word Focus : Spelling & Handwriting Ww/E3 (page 118)	 Spell correctly common words and relevant key words for work & specialist interest Use developing knowledge of sound-symbol relationships & phonological patterns to help spell wider range of words Produce legible text
Reading	Reading Comprehension: Text Focus Rt/E3 (page 70-72)	 Trace & understand the main events of chronological, continuous descriptive & explanatory texts of more than one paragraph Recognise the different purposes of texts at this level Recognise and understand organisational features & typical language of instructional texts. Identify the main points and ideas, and predict words form context Understand and use organisational features to locate information Skim read title, headings, illustrations to see if material is of interest Contact information Bate to locate information Dutate to locate information 	 Sentence Focus: Grammar & Punctuation Rs/E3 (page 74) Recognise & understand organisational features and typical language of instructional texts Use implicit & explicit knowledge of different types of word to help decode & predict meaning Use punctuation & capitalisation to aid understanding Word Focus : Vocabulary Rw/E3 (page 76) 	 Recognise & understand relevant specialist key words & words Read and understand words and phrases commonly used on forms Use dictionary to find meanings of unfamiliar words Use 1st & 2nd letters to find & sequence words in alphabetical order Use a variety of strategies to help decode increasing range of unfamiliar words
Speaking and Listening	isten and Respond SLIr/E3 (page 32-34)	Listen for and follow gist of explanations, instructions & narratives in different contexts Listen for detail in explanations, instructions & narrative in different contexts Listen for and identify relevant or new information form discussions, explanations, presentations Use strategies to clarify and confirm understanding Listen to and respond appropriately to other points of view Respond to a range of questions about familiar topics	peak to communicate SLc/E3 (page 34-36) Speak clearly to be heard and understood, using appropriate clarity, speed & phrasing Use formal language & register where appropriate Express clearly statements of fact and give short explanations, accounts & descriptions Make requests and ask questions to obtain information in familiar/unfamiliar contexts ngage in discussion SLd/E3 (page 36-38)	Follow and understand the main points of discussions on different topics Make contributions to discussions that are relevant to subject Respect the turn-taking rights of others during discussions

The Adult Literacy Core Curriculum - Level 1

Speaking and Listening	Reading	Writing
 Listen and Respond SLIr/L1 (page 40-42) Listen for and identify relevant information Listen for and understand explanations, instructions and narratives Use strategies to clarify and confirm understanding Provide feedback and confirmation when listening to others Make contributions relevant to situation and subject Respond to questions 	 Reading Comprehension : Text Focus Rt/L1 (page 80-82) Trace and understand main events of continuous descriptive, explanatory and persuasive texts Recognise how language & other textual features are used to achieve different purposes Identify main points & specific detail and infer meaning from images not explicit in text Use organisational and structural features to locate information Use different reading strategies to obtain information 	 Writing Composition : Text Focus Wt/L1 (Page 120-122) Plan & draft writing Judge how much to write and level of detail to include Present information in a logical sequence using Proof-read and revise writing for accuracy and meaning
 Speak to communicate SLc/L1 (page 42-44) Speak clearly in a way which suits the situation Make requests and ask questions to obtain information in familiar/unfamiliar contexts Express clearly statements of fact, explanations, instructions, accounts & descriptions Present information and ideas in a logical sequence and include detail and develop ideas where appropriate 	 Sentence Focus: Grammar & Punctuation Rs/L1 (page 82-84) Use implicit & explicit grammatical knowledge etc to predict and try out possible meaning Use punctuation to help understanding 	Sentence Focus: Grammar & Punctuation Ws/L1 (page 122-124) Write in complete sentences Use correct grammar Punctuate sentences correctly and use punctuation so that meaning is clear
 Engage in discussion SLd/L1 (page 44) Follow and contribute to discussions on a range of straightforward topics Respect turn-taking rights of others Use appropriate phrases for interruption 	 Word Focus : Vocabulary Rw/L1 (page 84) Use reference material to find the meaning of unfamiliar words Becognise and understand vocabulary associated with different types of text, using appropriate strategies to work out meaning Recognise and understand an increasing range of vocabulary, applying knowledge of word structure, related words, word roots, derivations, borrowings 	 Word Focus : Spelling & Handwriting Ww/L1 (page 124) Spell correctly words used most often in work, studies & daily life Produce legible text

