DOCUMENT RESUME

ED 407 590 CE 074 047

TITLE	Working with Learning Outcomes: An Introduction. Draft.
INSTITUTION	Ontario Ministry of Education and Training, Toronto.
PUB DATE	Mar 97
NOTE	134p.
PUB TYPE	Guides - Classroom - Teacher (052)
EDRS PRICE	MF01/PC06 Plus Postage.
DESCRIPTORS	Adult Basic Education; Adult Learning; *Adult Literacy; Adult Students; Behavioral Objectives; Classroom Techniques; Competence; *Competency Based Education; Evaluation Criteria; Foreign Countries; Information Utilization; Instructional Development; *Literacy Education; Numeracy; *Outcome Based Education; Problem Solving; *Student Evaluation; Verbal Communication
IDENTIFIERS	*Canada

ABSTRACT

This booklet, which is intended for literacy practitioners and other educators across Canada, synthesizes the experiences of Literacy Link Eastern Ontario and the Huron-Perth Literacy Committee in working with learning outcomes. After a brief discussion of the booklet's organization, a three-level system of foundation outcomes is proposed as the basis of a learning outcomes-based approach to helping adult students develop basic communications and numeracy skills. Examined next are strategies for getting started with learning outcomes, assessing learners' achievements, and identifying skill gaps and developing individual training programs. The remaining two-thirds of the booklet is a guide to recognizing foundational adult learning based on the following sample communications and numeracy learning outcomes: read with understanding for various purposes; speak and listen effectively; write clearly to express ideas; research and use information; perform basic operations with numbers; use measurement for various purposes; solve geometric problems; manage data and probability; and use patterning and algebra. Suggested demonstrations (tasks instructors can observe learners doing), criteria (statements describing how well or under what conditions outcomes are achieved), and troubleshooting strategies (ideas for helping learners who are experiencing difficulty achieving the learning outcomes) are listed for each learning outcome. (MN)

Working With Learning Outcomes:
An Introduction

DRAFT

Literacy and Basic Skills Section
Workplace Preparation Branch

Ministry of Education and Training

Ontario

Working With Learning Outcomes:
An Introduction

DRAFT

March 1997

What's Inside?

s:\literacy\policy\outcome.doc

1. What is this booklet?

Educators across Canada and Ontario, including literacy practitioners, are increasingly using learning outcomes to describe the achievements of learners at all levels. In Ontario, two approaches were developed by Literacy Link Eastern Ontario and the Huron-Perth Literacy Committee. This booklet is a synthesis of their experience in working with learning outcomes.

Learning outcomes are statements of essential skills, knowledge and behaviours which a learner can demonstrate. They represent significant "chunks" of integrated learning which can be performed, and the attainment of which can be measured and verified.

Literacy practitioners, adult learners, funders, and taxpayers are interested in learning outcomes for many reasons.

- Learning outcomes can assist adult learners to progress more easily by providing a way for programs to document what learners have accomplished which can be recognized by other education and training programs and by employers.
- Learning outcomes can provide a way for programs to recognize the accomplishments of learners from both inside and outside formal education, including from life experience.
- Learning outcomes can enhance the quality of literacy instruction and learning by aiding practitioners and learners to agree on what learning activities are appropriate in order to help learners meet their goals.
- Learning outcomes can provide a common means of documenting learning, a vital element in demonstrating program accountability to funders and taxpayers.

Accountability is particularly important in demonstrating the success of literacy programs in helping learners to achieve their goals. Learning outcomes promote accountability by showing funders the accomplishments of learners and by informing learners of their successes in achieving their goals.

The Ministry of Education and Training (MET) is currently developing a recognition of adult learning strategy (RALS) for literacy programs which is based on learning outcomes. This strategy will be developed and implemented over the next two years as part of the reform of MET's workplace preparation programs.

To prepare for this development, it is important that MET-funded literacy programs begin to try using learning outcomes and to reflect on their successes and challenges. This process will stimulate ideas about additional or alternative ways to work with learning outcomes.

A learning outcomes-based approach is applicable for the following program stages:

- When learners *enter* your program, as you assess their prior learning, assist them to set goals, and develop individual learning plans to achieve these goals.
- *During* your program, as you measure the progress of learners through on-going assessments and as you review their goals with them.
- When learners *leave* your program, as you determine what they have accomplished and document it through conducting end of program assessments.
- When you *review* your program, as you document the effectiveness of instructional activities in order to improve them and to assist in demonstrating your program's accountability.

This booklet provides some basic information and steps for you to get started right away in trying out learning outcomes in these four program stages. In addition, this booklet will be supplemented by province-wide training about a learning outcomes approach. The goal of this training is to explain in a generic sense what learning outcomes are and how they can support the work of literacy programs. The training will be made available in spring, 1997.

For your use, Section 7 of this booklet presents a sample set of learning outcomes for literacy and numeracy at the foundation level. These outcomes were chosen because they address the more basic levels of literacy, which form the focus of most MET-funded programs. They fall within the literacy levels established by the International Adult Literacy Survey (IALS), held in 1994 and published in 1996.

Practitioners in programs which address higher levels, particularly those working in Ontario Basic Skills programs at Levels 3 and 4, may wish to supplement them with the outcomes developed by the Adult Preparatory Programs Articulation and Standards Project (ASP) for all subjects of college preparatory programs. The steps for working with learning outcomes in this booklet apply to the college preparatory outcomes as well.

The foundation and college preparatory outcomes are still works in progress. The foundation outcomes are presented here as examples to assist you in working with a learning outcomes-based approach. Based on your experience, section 6 of this booklet invites you to reflect upon the usefulness and thoroughness of the outcomes presented in Section 7 Your reflections will be helpful in later stages in the development of the recognition of adult learning strategy.

2. Organization of the Foundation Outcomes

A. Types and levels of learning outcomes

As indicated above, the set of foundation outcomes recorded in the Section 7 represents a work in progress. It represents one possible approach for working with learning outcomes. This set is intended to help you to identify different types of learning outcomes at three foundation levels.

Learning outcomes are presented in two major groups:

- Communications, and
- Numeracy

Note: This set of outcomes does not attempt to address computer, social, or employability skills.

The Communications group includes four different types of outcomes:

- Reading;
- Speaking and Listening;
- Writing; and
- Research.

The Numeracy skill path includes outcomes in the following areas:

- Operations;
- Measurement;
- Geometry;
- Data; and
- Patterning.

B. Organization of the learning outcomes

The learning outcomes are broad statements which are supported by demonstrations and criteria for each type and level of outcome. The first page of the statement for each learning outcome lists "Demonstrations" in the first column and "Criteria" in the second column.

Demonstrations are what you can observe a learner doing. Demonstrations should not be completed in isolation, but rather as integral parts of real life tasks.

A variety of demonstrations are listed and briefly described for each learning outcome. Sometimes demonstrations for each type of learning outcome are similar, but they are increasingly more complex at each successive level. For example, demonstrations of "follow instructions" for *Reading* suggest that the learner do the following:

Level 1 — Follow pictorial instructions to complete a practical activity and follow illustrated, written instructions to complete a practical activity

Level 2 — Follow simple written instructions

Level 3 — Follow increasingly complex sets of instructions and directions

Sometimes each successive level suggests different types of demonstrations. For example, the following demonstrations are suggested for successive levels of *Writing:*

Level 1 — Write words, personal and informational texts

Level 2 — Write a short report

Level 3 — Write a persuasive essay

Criteria for each of the learning outcomes are listed in the second column. Criteria describe how well or under what conditions an outcome is achieved. They provide guidance for how to interpret each of the demonstrations in the first column.

Criteria vary according to the type of learning outcome and the level. They generally include the following:

- *Complexity and context of material*
  Each learning outcome has criteria describing the complexity and context of the demonstration material at that particular level

- *Examples of texts, demonstration materials, sources or sample tasks*

Each chart provides guidance for choosing appropriate demonstration materials or tasks at that level, usually with examples.

- *Performance criteria*

  Performance criteria for all Numeracy outcomes include:

  - three pieces of work as evidence;
  - work is legible;
  - uses mathematical signs accurately;
  - answers expressed in appropriate terms;
  - uses appropriate methods or steps to achieve answers; and
  - answers and ideas are expressed accurately.

- *Accommodations*

  For the communications demonstrations, teachers can provide direction, when necessary, for Level 1 demonstrations and can clarify instructions for Level 2 demonstrations. Further accommodations are specified for specific learning outcomes.

The back of the page for each learning outcome has two columns: "Troubleshooting" and "Ideas/Reflections".

Troubleshooting provides examples of a different type which may provide you with ideas when the learner is having difficulty achieving the learning outcome. Some people have referred to these examples as building blocks or embedded skills, related to each outcome.

They are examples, intended as an aid to the instructor. They may be helpful in suggesting something else you may wish to consider. They are not intended to be exhaustive or to represent the necessary skills for a curriculum.

The Ideas/Reflections column provides a place for you to record your own observations and ideas.

3. How to get started with learning outcomes

Learning outcomes can be helpful to learners themselves as well as to literacy practitioners, programs, and funders at four major stages of literacy programming:

- When learners *enter* your program,
- *During* your program,
- When learners *leave* your program, and
- When you *review* your program.

Each of the four stages are discussed in the following sections. Activities are suggested for using a learning outcomes approach in each stage. Suggested activities appear in boldface and they are summarized at the end of each section.

A. When Learners *Enter* Your Program

When learners enter your program, learning outcomes provide you with a focus for assessing what learners already know, the skills they already have relative to their goals. This information about prior learning is essential in order for you and the learner to design an individual learning plan to meet these goals. This process can help you to tailor instruction at the right level, given the skills learners already bring and their interests related to their goals. Learning outcomes can thus help you to be learner-centred in deed as well as in word.

Goal-Directed Assessment : *An Initial Assessment Process*, to be released by the Literacy and Basic Skills Section in 1997, identifies five components in the initial assessment process.

1. Gather background information

   This step involves a one-on-one interview with the learner. You will establish rapport and give learners an opportunity to communicate their needs in a confidential manner. You will discuss the learner's educational and work experiences, identify the learner's transferable skills, identify the learner's preferred learning style, and determine a learner's strengths, challenges, and required supports.

2. Help the learner identify possible long-term and short-term goals

   In this step, you will work with the learner to identify specific and realistic vocational, educational, and personal goals for the long and short term, and to discuss what may be involved in order to reach these goals.

3. Assess the requirements of the learner's goals

In this step, you will determine the specific knowledge, skills, and behaviours required by the learner's goals, using a learning outcomes approach.

For many goals, it will be necessary for the learner to be able to demonstrate skills and achievements in the areas of communications and numeracy.

The following activities are suggested:

Determine the specific knowledge, skills, and behaviours related to communications and numeracy which each goal requires.

For example, a goal like working as a restaurant cashier requires knowledge of basic operations with numbers.

Next, you will want to refer to the foundation level outcomes in the Appendix of this booklet.

Identify and record the communications and numeracy outcomes and demonstrations at the appropriate foundation levels which most closely match the skills required for the learner's goals.

For example, a learner's goal might be to obtain a specific type of job or to enter advanced skill training. Outcomes of instruction might be an ability to research and use information or to use measurement for various purposes. Record the outcomes and specific demonstrations which are appropriate.

4. Assess the learner's achievements

During this step, you will need to determine the learner's current abilities to perform the particular skills required by individual goals. You may wish to consult the foundation learning outcomes when you carry out this determination.

The learning outcomes and demonstrations which you identified as the goal requirements in the above step now become the benchmarks against which you assess the learner's current abilities. You can then design and individual learning plan which addresses the necessary outcomes. As well, the attainment of these learning outcomes can be one way for you to

demonstrate how the learner has benefitted through participation in your program.

From the one-on-one interview, review the background information on the learner's educational and work experiences as well as transferable skills.

Identify, assess, and record the outcomes and demonstrations at the appropriate foundation levels which the learner has already successfully accomplished.

You may need to use, or wish to use, a variety of assessment tools and approaches, from informal interviews to formal tests, in order to establish the outcomes and demonstrations which the learner has accomplished.

There is no need to assess attainment of *every* type of learning. Be selective. Use just those learning outcomes and demonstrations which are relevant to the learner's goals. The learning outcomes approach is intended as an aid. It is not an end in itself. In this way, it can serve as a helpful tool rather than an onerous process.

5. Identify skill gaps and develop an individual training program

After assessing the learner's abilities against those required by the chosen goals, you will then have a list of the learner's skill gaps, or the particular competencies still needed. In this step, you will be in a position to suggest a learning plan based upon the learner's learning needs.

The following activities are suggested:

Create a list of the learner's skill gaps by comparing the list of previous accomplishments of the learner to the outcomes and demonstrations the learner needs to reach their goals.

Together with your learner, create an individual learning plan which dentifies learning activities which address the outcomes and demonstrations the learner needs.

In developing the learning activities, it is important to avoid addressing the learning outcomes and demonstrations as a series of isolated technical exercises — a curriculum in themselves.

As much as possible, incorporate the outcomes and demonstrations in learning activities which are based upon meaningful, real-life tasks. Try to include several learning outcomes and demonstrations in each learning activity.

For example, to adapt a real-life task like reading a job advertisement as a a learning activity you could incorporate demonstrations from communications outcomes, *Read with understanding for various purposes* and *Research and use information.* You could also incorporate a demonstration from the numeracy outcomes, *Perform basic operations with numbers*, if you ask the learner to compute a weekly rate of pay where salary is reported as a yearly figure.

Summary: Using Learning Outcomes When Learners *Enter* Your Program

1. Gather background information

2. Help the learner identify possible long-term and short-term goals

3. Assess the requirements of the learner's goals:

- Determine the specific knowledge, skills, and behaviours required by each goal which relate to communications and numeracy.
- Identify and record the communications and numeracy outcomes and demonstrations at the appropriate foundation levels which most closely match the skills required for the learner's goals.

4. Assess the learner's achievements in relation to these requirements:

- From the one-on-one interview, review the background information on the learner's educational and work experiences as well as transferable skills.
- Identify, assess, and record the outcomes and demonstrations at the appropriate foundation levels which the learner has already successfully accomplished.

5. Identify skill gaps and design an individual training plan:

- Create a list of the learner's skill gaps by comparing the list of completed outcomes and demonstrations to the list of the outcomes and demonstrations the learner needs.
- Together with the learner, create an individual learning plan which identifies learning activities which address the learning outcomes and demonstrations the learner needs.
- As much as possible, incorporate the outcomes and demonstrations in learning activities which are based upon meaningful, real-life tasks. Try to include several outcomes and demonstrations in each learning activity.

Goal-Directed Assessment : An Initial Process provides more information about each of these steps involved in an initial assessment. It also provides a number of specific examples.

B. *During* Your Program

Learning outcomes are particularly helpful as a focus for assessing the progress of learners within your program on an ongoing basis. Learning outcomes will provide learners — and you — with a common language for identifying what the learner has accomplished to date. They want to have evidence of their achievements. Learners want to know where they stand.

Learning outcomes can also help you to identify areas where the learner may be having difficulties. You can then discuss reasons for the difficulties with the learner and determine ways of dealing with them. Is the learner not clear about what to do? Should you try a different instructional technique? Is the learning activity appropriate at this stage?

Ongoing assessment gives you and the learner a means of revising learning goals and adjusting the learner's individual learning plan. For example, when writing is relevant to a learner's goals, you can use a learning outcomes approach to help you identify successive demonstrations of writing at various levels. It can also provide a means of documenting the learner's progress.

Ongoing tracking of a learner's progress is sometimes omitted, but it is a critical component. While it has many elements in common with the initial assessment, it can be much more focused. Assessment should serve as an aid to instruction, not as an end in itself. Be selective. Examine progress on only those learning outcomes which are relevant to the learner's objectives at that particular point.

For you to recognize a learner's attainment of a learning outcome, the learner will need to reliably demonstrate his/her abilities over time and in a variety of contexts. This may mean that you will need to use a variety of assessment tools and approaches.

A key principle with demonstrations of learning outcomes is that they be verifiable. Otherwise, they have no meaning. Demonstrations of learning outcomes may be readily apparent: writing a letter of appreciation to your daughter's teacher, or estimating the amount of floor covering you need for your kitchen.

For other forms of demonstrations, such as listening critically and expressing an opinion, you may have less experience in assessment and the criteria you select may be less obvious. In these situations, you may occasionally ask a colleague independently to assess progress. Do you both come to the same conclusions? If not, the approach to assessment you are using may need to be specified further, or you may need to use it differently.

There are two basic components in ongoing assessment using learning outcomes:

1. Identify the achievements of learners in addressing their learning goals on a regular basis.

   The following activity is suggested:

   Assess progress on the learning outcomes identified in the learner's initial or last assessment. Think and plan for different ways in which a learner could demonstrate her/his attainment of an outcome, and ways in which more than one outcome could be assessed within a given activity.

   As indicated above, this assessment should be focused and need not be as comprehensive as the initial assessment.

   How often should you assess progress? You should allow sufficient time to permit progress to take place. However, it should be frequent enough to provide ongoing motivation and to identify the need for changes to individual learning plans or to particular learning activities. The optimal time interval for assessment will depend upon the nature of your program, the frequency and intensity of instruction, and the needs and progress of each learner.