The Adult Literacy Core Curriculum - Level 2

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Writing	Writing Composition: Text Focus Wt/L2 (page 126-130)	 Plan & draft writing Judge how much to write and the level of detail to include Present information and ideas in a logical or persuasive sequence, using paragraphs where appropriate Use formal and structure to organise writing for different purposes Use formal and informal language appropriate to purpose and audience Use different styles of writing for different purposes Proof-read and revise writing for accuracy and meaning 	 Sentence Focus: Grammar & Punctuation Ws/L2 (page 130-132) Construct complex sentences Use correct grammar Use pronouns so that their meaning is clear Punctuate sentences correctly and use punctuation accurately 	 Word Focus: Spelling & Handwriting Ww/L2 (page 134) Spell correctly words used most often in work, studies and daily life, including familiar technical words Produce legible text
Reading	Reading Comprehension: Text Focus Rt/L2 (page 90-94)	 Trace and understand the main events of continuous descriptive, explanatory and persuasive texts lidentify the purpose of a text and infer meaning which is not explicit Identify the main points and specific detail Identify the main points and specific detail Read an argument and identify the points of view Read an argument and identify the points of view Read an information, ideas and opinions form different sources Use organisational features and systems to locate texts and information Use different reading strategies to find and obtain information Summarise information from longer documents 	 Sentence Focus: Grammar & Punctuation Rs/L2 (page 94) Use implicit and explicit grammatical knowledge, alongside own knowledge & experience of context, to help follow meaning and judge the purpose of different types of text Use punctuation to help interpret the meaning & purpose of texts 	 Word Focus: Vocabulary Rw/L2 (page 96) Read and understand technical vocabulary Use reference material to find the meaning of unfamiliar words Recognise and understand vocabulary associated with texts of different levels of accessibility, formality, complexity and of different purpose
Speaking and Listening	Listen and Respond SLIr/L2 (page 46-48)	 Listen for and identify relevant information from extended explanations/presentations on a range of topics Listen to, understand & follow lengthy or multi-step instructions & narratives Respond to detailed or extended questions on a range of topics Respond to criticism and criticise constructively 	 Speak to communicate SLc/L2 (page 48-50) Speak clearly & confidently in a way which suits the situation Make requests and ask questions to obtain detailed information in familiar/unfamiliar contexts Express clearly statements of fact, explanations, instructions, accounts, descriptions 	 Engage in discussion SLd/L2 (page 50-52) make relevant contributions and help to move discussions forward adapt contributions to discussions to suit audience, context, purpose & situation use appropriate phrases for interruption or change of topic support opinions and arguments with evidence use strategies intended to reassure

The Adult Numeracy Core Curriculum - Entry Level 1

Handling Data	Data and statistical measures HD1/E1 (page 74)	 Extract simple information from lists Sort and classify objects using a single criterion Construct simple representations or diagrams, using knowledge of numbers, measures or shape and space 	Probability
Measures, Shape & Space	Common measures MSS1/E1 (page 48)	 Recognise and select coins and notes Relate familiar events to: times of the day; days of the week; seasons of the year Describe size and use direct comparisons for the size of at least two items Describe length, width, height, and use comparisons for length, width and height of items Describe weight and use direct comparisons for the weight of items Describe capacity and use direct comparisons for the capacity of items 	 Shape and space MSS2/E1 (page 50) Recognise and name common 2-D and 3-D shapes Understand everyday positional vocabulary (e.g. between, inside near to)
Number	Whole numbers N1/E1 (page 20-22)	 Count reliably up to 10 items Read and write numbers up to 10, including zero Order and compare numbers up to 10, including zero Add single-digit numbers with totals up to 10 Subtract single-digit numbers from numbers up to 10 interpret+,- and = in practical situations for solving problems use a calculator to check calculations using whole numbers 	Fractions, percentages and decimals