2. Periodically review the goals of the learner

   From time to time, you should provide an opportunity for the learner to review goals. If the learner has had difficulty, you will want to either revise these goals to make them more realistic, or consider changes to the form of instruction and how it is provided. Are they still appropriate? Upon reflection and experience in the program, is the learner interested in more, or less, ambitious goals? Or perhaps is the learner interested in moving in a different direction?

The following activity is suggested:

Where the goals of the learner change, you will need to revise the individual learning plan and identify appropriate outcomes and demonstrations for communications and numeracy.

Upon entering a program, some individuals may not know for sure what they want to do or what may be realistic for them. People with limited experience of their learning possibilities may not be able to set definitive goals after just one or two sessions.

Summary: Using Learning Outcomes *During* Your Program

1. Identify the achievements of learners in addressing their learning goals on a regular basis:

- Assess progress on the learning outcomes identified in the learner's initial or last assessment. Think and plan for different ways in which a learner could demonstrate her/his attainment of an outcome, and ways in which more than one outcome could be assessed within a given activity.

2. Periodically review the goals of the learner:

- Where the goals of the learner change, you will need to revise the individual learning plan and identify appropriate outcomes and demonstrations for communications and numeracy.

C. When Learners *Leave* Your Program

Learning outcomes can serve as a basis for recognizing learners' accomplishments and skills when they leave your program. As noted earlier, learners want to know what they have accomplished from participation in your program. Using learning outcomes to document the achievements of learners can enable you to demonstrate accountability to the individuals particiating in your program and to funders of your program.

Learning outcomes have been used in some jurisdictions as a common language so that learners' skills are transferable among a range of educational and training programs. For example, the framework for learning outcomes in Section 7 to this booklet is now being used by a number of different programs within Eastern Ontario and Simcoe County. A common approach to learning outcomes can enable learners to bring a document of their achievements when they move from program to program.

Using learning outcomes as a way of identifying the learning which takes place among learners in your program can have important benefits to your program. It can assist you in identifying what approaches work best and improving the effectiveness of what you are doing. It can assist you in documenting that learners have made progress in achieving new skills.

There are two main components to recognizing learning when learners leave your program.

1. Carry out an end-of-program assessment

   The following activity is suggested:

   When learners complete their programs, you should conduct end of program assessments with learners in order to determine their achievements in addressing the outcomes identified in their individual learning plans.

   This step enables you to document the progress which learners have made when they are ready to leave your program. It provides you with an opportunity to discuss with learners how well they have met their goals and how satisfied they are with the learning experience. It can enable instructors to recognize what they have helped to accomplish.

2. Provide recognition for the learning which was completed

   The following activity is suggested:

   For departing learners, provide written documentation of their attainment of learning outcomes related to their goals.

   You can use learning outcomes as a way of providing your departing learners with some form of written document, indicating what they have

achieved. Depending upon how this step is done, learners may be able to use this documentation with other program settings to establish their skills and accomplishments. In this way, learners will be able to avoid unnecessary duplication in the assessment of their skills and in the design of individual learning plans to meet their goals.

Summary: Using Learning Outcomes When Learners *Leave* Your Program

1. Carry out an end-of-program assessment:

- When learners complete their programs, you should conduct end of program assessments with learners in order to determine their achievements in addressing the outcomes identified in their individual learning plans.

2. Provide recognition for the learning which as completed

- For departing learners, provide written documentation of their attainment of learning outcomes related to their goals.

D. When you *review* your program

Working with learning outcomes can assist you in improving your program and in meeting the needs of funders and taxpayers for accountability.

The following activity is suggested:

Survey, document and, review regularly the achievement of learning outcomes of learners in your program as a part of your review of the quality of your program's activities and your approaches to instruction and assessment.

Such a review will enable you to identify what you *have* achieved in your program. It also provides an opportunity to identify areas in which you may wish to make changes in the future. Such a step is an essential aspect of a continuous quality improvement

approach. The information generated in a review of learner achievement is also useful for demonstrating the quality and accountability of your program to funders and taxpayers.

All publicly supported programs must be accountable for the results they achieve. This accountability requires a focus on outcomes, not just on what you do. All programs, including literacy programs, may face criticism if they cannot demonstrate the impact they make on learners.

Use of a learning outcomes approach helps literacy programs meet a number of the Core Quality Standards for Literacy Programs. Your records of learner achievement, using learning outcomes, can be used as evidence that your program is meeting a standard.

The following activity is suggested:

Consider how you can incorporate the evidence of attainment of learning outcomes in your annual report to MET on the Core Quality Standards for Literacy Programs.

There are a number of Core Quality Standards which relate to learning outcomes:

> 3. Program commitment to learners — by indicating that the program fosters improvements in literacy and numeracy skills
>
> 4. Learner commitment to program — by ensuring that learners have set their own goals, and participated in developing an individual learning plan, with a clear understanding of the commitment needed for success.
>
> 5. Respect for learners — by providing a supportive learning environment and giving constructive feedback on learners' achievements
>
> 6. Learner-centred approaches and methods — by taking into account the needs of each learner and enabling learners to take control of their learning
>
> 7. Access and equity — by adapting program approaches to meet the individual needs of each learner
>
> 8. Learning assessment — by carrying out assessment on an ongoing basis
>
> 16. Program accountability — by demonstrating that the program does what it says it will do and meets its commitment to its learners and funders.

Summary: Using Learning Outcomes When You *Review* Your Program

- Survey, document and review regularly the overall achievement of learning outcomes of your learners as a part of your review of the quality of your program activities and instructional approach.
- Consider how you can incorporate the evidence of attainment of learning outcomes in your annual report to MET on the Core Quality Standards for Literacy Programs.

4. Where can you go for more information or assistance?

This booklet is only a starting point to help you think about how you can use learning outcomes in your work as a literacy practitioner. Other resources to assist you in this process are also available.

For example, the Literacy and Basic Skills Section will make training on a learning outcomes approach available to practitioners. This training will explain in a generic sense what learning outcomes are and how a shift to learning outcomes can support the work of programs. The training is expected to be available to literacy practitioners across the province starting in spring, 1997.

The Section will also release a *Goal-Directed Assessment.: An Initial Assessment Process*. This manual describes a five-step process for carrying out initial assessments in order to document what potential learners in literacy programs have already achieved and still need to achieve in order to reach specific goals.

A number of literacy practitioners have worked with earlier versions of the foundation outcomes in Section 7 and with other approaches to learning outcomes and assessment. If you would like to talk with some of these people to learn more about their experiences

with learning outcomes, your regional literacy consultant and the literacy network in your area can help put you in touch with them.

A variety of other related resources are also available. These resources include approaches to learning outcomes and recognition which have been used in other jurisdictions. Your literacy consultant, literacy network, and Alpha Ontario can help you to identify other sources of information which may be of assistance.

5. Development of the foundation outcomes

A number of jurisdictions, including other Canadian provinces, the United Kingdom, the United States, and Australia, have established outcomes for literacy services. In some cases, these have been organized into systems providing for recognition and accreditation of learning transferable across different programs.

The development of common approaches to the identification of learning outcomes is still in the preliminary stage in Ontario. Work has been under way at the foundation and at the college levels.

The Adult Preparatory Programs Articulation and Standards Project (ASP) has developed a framework which identifies standard learning outcomes for all levels and subjects among college preparatory programs. It is intended to provide for the recognition and accreditation of learning.

Progress has also been made in developing an approach at the foundation level. Section 7 of this booklet presents the latest version of this work. This model is attached because it has been developed in Ontario and addresses literacy and numeracy outcomes at the foundation level.

This set of outcomes represents a combination of two approaches originally developed by Literacy Link Eastern Ontario and Huron-Perth. In 1990, Literacy Link Eastern Ontario and the Huron-Perth Literacy Committee independently began to research and develop systems within their regions for developing and recognizing adult learning that takes place within their programs.

After carrying out some initial research with members of the business and training communities, Literacy Link Eastern Ontario formed a working group, with representatives from 16 different community agency, school board, and college literacy programs in its region. It created an Open Learning Network to recognize learning that

takes place in all the literacy programs in its catchment area. It reviewed the applicability to Ontario of work on learning outcomes and recognitions systems which have been developed in other jurisdictions. In particular, it considered the Manchester Open College Network and the ALBSU (Adult Literacy and Basic Skills Unit, England and Wales) Standards for Basic Skills and how these initiatives could be adapted to address the needs of literacy programs in Ontario.

Literacy Link Eastern Ontario used a participatory consultation process involving learners, teachers and administrators in all literacy delivery sectors. Working group members reviewed skills inventories from a variety of learning areas and constructed a model.

The Huron-Perth Literacy Committee represents different types of organizations, including two colleges, two boards of education, and two community agencies. Its members also include other agencies which serve the population in the region. The Committee developed and tested its Recognition for Learning pilot with tutors, learners, and co-ordinators in the region.

This set of outcomes was developed in the Ontario literacy field in response to requests from literacy workers. They wanted a tool which would be applicable to their programs. Learners, teachers, and administrators from all literacy sectors were actively involved in its development and testing.

The groups which assisted in developing the foundation outcomes were looking for a way to communicate and recognize learning outcomes across different program settings. The foundation outcomes are now being used in this way in Eastern Ontario and in Simcoe County. It is too early to say if a revised version of these outcomes could serve as a means for recognizing foundation skills of adults on a broader scale.

Acknowledgements

While the set of learning outcomes presented in Section 7 is based primarily upon the work of Literacy Link Eastern Ontario and the Huron-Perth Literacy Committee. The following organizations also assisted in its development and testing:

- Adult Basic Education - Ottawa Board of Education
- Adult Basic Education Association of Hamilton/Wentworth
- Literacy Network of Durham Region

- Literacy Ontario Central South
- Simcoe County Literacy Network
- Tillsonburg and District Multi-Service Centre
- Mohawk College - Brant Campus
- Laubach Literacy of Ontario

6. Your comments about working with learning outcomes

This booklet has provided some ideas about how you can get started using learning outcomes. The Section 7 provides sample foundation learning outcomes for you to try out. The Literacy and Basic Skills Section would like to hear about your experiences in working with learning outcomes. The Section will share the experiences of literacy programs with others in the literacy community.

You may wish to use the following format to provide your comments.

Please send your comments about the following questions to John Stanley at the Literacy and Basic Skills Section, Ministry of Education and Training.

A. When learners *enter* your program:

1. How were you able to use learning outcomes for the following entry processes: entry assessment, goal-setting, and developing individual learning plans?

2. When using the learning outcomes for these entry processes, which outcomes and demonstrations seemed easiest to relate to your learners' goals and learning plans? Which outcomes and demonstrations were more difficult?

***B. During* your program:**

1. For which learning outcomes might you need to develop new or different instructional approaches and/or assessment activities?

2. Did using the learning outcomes help you to develop more integrated learning activities?

C. When learners *leave* your program:

1. How valid and consistent do you feel your judgments have been about whether learners have attained the outcomes? How could this be improved?

2. When learners left your program, how satisfied do you think they were with what they achieved and how they were assessed? What changes might they like to see?

D. When you *review* your program:

1. How did using a learning outcomes approach help you in evaluating your program in relation to the Core Quality Standards?

2. From your experience, what advice would you give others for using learning outcomes when evaluating a program?

E. General questions:

1. In what ways has this booklet been useful? How could it have been more useful?

2. What additional information and support do you need to make better use of learning outcomes in the various components of your program?

Foundation Outcomes

COMMUNICATIONS

FOUNDATION

LEARNING OUTCOME: ***Read with understanding for various purposes***

READING 1

Demonstrations

❑ ***Read Words***
Read words, symbols, and abbreviations for the completion of daily tasks.

❑ ***Read Signs***
Read and understand community signs, labels and symbols with single messages.

❑ ***Follow Pictorial Instructions***
Follow pictorial instructions to complete a practical activity.

❑ ***Follow Written Instructions***
Follow illustrated, written instructions to complete a practical activity.

❑ ***Read to Find Information***
Find information necessary to community living, using simple resources such as schedules, and directories.

❑ ***Describe Types of Text***
Describe the use of different types of text such as notes, letters, and recipes.

❑ ***Read a Short Text***
Read a short text, applying simple grammatical cues.

❑ ***Read and Retell***
Read and re-tell the contents of a short text.

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and context of material:

- vocabulary and symbols are familiar and taken from everyday life;
- each sentence includes only one message or instruction;
- steps are short, with a maximum of six steps per activity;
- written instructions contain only one step per sentence;
- charts and schedules contain only one type of information;
- all text resources and activities are of strong personal appeal;
- text is in clear, easy-to-read, print or hand-writing, and page layout is well spaced;
- text is a minimum of 2-3 short, simple sentences, and includes illustrations;
- assessment text is no more than one paragraph in length, and is made up of short simple sentences.

Demonstration texts may include:

- language experience writings, simple letters from friends and family, lists, notes, journals, community pamphlets, advertisements, directories, simple maps, recipes, assembly instructions, newspapers, short stories, poems, etc.

Accommodations:

- teacher gives direction when necessary.

COMMUNICATIONS

FOUNDATION

LEARNING OUTCOME: ***Read with understanding for various purposes***

READING 1

Troubleshooting

Language experience:
- Dictates and reads back a language experience story, staying on topic and following a logical sequence.

Decoding skills:
- says the alphabet;
- distinguishes between upper and lower case letters;
- randomly recognizes and pronounces letters of the alphabet and letter combinations;
- pronounces words using a variety of cues (phonics, syntax, context).

Reading Strategies:
- guesses meaning from illustrations and context;
- scans to determine level or interest.

Vocabulary:
- reads from repertoire of common sight words;
- reads sight words in written sequences;
- uses a picture dictionary.

Application of Grammatical Concepts:
- understands that reading proceeds from left to right, top to bottom;
- stops reading at a period;
- identifies capital letters in names and sentences;
- arranges words alphabetically by initial letter.

Literary Forms and Patterns:
- identifies and correctly interprets a variety of common literary patterns used for communication. (i.e., lists, rules, notes, journals, comics, simple poems, stories, etc.).

Comprehension:
- responds to the questions: Who? What? When? in relation to own language experience story;
- acts or reports accurately on the main points of a written passage.

Ideas/Reflections

COMMUNICATIONS

FOUNDATION

READING 2

LEARNING OUTCOME: ***Read with understanding for various purposes***

Demonstrations

❑ ***Select and Read***
Select and read material for personal interest and information.

❑ ***Read Words and Phrases***
Read words and phrases used in daily business.

❑ ***Read to Find Information***
Read to identify and locate information, for a specific purpose, in a variety of printed resources.

❑ ***Follow Instructions***
Follow simple written instructions.

❑ ***Read Documents***
Read structured documents, to understand how information is organised.

❑ ***Read and Form Opinions***
Read a text to form a personal opinion.

31

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and context of material:
- text has personal relevance;
- vocabulary is familiar to the reader;
- most words can be understood in context;
- text is made up of a minimum of 2-3 paragraphs;
- tables and charts are simple, and display only one variable;
- assessments with reference texts should include: pie charts, bar charts, line graphs, pictograms.

Demonstration texts may include:
- short stories, poetry, complex forms, public signs, brochures, flyers, notices, bills, statements, instructions, simple maps, journals, letters, newspaper articles (Ontario Times).

Accommodations:
- teacher clarifies instructions where necessary;
- student may ask about the meaning of words;
- student is encouraged to use a dictionary where necessary.

32

COMMUNICATIONS | FOUNDATION

LEARNING OUTCOME: *Read with understanding for various purposes* | READING 2

Troubleshooting

Decoding skills:
- identifies root words;
- identifies and understands the meanings of prefixes and suffixes;
- uses a dictionary to confirm pronunciation or determine meaning.

Vocabulary:
- reads from a large vocabulary of common sight words.

Reading Strategies:
- skims material to acquire a general understanding of content;
- scans to determine usefulness of material.

Application of Grammatical Concepts:
- identifies and understand the use of common end punctuation;
- reads contractions with understanding;
- reads basic homonyms, and understands the difference in meaning;
- identifies nouns and verbs;
- identifies subject and verb in a simple sentence.

Literary Forms and Patterns:
- identifies a variety of common literary forms;
- explains the difference between fiction and non fiction;
- explains the differences between prose and poetry;
- identifies patterns of rhythm and rhyme in poetry.

Comprehension:
- identifies and applies relevant information from text;
- identifies plot, characters and setting in short stories;
- identifies language that expresses opinion or emotion in text;
- gives an opinion or judgement about a text;
- supports opinion or judgement with reference to text or personal experience.

33

Ideas/Reflections

34

COMMUNICATIONS

FOUNDATION

LEARNING OUTCOME: ***Read with understanding for various purposes***

READING 3

Demonstrations

❑ ***Read to Find Information***
Read to identify and locate useful information in a variety of printed resources.

❑ ***Follow Instructions***
Follow increasingly complex sets of instructions and directions.

❑ ***Read and Interpret***
Interpret information in structured documents and understand how it is organised, for use in daily work.

❑ ***Select Texts***
Locate and select text for a variety of information needs.

❑ ***Read to Identify***
Read a variety of texts to identify underlying assumptions, areas needing clarification, possible exceptions, or limits.

35

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and context of material:
- text is of high personal interest, and is related to the individual's needs;
- assessment tools must contain more complex charts and tables;
- text is a minimum of 2 - 3 pages, and contains a variety of sentence structures;
- language contained in reading materials is formal, and may contain unfamiliar vocabulary;
- materials are current and extracted from "every day" life.