The Adult Numeracy Core Curriculum - Entry Level 2

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Handling Data	 Data and statistical measures HD1/E2 (page 76) Extract information from lists, tables, simple diagrams and block graphs Make numerical comparisons from block graphs Sort and classify objects using two criteria Collect simple numerical information Represent information so that it make sense to others 	Probability
Measures, Shape & Space	 Common measures MSS1/F2 (page 52-54) Make amounts of money up to £1 in different ways using 1p, 2p, 5p, 10p, 20p and 50p coins Calculate the cost of more than one item and the change from a transaction, in pence or in whole pounds Read and record time in common date formats Read and understand time displayed in analogue and 12-hour digital clocks in hours, half hours and quarter hours Read, estimate, measure and compare length using common standard and non-standard units Read, estimate, measure and compare veight using common standard and non-standard units Read, estimate, measure and compare capacity using situations such as weather charts Read and compare positive temperatures in everyday situations such as weather charts 	 Shape and space MSS2/E2 (page 56) Recognise and name 2-D and 3-D shapes Describe the properties of common 2-D and 3-D shapes Use positional vocabulary
Number	 Whole numbers N1/E2 (page 24-26) Count reliably up to 20 items Count reliably up to 20 items Read, write, order and compare numbers up to 100 Add and subtract two digit numbers Recall addition and subtraction facts to 10 Multiply using single-digit whole numbers Approximate by rounding up to the nearest 10 Use and interpret +,,x and = in practical situations for solving problems Use a calculator to check calculations using whole numbers 	 Fractions N2/E2 (page 26) Read, write and compare halves and quarters of quantities Find halves and quarters of small numbers of items or shapes

The Adult Numeracy Core Curriculum - Entry Level 3

Number	Measures, Shape & Space	Handling Data
Whole numbers N1/E3 (page 28-30)	Common measures MSS1/E3 (page 58-60)	Data and statistical measures HD1/E3 (page 78)
 Count, read, write, order and compare numbers up to 1000 Add and subtract using three-digit whole numbers Recall addition Multiply two-digit numbers by single-digit whole numbers Recall multiplication facts and subtraction facts up to 20 Divide two-digit whole numbers by single-digit whole numbers and interpret reminders Approximate by rounding numbers less than 100 to the nearest 10 or 100 Estimate answers to calculations Use and interpret +, -, x, ÅÄ and = in practical situations for solving problems 	 Add and subtract sums of money using decimal notation Round sums of money to the nearest £ and 10p and make approximate calculations Read measure and record time Read and interpret distance in everyday situations Read, estimate, measure and compare length using non-standard and standard units Read, estimate, measure and compare weight using non-standard and standard units Read, estimate, measure and compare capacity using non-standard units Read, estimate and standard units Read, estimate measure and compare capacity using non-standard and standard units Read, estimate measure and compare temperature using common units and instruments 	 Extract numerical information from lists, tables, diagrams and simple charts Make numerical comparisons from bar charts and pictograms Make observations and record numerical information using a tally Organise and represent information in different ways so that it makes sense to others
Fractions, decimals and percentages N2/E3 (page 32) Read, write and understand common fractions Recognise and use equivalent forms Read, write and understand decimals up to two decimal places in practical contexts Use a calculator to calculate using whole numbers and decimals to solve problems in context, and to check calculations 	 Shape and space MSS2/E3 (page 60) Sort 2-D and 3-D shapes to solve practical problems using properties 	Probability