Demonstration texts may include:
- government reports, consumer reports, law books, magazines, daily newspapers, literature.

36

COMMUNICATIONS | FOUNDATION

LEARNING OUTCOME: *Read with understanding for various purposes* | READING 3

Troubleshooting

Develop vocabulary through reading:
- identifies synonyms, antonyms and homonyms;
- identifies idioms and colloquial speech in text;
- routinely uses a dictionary to check meanings of words;
- uses a thesaurus and dictionary to expand vocabulary;
- reads and understands a vocabulary of specialised terms, acronyms and abbreviations.

Apply grammatical concepts to reading by identifying and understanding the use of:
- commas, quotation marks, colon, semi-colon, hyphens;
- subject and predicate;
- pronouns, adjectives, and adverbs;
- standard textual use of parenthesis, italics, underlining and boldface;
- a variety of verb tenses, and the time frame of events;
- stylistic variations in word order and syntax.

Comprehension:
- distinguishes between logical and illogical arguments, objectivity, prejudice;
- recognises, and infers sequences of key events, comparisons and contrast, cause and effect relationships;
- identifies or infers a writer's point of view, attitude, and underlying assumptions;
- uses examples to support predictions, inferences, interpretations;
- recognises how one's own attitude may affect comprehension;
- predicts likely outcomes or sequels of a narrative or exposition.

Literary forms and patterns:
- recognises and understands a variety of literary forms;
- recognises common forms of fiction and non fiction;
- identifies plot, character, setting, conflict and narrator in a short story or novel;
- identifies symbolism, foreshadowing, irony and imagery.

37

Ideas/Reflections

38

COMMUNICATIONS

FOUNDATION

LEARNING OUTCOME: *Speak and listen effectively*

SPEAKING 1

Demonstrations

❑ ***Listen and Re-tell***
Listen to and re-tell stories of personal experience.

❑ ***Converse***
Hold a conversation with one person.

❑ ***Provide Simple Information***
Provide simple information to another individual through speech.

❑ ***Obtain Information***
Obtain information from one other person, through speech.

❑ ***Follow Verbal Instructions***
Follow basic verbal instructions to complete a practical activity.

❑ ***Respond to Questions and Directions***
Respond to questions and directions related to personal interests or activities.

❑ ***Participate in Discussions***
Participate in group discussions on topics of personal interest.

39

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and context of material:
- individuals involved in the communication assessment are known to the student;
- there is a high comfort level with all individuals involved;
- communication situations are based on real-life;
- topics are of strong personal appeal;
- information relayed to another individual concerns only one topic;
- verbal instructions are given one at a time.

Tasks may include:
- describing an activity;
- giving reasons for actions;
- updating someone on progress;
- finding out how to solve problems;
- entertaining someone while waiting for a meeting;
- engaging in conversation while waiting for someone else.

Accommodation:
- teacher gives direction when necessary.

40

COMMUNICATIONS | FOUNDATION

LEARNING OUTCOME: *Speak and listen effectively* | SPEAKING 1

Troubleshooting

Speaking:
- speaks clearly and fluently;
- tells stories, following a logical sequence;
- uses appropriate greetings;
- modulates volume, articulation, body language, and facial expression to fit the situation;
- uses language appropriate to the setting and audience;
- provides information in a sensible order.

Questioning and Listening:
- determines if the person is willing or able to give the desired information;
- asks questions in a sensible order;
- checks own understanding by summarising or questioning appropriately;
- uses information gained for personal needs, or reports on how the information would be used;
- responds appropriately to questions or comments provides input by asking questions or commenting concludes the conversation in an appropriate way.

Instructions:
- responds to instructions in sequence;
- completes each task as requested;
- responds appropriately to question words;
- responds appropriately to spatial instructions e.g., above, below, behind, etc.

Group Discussions:
- contributes ideas;
- stays on topic;
- respects the rules and roles of group discussions.

41

Ideas/Reflections

42

COMMUNICATIONS

FOUNDATION

LEARNING OUTCOME: ***Speak and listen effectively***

SPEAKING 2

Demonstrations

❑ ***Provide Information***
Provide information, on more than one issue to an individual.

❑ ***Obtain Information***
Obtain Information from more than one person.

❑ ***Support and Reassure***
Support and reassure someone in an unfamiliar situation.

❑ ***Converse***
Converse with more than one person.

❑ ***Present***
Present information to more than one person.

❑ ***Listen Critically***
Listen critically to form, and express an opinion.

❑ ***Collaborate***
Contribute collaboratively in a group.

43

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and context of material:
- situations include both face to face, and telephone communication;
- topics include at least two main ideas;
- individuals involved in communication may be strangers;
- situations are based on "real-life."

Tasks may include:
- describing an event;
- planning an event;
- getting price quotes over the telephone;
- finding a baby-sitter;
- helping someone overcome a fear;
- talking to people at a meeting place;
- completing a group assignment.

Accommodation:
- teacher clarifies instructions when necessary.

44

COMMUNICATIONS | FOUNDATION

LEARNING OUTCOME: *Speak and listen effectively* | SPEAKING 2

Troubleshooting

Speaking:

- presents information in a sensible order;
- uses appropriate language;
- uses appropriate volume, articulation, facial expression and body language;
- addresses the entire audience;
- explains the scope and range of the information to be provided;
- answers questions, and gives resources for further information if unable to answer;
- checks the listener's understanding at appropriate times;
- re-phrases and clarify ides that were not clearly understood;
- expresses opinions, justifying them with details and evidence.

Active Listening:

- checks whether the person is willing and able to provide the desired information;
- withdraws or arranges a more appropriate time;
- asks questions in a sensible order;
- asks for clarification;
- applies new information or explain how new information would be used;
- asks for further information where necessary;
- listens attentively, and classifies information;

Interactive and Group Work skills:

- uses appropriate greetings and performs introductions;
- clarifies roles;
- responds to non-verbal cues to end or continue conversation;
- encourages responses from others by questioning appropriately;
- builds on the ideas of others to add to the discussion;
- concludes the conversation appropriately.

45

Ideas/Reflections

46

COMMUNICATIONS

FOUNDATION

LEARNING OUTCOME: ***Speak and listen effectively***

SPEAKING 3

Demonstrations

❑ ***Provide Instructions***
Provide detailed instructions or descriptions, to a group or and individual

❑ ***Research Oral Sources***
Research and apply information from a variety of oral sources.

❑ ***Orally Support an Opinion***
Use information to orally support an opinion.

❑ ***Collaborate***
Collaborate by exchanging information and opinions in a group.

47

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and Context of material:

- explanations or descriptions are about materials which are familiar, or are part of every day work;
- assessments involve groups and individuals;
- assessments involve familiar and unfamiliar individuals;
- at least one presentation is of a formal nature;
- in at least two simulations, the information is gathered from at least two different sources;
- information must be gathered both over the telephone and face to face;
- in group situations, the discussion topic is known in advance;
- the groups are between three and five in size.

Tasks may include:

- explaining what to do in the case of fire, how to use equipment, giving instructions for carrying out an activity or a craft, explaining how to follow a recipe;
- listening to a lecture, planning a holiday, obtaining quotes for a product;
- putting a case to a colleague, supporting or rejecting a change in working conditions, supporting or rejecting a change in arrangements at your local social group, or learning plan;
- meeting with other students to review progress, discuss future plans, plan an event, participate in group discussions about a topic of interest.

48

COMMUNICATIONS | FOUNDATION

LEARNING OUTCOME: *Speak and listen effectively* | SPEAKING 3

Troubleshooting

Speaking
- uses appropriate volume, tone of voice, articulation, body language and facial expression for the situation and the audience;
- uses a vocabulary which is clear and can be understood by the audience.

Explaining or Describing
- provides all necessary information;
- presents information clearly and in a sensible order;
- uses visual aids effectively and appropriately;
- checks for comprehension at appropriate moments;
- answers questions, and solves problems appropriately.

Finding Information
- finds appropriate sources;
- selects relevant information;
- asks questions in a sensible order;
- checks own understanding;
- takes notes when needed;
- applies information to a task, or explains how it would be applied.

Supporting an Opinion
- supports the opinion clearly and coherently;
- justifies the opinion by sensibly supporting the argument with facts and examples;

Communicating within a group
- makes relevant contributions to the discussion;
- listens and responds constructively to other participants;
- uses appropriate vocal and body language to politely disagree.

Ideas/Reflections

50

COMMUNICATIONS

FOUNDATION

LEARNING OUTCOME: ***Write clearly to express ideas***

WRITING 1

Demonstrations

❑ ***Write Words***
Write words for everyday purposes.

❑ ***Complete Forms***
Complete forms requiring only personal information.

❑ ***Write Personal Texts***
Write short texts of personal relevance.

❑ ***Write Informational Texts***
Write letters, notes, messages, and other informal, informational texts.

❑ ***Dictate Texts***
Dictate longer texts about ideas and personal experiences.

51

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and context of material:
- words and phrases are short, familiar, and present in everyday life;
- words are phonetically regular, 1-2 syllables;
- sentences are simple;
- the forms used for assessment are necessary for normal living, and require only name, address, personal details, and very little text;
- forms are only one page in length;
- writing is 2-3 short, simple sentences writing is legible, in type, printing, or cursive.

Tasks may include:
- completing forms;
- completing applications;
- compiling daily lists;
- writing real life messages;
- writing language experience stories;
- writing journals.

Accommodation:
- teacher gives direction when necessary.

52

COMMUNICATIONS | FOUNDATION

LEARNING OUTCOME: *Write clearly to express ideas* | WRITING 1

Troubleshooting

Language Conventions:
- prints and signs own name;
- copies from printed material;
- writes alphabet in upper and lower case letters;
- uses close to standard English spelling;
- writes numbers in symbols and words;
- uses capitals and periods;
- employs a core vocabulary of spelling words in daily writing.

Expressive Writing:
- dictates a language experience story;
- express own ideas in writing.

The Writing Process:
- with assistance, brainstorms and organises ideas for writing;
- dictates, or writes a first draft;
- re-writes corrected material to produce a final copy;
- participates in writing conferences to share work with teachers and peers;
- uses information technology (i.e. word processor) in all stages of the writing process.

53

Ideas/Reflections

54

COMMUNICATIONS

FOUNDATION

LEARNING OUTCOME: ***Write clearly to express ideas***

WRITING 2

Demonstrations

❑ ***Write for Various Purposes***
Write letters, notes and other messages for personal and business purposes.

❑ ***Express Ideas in Writing***
Express ideas, feelings and experiences in various written forms.

❑ ***Write a Report***
Write a short report on a personal interest or work-related topic.

❑ ***Complete Forms***
Complete simple forms, requiring information from a variety of sources.

55

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and context of material:
- writing activities are derived from everyday and working life;
- themes and topics vary;
- paragraphs are simple, at least 5 complete sentences, and develop a main idea;
- vocabulary is familiar and commonly used;
- writing is clear and legible, in type, print, or cursive;
- material for the research report must come from at least two different sources;
- report should be between 250 an 400 words;
- forms require personal details and additional information;
- from a variety of sources, and may require sentences to be written in response to at least one question.

Demonstration texts may include:
- forms, schedules, timetables, lists, messages, notes, point-form directions, public notices;
- reports, jot-notes, learning logs, book reports prose, poetry, journal, creative writings, friendly letters.

Accommodation:
- teacher clarifies instructions when necessary.

56

COMMUNICATIONS | FOUNDATION

LEARNING OUTCOME: *Write clearly to express ideas* | WRITING 2

Troubleshooting

Language Conventions:

- spells correctly with a core vocabulary of words;
- uses common abbreviations;
- uses upper and lower case letters appropriately;
- forms irregular plurals;
- forms new words by adding suffixes to root words;
- identifies nouns and verbs;
- uses pronouns in the place of nouns;
- demonstrates awareness of tense variation (past, present, future);
- identifies subject and predicate in a sentence;
- writes simple sentences and paragraphs;
- composes simple questions.

Compositions and Reports:

- uses a suitable format;
- uses appropriate style or register for a formal or personal responses;
- provide factual content accurately and completely;
- convey the message in a sensible order

The Writing Process:

- begins to edit and revise own writing;
- collects writing samples as a tool to improve writing quality;
- participates in writing conferences with peers and teachers.

57

Ideas/Reflections

58

COMMUNICATIONS

FOUNDATION

LEARNING OUTCOME: ***Write clearly to express ideas***

WRITING 3

Demonstrations

❑ ***Write Expository Paragraphs***
Write expository paragraphs for the purpose of conveying work-related information.

❑ ***Complete Forms***
Complete complex forms requiring paragraph answer.

❑ ***Present Material in Format***
Present material in a specialised format.

❑ ***Write an Essay***
Write a short persuasive essay on a topic related to work or personal interest.

❑ ***Express Ideas in Writing***
Write to express ideas and opinions.

59

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and context of material:
- expository writing contains 3–4 well-organised and logical paragraphs;
- sentences are varied in length and complexity;
- format and tone suits the purpose;
- purpose for writing is clear;
- writing is clear and legible;
- forms are taken from everyday use, including those which require at least a paragraph of information;
- examples of essay styles include: compare and contrast cause and effect, accounts or real or imaginary events, personal reactions;
- compositions are 300 to 500 words in length.

Demonstration texts may include:
- expository paragraphs, "how to" instructions , research projects, charts, logs, planners, tables, social letters, letters of complaint, compositions and essays, forms.

60

COMMUNICATIONS | FOUNDATION

LEARNING OUTCOME: *Write clearly to express ideas* | WRITING 3

Troubleshooting

Language and Writing:

- uses an expanded core vocabulary of spelling words, including specialised vocabulary;
- uses periods, question marks, exclamation points, commas, semi-colons, colons, hyphens, quotation marks and apostrophes;
- demonstrates noun-verb agreement;
- varies sentence structure;
- corrects sentence fragments and run-on sentences;
- writes a paragraph, with topic sentence, supporting details, and concluding sentence in own paragraph;
- uses a variety of resources to check spelling and points of grammar;
- consistently uses the steps of the writing process to produce a polished copy.

Forms:

- obtains information needed to complete the form;
- identifies the person of organisation for whom the form is intended;
- presents the information on the form, clearly and legibly;
- follows directions on how to fill-out the form;
- provides all relevant information clearly and concisely.

Persuasive Writing:

- present factual information accurately;
- includes all essential information;
- presents the document in an appropriate format;
- uses appropriate language and style;
- presents opinions and conclusions logically and coherently;
- supports position or argument with relevant data;
- identifies the relationship between two issues or ideas.

61

Ideas/Reflections

62

COMMUNICATIONS

FOUNDATION

LEARNING OUTCOME: ***Research and use information***

RESEARCH 1

Demonstrations

❑ ***Identify Information Needs***
Identify information needs for daily use.

❑ ***Identify Useful Information***
Identify useful information sources.

❑ ***Report Orally***
Report orally on information obtained.

63

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and context of material:
- topics are relevant to the learner's everyday needs;
- individuals involved are familiar to the learner.

Assessment Activities may include:
- finding a baby-sitter, finding interesting reading material, planning an event.

Sources may include:
- telephone book, radio, video, C.D. ROM, television, encyclopaedia.

Accommodations:
- teacher may assist with location of materials;
- teacher may read materials to the student.

64

COMMUNICATIONS	FOUNDATION
LEARNING OUTCOME: *Research and use information*	RESEARCH 1

Troubleshooting

- expresses an understanding of the importance of learning to locate and use information;
- uses alphabetical order;
- goes to the library to learn about resources available;
- locates departments, organisations and individuals with information on a certain topic of personal importance;
- orally obtains and reports information on a specific topic.

65

Ideas/Reflections

66

COMMUNICATIONS

FOUNDATION

LEARNING OUTCOME: *Research and use information*

RESEARCH 2

Demonstrations

❑ ***Consult a Reference***
Consult a reference source to obtain a specific item of information for work of personal purposes.

❑ ***Research Information***
Research background information for a report.

❑ ***Obtain Lecture Information***
Obtain information from a live talk or lecture.

❑ ***Obtain Recorded Information***
Obtain information from a radio or T.V. broadcast or tape recording.

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and context of material:
- reference materials are alphabetically structured, or contain an alphabetical index, and clear instructions on how to use it;
- the information is mainly textual;
- tables have at least two variables and require reference to additional sources or keys to provide the item of information required;
- the information may need to be extracted from more than one table;
- lecture situation may be formal;
- lecture topic and recordings will be familiar, or from specialist area.

Sources may include:
- dictionaries, encyclopaedias, car manuals, yellow pages;
- timetables, conversion tables, price lists, planner charts;
- textbooks, newspapers, non-fictional material, interview an expert on the subject;
- team or company briefings, guided tours, presentations at local colleges or community groups;
- C.D. ROM, Internet.

Accommodation:
- teacher clarifies instructions when necessary.

COMMUNICATIONS | FOUNDATION

LEARNING OUTCOME: *Research and use information* | RESEARCH 2

Troubleshooting

Textual:

- locate information;
- skim and scan for information;
- breaks text into manageable units;
- extracts information from tables;
- makes notes at appropriate times;
- indicates references;
- uses quotation marks appropriately.

Oral:

- listens for important information;
- takes notes effectively;
- reports accurately on the main points of an oral presentation;
- takes appropriate action on the main points of the presentation.