The Adult Numeracy Core Curriculum - Level 1

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Handling Data	Data and statistical measures HD1/L1 (page 80)	 Extract and interpret information Collect, organise and represent discrete data Find the arithmetical average for a set of data Find the range for a set of data 	Probability HD2/L1 (page 82)	 Show that some events are more likely to occur than others Express the likelihood of an event using fractions, decimals and percentages with the probability scale of 0 to 1
Measures, Shape & Space	Common measures MSS1/L1 (page 62-66)	 Add, subtract, multiply & divide sums of money & record Read, measure and record time in common date formats and in the 12- hour and 24-hour clock Calculate using time Read, estimate, measure and compare length, weight, capacity and temperature using common units and instruments Read, estimate, measure and compare distance Add and subtract common units of measure within the same system Work out the perimeter of simple shapes Work out simple volume 	Shape and space MSS2/L1 (page 66)	 Solve problems using the mathematical properties of regular 2-D shapes Draw 2-D shapes in different orientation using grids
Number	Whole Numbers N1/L1 (page 34-36)	 Read, write, order and compare numbers, including large numbers Recognise negative numbers in practical contexts Add, subtract, multiply and divide using efficient written methods Multiply and divide whole numbers by 10 and 100 Recall multiplication facts up to 10x10 and make connections with division facts Recognise numerical relationships Work out simple ratio and direct proportion Approximate by rounding Estimate answers to calculations 	Fractions, percentages and decimals N2/L1 (page 38-40)	 Read, write, order and compare common fractions and mixed numbers Find parts of whole number quantities or measurements Recognise equivalencies between common fractions, percentages and decimals and use these to find part of whole-number quantities Read, write, order and compare decimals up to three decimal places Add, subtract, multiply and divide decimals up to two places Multiply and divide decimals up to two places Multiply and divide decimals by 10, 100 Approximate decimals by rounding to a whole number or two decimal places Read, write, order and compare simple percentages, and use simple percentage increase and decrease Find simple percentage increase and decrease Find simple percentage increase and decrease Use a calculator to calculate efficiently using whole numbers, fractions, decimals and percentages

The Adult Numeracy Core Curriculum - Level 2

Number	Measures, Shape & Space	Handling Data
Whole numbers N1/L2 (page 42)	Common measures MSS1/L2 (page 68-72)	Data and statistical measures HD1/L2 (page 84)
 read, write, order and compare positive and negative numbers of any size in a practical context carry out calculations with numbers of any size using efficient methods calculate ratio and direct proportion evaluate expressions and make substitutions in given formulae in words and symbols to produce results 	 calculate with sums of money and convert between currencies calculate, measure and record time in different formats estimate, measure and compare length, distance, weight and capacity using metric, and where appropriate, imperial units estimate, measure and compare temperature, including reading scales and conversion tables calculate with units of measure within the same system calculate with units of measure between systems, using conversion factors understand and use given formulae for finding perimeters and areas of regular shapes understand and use given formulae for finding volumes of regular shapes understand and use given formulae for finding areas of composite shapes understand and use given formulae for finding volumes of regular shapes 	 extract discrete and continuous data from lists, tables, simple diagrams and line graphs collect organise and present discrete and continuous data in tables, charts, diagrams and line graphs find the mean, median and mode, and use them as appropriate to compare two sets of data find the range and use t to describe the spread within sets of data
Fractions, decimals and percentages N2/L2 (page 44-46)	Shape and space MSS2/L2 (page 72)	Probability HD2/L2 (page 86)
 use fractions to order & compare amounts or quantities identify equivalencies between fractions, decimals and percentages evaluate one number as a fraction of another use fractions to add and subtract amounts or quantities order, approximate and compare decimals when solving practical problems add, subtract, multiply and divide decimals up to three places order and compare percentages and understand percentage increase and decrease find percentage parts of quantities and measurements evaluate one number as a percentage of another use a calculator to calculate efficiently using whole numbers, fractions, decimals and percentages 	 recognise and use common 2-D representation of 3-D objects solve problems involving 2-D shapes and parallel lines 	 identify the range of possible outcomes of combined events and record the information using diagrams or tables

Speaking, Listening and Responding.