69

Ideas/Reflections

70

COMMUNICATIONS

FOUNDATION

LEARNING OUTCOME: ***Research and use information***

RESEARCH 3

Demonstrations

❑ ***Consult References***
Consult reference systems to find materials for a particular purpose.

❑ ***Research to Support***
Research information to support an argument.

❑ ***Create a Reference System***
Create a reference system for a particular purpose.

71

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and context of material:

- reference material is stored in a variety of ways including in an alphabetical index, in a numbering system, or in a system which involves both;
- reference material is useful for a specific purpose;
- an alphabetical, numerical or date order filing system is provided for the learner's use;
- materials to be organised are from everyday situations, or from specialist area;
- tables or schedules require cross referencing to find specific information.

Sources may include:

- library catalogue systems, office filing systems, database, postal code directory, yellow pages;
- organise study notes, records of household bills, address or telephone book, school filing system.

72

COMMUNICATIONS | FOUNDATION

LEARNING OUTCOME: *Research and use information* | RESEARCH 3

Troubleshooting

Textual Skills:

- skims and scans for information;
- finds the material required;
- breaks information into manageable units of information;
- uses note-taking;
- uses headings and subheadings to organise information;
- makes judgements on the accuracy and reliability of information found;
- edits research material;
- takes appropriate action or reports accurately on the information; obtained from the source;
- organises material accurately into a given system;
- retrieves material when needed;
- finds information about at least two specifics, from tables and schedules;
- interprets the meaning of information found in maps, tables and charts;
- reports on how information might be used in a practical manner;
- reports on how you might apply this information in another similar situation.

73

Ideas/Reflections

74

NUMERACY

FOUNDATION

LEARNING OUTCOME: ***Perform basic operations with numbers***

OPERATIONS 1

Demonstrations

- ❑ ***Write Numbers***
  Write numbers for everyday use.
- ❑ ***Count***
  Count for everyday purposes.
- ❑ ***Apply Place Value***
  Apply an understanding of place value in operations with whole numbers.
- ❑ ***Construct Fractions***
  Construct and describe fractions using everyday materials.
- ❑ ***Add and Subtract***
  Add and subtract whole numbers for everyday and business purposes.
- ❑ ***Multiply and Divide***
  Multiply and divide using everyday materials and activities.
- ❑ ***Add and Subtract Mentally***
  Add and subtract mentally.
- ❑ ***Estimate***
  Estimate for daily problem solving.
- ❑ ***Use a Calculator***
  Use the calculator as a mathematical tool.
- ❑ ***Select Operation***
  Select the appropriate operation in daily problem solving.

75

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and context of material:

- concrete learning aids are used;
- problems are based on real-life experience and personal needs, such as managing money in every day life;
- student uses numbers up to three digits.

Sample Assessment Activities:

- make change;
- add up prices;
- calculate personal weight loss or gain;
- add monthly bills;
- estimate grocery costs;
- budgeting;
- change a recipe from 2 serving to 10 servings.

Performance Criteria:

- there are three pieces of work as evidence;
- work is legible;
- uses mathematical signs accurately;
- answers expressed in appropriate terms;
- uses appropriate methods or steps to achieve answers;
- answers and ideas are expressed clearly.

76

NUMERACY | FOUNDATION

LEARNING OUTCOME: *Perform basic operations with numbers* | OPERATIONS 1

Troubleshooting

- reads and writes numbers to 999;
- reads and prints number words to 100;
- demonstrates number meanings though everyday experiences;
- compares and orders whole numbers;
- counts by 2s 5s and 10s up and down from 100;
- represents two and three digit numbers concretely and pictorially;'
- names and renames quantities to 999 (e.g. 32 as 3 tens and 2 ones, etc.);
- uses place value to order three digit numbers;
- represents simple fractions (with denominators not more; than 10) concretely, pictorially and in written form;
- compares two simple fractions with the same denominator using concrete materials;
- represents equivalent fractions using concrete materials;
- writes an amount of money using decimal notation;
- represents decimals to tenths using concrete materials.
- adds and subtracts amounts of money using decimal notation;
- recalls basic addition and subtraction facts;
- recalls basic multiplication facts up to 5 x 5;
- recalls basic division facts up to 25 5
- uses personal strategies to recall basic number facts;
- adds and subtracts two and three digit numbers with and without regrouping;
- solves multiplication and division sentences;
- uses multiplication and division in problem solving activities;
- uses estimation strategies to solve problems and to check if results are reasonable;
- uses mental calculation strategies;
- uses a calculator in appropriate circumstances;
- uses a calculator to perform operations, examine number relationships and solve problems;
- identifies and uses the basic operation required to solve a one-step problem;
- solves problems involving more than one operation.

77

Ideas/Reflections

78

NUMERACY

FOUNDATION

LEARNING OUTCOME: ***Perform basic operations with numbers***

OPERATIONS 2

Demonstrations

❑ ***Identify Uses of Fractions***
Identify uses of fractions in everyday life.

❑ ***Solve Problems***
Solve one and two-step problems based on everyday situations using whole numbers, and fractions.

❑ ***Demonstrate Place Value***
Demonstrate an understanding of place value in operations with money.

❑ ***Select Calculation Method***
Choose the appropriate calculation methods for solving daily problems.

❑ ***Estimate***
Estimate for daily problem solving activities.

❑ ***Identify the Uses of Concepts***
Identify everyday uses of the concepts of percent, ratio and rate.

79

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and Context of material:
- repetition of arithmetic questions are used to help build skills, but are used in conjunction with problems that are extracted from everyday life
- all written answers must be organised
- the student poses and solves problems used in everyday life situations
- materials should be of high personal interest

Sample Assessment Activities:
- estimate costs;
- make a budget;
- write cheques;
- fill-out deposit;
- withdrawal slips;
- balance a budget;
- interpret a map;
- mathematical problems that come up in daily life;
  - break down a budget;
  - schedule into a pie chart.

Performance Criteria:
- there are three pieces of work as evidence
- work is legible
- uses mathematical signs accurately
- answers expressed in appropriate terms
- uses appropriate methods or steps to achieve answers
- answers and ideas are expressed clearly

80

NUMERACY | FOUNDATION

LEARNING OUTCOME: *Perform basic operations with numbers* | OPERATIONS 2

Troubleshooting

Fractions:

- identifies and uses the terms numerator and denominator;
- reduces fractions to lowest terms;
- compares fractions with unlike denominators using (+, -, =);
- adds and subtracts fractions with like and unlike denominators;
- subtracts mixed fractions with and without re-grouping;
- illustrates improper fractions using concrete materials;
- divides fractions by whole and mixed numbers;
- divides whole and mixed numbers by fractions.

All operations:

- solves two-step problems using whole numbers and fractions;
- performs basic operations;
- demonstrates an understanding of place value by using it effectively to read and write numbers, to estimate and to calculate;
- quickly recalls multiplication and division facts to 100;
- solves operations with four digit numbers;
- uses mental calculation effectively;
- uses a variety of estimation techniques effectively;
- uses a calculator effectively;
- chooses the most appropriate calculation method from among mental mathematics, estimation, calculator or paper and pencil procedures;
- represents percents pictorially, as parts of a whole (e.g.,. pie chart).

81

Ideas/Reflections

82

NUMERACY

FOUNDATION

LEARNING OUTCOME: ***Perform basic operations with numbers***

OPERATIONS 3

Demonstrations

❑ ***Identify the Uses of Decimals***
Identify uses of decimals in everyday life.

❑ ***Identify the Uses of Percents***
Identify uses of percents in everyday life.

❑ ***Identify the Uses of Integers***
Identify uses of integers in everyday life.

❑ ***Identify the Uses of Rate and Ratio***
Identify uses of ratios and rates in everyday life.

❑ ***Identify the Uses of Exponents***
Identify uses of exponents and square roots in everyday life.

❑ ***Select Calculation Method***
Use appropriate calculation methods in everyday problem solving activities.

❑ ***Solve Problems***
Solve everyday problems involving whole numbers, decimals, percents, integers, ratio and rate, exponents and square roots.

❑ ***Estimate***
Use estimation and mental calculation to make decisions about situations in everyday life.

❑ ***Judge***
Judge the reasonableness and accuracy of numeric information in daily problem solving.

83

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and context of material:
- repetition of arithmetic questions is used to help build skills, but it is used in conjunction with problems that are extracted from every day life;
- materials are of high personal interest.

Sample Assessment Activities:
- banking;
- evaluating mortgage rates;
- calculating compound interest;
- estimating materials required for craft or construction project;
- determining rates of pay, shift premiums, increases and bonuses;
- calculating proportional increases in size charts (enlarge a pattern).

Performance Criteria:
there are three pieces of work as evidence work is legible:
- uses mathematical signs accurately;
- answers expressed in appropriate terms;
- uses appropriate methods or steps to achieve answers;
- at least 80% accuracy;
- answers and ideas are expressed clearly.