Speaking and Listening

At the entry level stage, learners develop increasing confidence, precision and confidence to reason, predict, recall and express feelings and ideas. As they move into level 1 they show increasing awareness of the views of others, their questions become more probing and their contribution to discussion more reasoned. They also become more aware of how they can use language, for example, to hurt or amuse, persuade or heal, support or antagonise. They develop greater versatility and consciously adopt their use of language for different purposes and situations - formal as well as conversational. At level 2 their questioning becomes more insightful; they are able to probe argument and evidence and to interpret motives in another's tone of voice and use of language.

Reading

As they move through entry level, learners become more capable of making informed guesses about what they read by making *conscious* use of visual, contextual, syntactic and phonic cues. They learn to make inferences and deductions and develop an understanding of the organisation and structure of texts. As they move into level 1 they are able to distinguish more readily between fact and opinion. They also become able to distance themselves from what they read, to reflect on it and to offer reasoned views. As they progress through level 1 and into level 2, they become more adept at employing different methods of reading for different purposes. They can skim or scan information texts to identify key or relevant points and synthesise the information or represent it for another purpose or audience. They are able to offer a simple critique of what they read.

Writing

As they move through entry level, learners need support to record what they want to say and to transpose their spoken language to its written form. They benefit from strategies to help them both find the written form of their own spoke vocabulary and to organise their thoughts and ideas. As they progress they begin to recognise the need to pay more attention to the structure of what they write; they also evince greater command of the technical features of language and an understanding of how these features contribute to how another reader can make sense of what they have written; their writing also demonstrates more control (sometimes at this stage their focus on secretarial accuracy can inhibit the fluency of their ideas). As they progress towards and into level 2, they show more awareness of how they can adapt and adjust their writing for different purposes and readers, and to achieve different effects. Their writing will manifest more complex grammatical structures and more varied vocabulary.

Learner/Learning Group Profile

Achieveme	nts to date
Literacy	Numeracy
Speaking, Listening, Responding	Number
Reading	Measurement, Shape and Space
Writing	Handling Data

Learner/Learning Group Learning Behaviour

Next	Steps
Literacy	Numeracy
Speaking, Listening, Responding	Number
Reading	Measurement, Shape and Space
Writing	Handling Data



Outcomes
Learning
Intended

_		 	 	
	Evaluation			
	Resources Needed			
	Methods			
	Teaching Points			
	Learning Intended			
	Key activity			
	Time to be afforded			

Learning Objectives

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Using known oral vocabulary to describe facial features:

- to develop and extend spelling and vocabulary through dictionary/thesaurus work.
 consider the bias (complimentary/neutral/insulting) in words and group accordingly.
 write and read short descriptive sentences or paragraphs

aluation																		
Resources Eva		/ drawings	raits	ies	SI											 	 	
Possible	Needed	Pictures	Pen port	Dictionar	Thesauru													
Methods		Mixture of individual,	and group work		Need for learners to	hear, see and write	the words		For some learners,	provide words		Pace and length of	time required will vary					
Teaching Points		Alphabetical order -	use of	dictionary/thesaurus		Consolidation of	vocabulary: grouping	words according to:		similar bias	similar meaning	words associated	with older people etc					
Learning Intended		Consolidation of	ability to write known	words		(Initial sounds;	syllable break down	etc)		Expansion of	vocabulary and	understanding of the	way words can carry	complement or insult	etc			
Key activity		learners to list words	to describe facial	features;		Use thesaurus		e.g hooked nose,	sparking eyes,	freckled face								
Time to be afforded		Minimum 2 sessions																

Methods Resources Needed Evaluation	As above As above		Possible use of ICT Computers		Maximise the value of	writers learning from	how well other	readers interpret their	writing									
	As above		Ordering ideas															
Learning Intended	Consolidation of	vocabulary		Writing for effect e.g.	description that is	favourable or	insulting		Reading one	another's writing for	implied meaning							
Key activity	Learners to use	acquired vocabulary	to write	Simple sentences/	short paragraphs	describing facial	features of self,	others, of 'good and	bad characters etc or	compose 'wanted	posters' or adverts	etc.	-	Share work with one	another and Invite	response (match with	picture; write an	oto (tiontro otio
Time to be afforded	Minimum 3 sessions																	

Extension activity: read some car advertisements; list/develop vocabulary to describe car; write a factual advert (as for classified column in newspaper) write a favourable description; write a negative description; discuss the words that make the difference. Note: it is important to round off each session by e.g. giving opportunity for reflection on what has been achieved or by synthesis of the activities in which learner has been engaged. Here, for example, it might be useful to read together some amusing pen portraits.

The Circle:

An investigation into the relationship between the circumference and the diameter of a circle.

- choose a circular object from those provided.
- alternatively find one of your own choosing.
- using string and measuring tape or ruler, measure the circumference of the object.
- draw around the object on paper and measure its diameter; can you find a method for locating the centre of the circle?
- repeat the above for a variety of circular objects.
- display your results clearly.
- can you find a relationship between C, the circumference and d, the diameter in your findings?

NOTE: THE DEVELOPMENT OF THE LINK BETWEEN TWO MATHEMATICAL FACTS





* THIS TASK HELPS THE LEARNER TO "PROVE" HIS LEARNING BY HAVING TO APPLY IT BUT HE NEEDS BOTH TO COUPLE IT WITH OTHER LEARNING AND TO ADAPT HIS LEARNING ABOUT THE CIRCLE

- A running track has two 'straights' each 68m long and 84m apart which are joined by semicircles as shown.
 Find the length of one lap around the track.
- 2 The diagram shows the dimensions of a model railway track. Find the length of one lap round the track.
- 3 Find the perimeter of the bath shown below.
- 4 From the dimensions given in the picture find the perimeter of the swimming pool.







21 m-

67 m

(4)



The Circle: a practical activity to show that the area of a circle can be found using the formula A= πr^2

- draw a circle of radius 8 cm using compasses.
- cut out the circle.
- fold the circle in half, then in half again, and so on until you have divided it into 16 equal sectors.
- carefully cut out these sectors.
- using glue, stick the sectors onto another piece of paper in such a way that they form a rectangular shape.

NOTE: THE IMPORTANCE OF ARRIVING AT AN UNDERSTANDING OF AN ABSTRACT CONCEPT THROUGH ITS PRACTICAL ACTIVITY.

(although the shape is close to that of a rectangle what is the correct name for it?)

- how can we describe the length of this rectangle in terms of lengths within the circle.
- how can we describe the width of the rectangle, again using dimensions of the circle?
- what can you say about the area of the rectangle and the area of the circle?
- using the general formula for the area of a rectangle and substituting in variables used within the circle, can you arrive at the formula A=πr²
- using a value of r=8cm, use the formula to find the area of your

NOTE: THE PROBING OF THE LEARNER'S THINKING AND THE EMPHASIS PLACED ON GETTING HIM TO ARTICULATE HIS UNDERSTANDING.

circle. Now measure the length and width of your rectangle and calculate its area. How do the two results compare? If there is a difference, what might reason for this be?



Area and perimeter: an activity

- Use the resources provided to design a closed-ended cylinder that can hold up to 20 of the given type of biscuit.
- Find how many of these cylinders you can produce using the sheets of cardboard provided.



- Construct one such cylinder.
- What area of cardboard will be wasted?
- Did you have any difficulties with putting the cylinder together?
- How could you solve these problems and how would it affect the production of the cylinder?
- Could the shape of the biscuit be changed to that of a rectangle of the same area? If so, can you design a suitable container?
- How would this new container compare to the old container in terms of the area of card required to produce it?
- Continue the investigation using different dimensions for the rectangular biscuit. (The surface area of the biscuit should stay the same).
- What shape of biscuit gives the most cost effective use of material?

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