84

NUMERACY | FOUNDATION

LEARNING OUTCOME: *Perform basic operations with numbers* | OPERATIONS 3

Troubleshooting

Decimals:
- understands the relationship of decimals to whole numbers;
- reads, orders and expresses decimals;
- changes decimals to fractions and vice versa;
- understands the use of zero when writing decimals;
- applies place value to decimals;
- orders and compares decimals;
- performs operations with decimals;
- applies decimals to problems in everyday life.

Per Cent:
- recognise percent and what it means;
- changes percent to fractions and vice versa;
- interprets "percent of" as multiplication by percent;
- rounds percents to two decimals;
- finds what percent one number is of another number;
- finds a number when the percent is known.

Integers:
- understands the concept of positive and negative integers;
- performs all four operations with integers, using the order of operations.

Ratios:
- defines ratio as the comparison of two sets of numbers;
- identifies and calculates ratio and proportion from given numbers.

Exponents and Roots:
- identifies exponents and explains what they mean;
- expands and contracts exponents;
- evaluates mathematical statements containing exponents;
- identifies and explains the meaning of square roots;
- recalls the square roots of perfect squares up to 144;
- uses a calculator to evaluate the square roots of imperfect squares.

Problem solving:
- chooses from a variety of calculation methods to solve a problem;
- Understands and consistently follows the Order of Operations (BEDMAS);
- uses estimation strategies to check reasonableness of the results of calculation;
- uses a variety of methods of mental calculation;
- uses a calculator correctly and efficiently for calculation.

Ideas/Reflections

NUMERACY

FOUNDATION

LEARNING OUTCOME: *Use measurement for various purposes*

MEASUREMENTS 1

Demonstrations

❑ ***Identify Examples of Measurement***
Identify examples of measurement in everyday life.

❑ ***Estimate and Compare***
Estimate and compare in everyday measurement activities.

❑ ***Measure Distance***
Measure linear distances in daily life.

❑ ***Measure Mass***
Measure mass in real-life activities.

❑ ***Measure Capacity/Volume***
Measure capacity/volume in real-life activities.

❑ ***Measure Time***
Measure time in daily life.

❑ ***Measure Temperature***
Measure temperature in daily life.

❑ ***Record Results***
Record the results of measurement activities for a variety of purposes.

❑ ***Solve Problems***
Use measurement to solve everyday problems.

87

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and Context of Material:
- measurements are in standard and non-standard units;
- measurement activities have relevance to everyday life;
- activities are of interest or use to the student.

Sample Assessment Activities:
- locate clocks, scales, measuring cups, find the distance from school to home, measure weight loss or gain, estimate the amount of meat needed for one meal, add milk to a recipe, add gas to a gas tank, keep track of body temperature, plan a day trip itinerary, cook a meal for six people, decorate a room.

Performance Criteria:
- there are three pieces of work as evidence;
- work is legible;
- uses mathematical signs accurately;
- answers expressed in appropriate terms;
- uses appropriate methods or steps to achieve answers;
- answers and ideas are expressed clearly.

88

NUMERACY | FOUNDATION

LEARNING OUTCOME: *Use measurement for various purposes* | MEASUREMENTS 1

Troubleshooting

- finds measurement concepts in many aspects of daily life;
- uses comparison to gather information about the environment;
- distinguish between imperial and metric measurement;
- distinguishes between making a "wild" guess and making an estimate based on past experience;
- uses previous estimates to predict the results of measurement activities as accurately as possible;
- explains the need for a common unit of measurement;
- estimates and measures length in metres and centimetres;
- estimates and measures mass in kilograms and grams;
- estimates and measures capacity in litres and millilitres;
- estimates and measures time in five-minute intervals;
- reads analogue and digital clocks;
- estimates and measures temperature in degrees Celsius;
- judges when to use larger or smaller measurement units;
- measures perimeter;
- measures and compares area using non-standard units;
- records results of a measurement task independently.

89

Ideas/Reflections

90

NUMERACY

FOUNDATION

LEARNING OUTCOME: *Use measurement for various purposes*

MEASUREMENTS 2

Demonstrations

❑ ***Estimate and Measure***
Use a variety of tools to estimate and measure length, perimeter, area, capacity, volume, mass, time and temperature using standard units, in everyday problem-solving activities.

❑ ***Apply Measurement Formulae***
Apply simple measurement formulae to solve simple, everyday. problems

❑ ***Compare Using Metric***
Use various metric units to compare the measurements of objects.

❑ ***Solve Problems***
Use measurement, estimation and to solve problems in everyday life.

91

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Context and Complexity of Material:
- units of measurement are standard;
- assessment activities are taken from everyday life.

Suggested Assessment Activities:
- measure the length, width, perimeter of a table, estimate and select amounts of food at a deli counter, double or triple a recipe, calculate volume of water in a fish tank, calculate volume of cement needed to pave a sidewalk, chart seasonal temperature changes.

Performance Criteria:
- there are three pieces of work as evidence;
- work is legible;
- uses mathematical signs accurately;
- answers expressed in appropriate terms;
- uses appropriate methods or steps to achieve answers;
- answers and ideas are expressed clearly.

92

NUMERACY	FOUNDATION
LEARNING OUTCOME: *Use measurement for various purposes*	MEASUREMENTS 2

Troubleshooting

- chooses appropriate tools for measurement;
- measures with precision;
- measures length, perimeter, area, volume, capacity, mass and temperature using standard units;
- compares everyday objects when estimating measurements;
- determines the usefulness of comparisons in estimation activities;
- identifies the difference between estimation and precise measurement;
- judges the reasonableness of the estimate in measurement activities;
- estimates and measures the perimeter and area of irregular figures using standard and non-standard units;
- uses correct units and performs a required calculation, when given the required formula;
- apply ratios when given the formula;
- uses the prefixes in the metric system correctly;
- makes simple metric conversions;
- uses a calculator in calculating measurements.

93

Ideas/Reflections

94

NUMERACY

FOUNDATION

LEARNING OUTCOME: *Use measurement for various purposes*

MEASUREMENTS 3

Demonstrations

❑ ***Estimate and Measure Using Various Tools***
Use a variety of strategies, units and tools to estimate and measure length, perimeter, area, volume, angles capacity, and mass in everyday.

❑ ***Construct***
Construct regular and irregular figures using a variety of materials.

❑ ***Estimate and Measure Perimeter***
Estimate and measure the perimeters and areas of irregular figures in the environment, using a variety of techniques.

❑ ***Solve Problems using Formulae***
Apply formulae in work-related measurement activities, and problem solving.

95

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Context and Complexity of Material:
- examples of measurement are taken from everyday life;
- student performs activities independently, using formulae.

Sample Assessment Activities:
- estimate the measurements of food that are needed at a deli, measure for verification. set-up a fish tank, re-decorate a room, build a miniature object to scale, plan a meeting or trip itinerary.

Performance Criteria:
- there are three pieces of work as evidence;
- work is legible;
- uses mathematical signs accurately;
- answers expressed in appropriate terms;
- uses appropriate methods or steps to achieve answers;
- answers and ideas are expressed clearly.

96

NUMERACY | FOUNDATION

LEARNING OUTCOME: *Use measurement for various purposes* | MEASUREMENTS 3

Troubleshooting

Estimation:
- recognises when measurement or estimation is more appropriate;
- estimates and judges the reasonableness of the estimate, using appropriate units;
- selects appropriate units, and converts from one unit to another with accuracy.

Construction:
- constructs or illustrates regular two-dimensional figures with a given perimeter using a variety of materials and tools;
- constructs regular three dimensional figures with a given area/volume.

Measurement:
- estimates and measures the perimeter of irregular two dimensional figures (e.g., race track);
- estimates and measures the area of irregular two-dimensional figures;
- converts from metric to imperial measurements, and from imperial to metric;
- makes simple and complex metric conversions;
- applies ratios to measurement.

Use Formulas:
- applies formulas to determine the perimeter and the area of rectangles, triangles, parallelograms, and trapezoids;
- develops and applies formulas for the circumference of a circle, area of a parallelogram, trapezoid, and circle;
- applies formulas for the surface area of a prism, pyramid, and cylinder;
- applies formulas for the volume of a prism.

97

Ideas/Reflections

98

NUMERACY

FOUNDATION

LEARNING OUTCOME: *Solve geometric problems*

GEOMETRY 1

Demonstrations

❑ ***Identify and Compare***
Identify and compare two-dimensional and three-dimensional shapes and figures at home and in the community.

❑ ***Construct in Two Dimensions***
Construct two-dimensional figures, as they would be found in everyday life.

❑ ***Construct in Three Dimensions***
Construct real-life three dimensional structures.

❑ ***Create Patterns***
Create two and three dimensional patterns, for real-life purposes.

❑ ***Use Geometric Language***
Use geometric language to explain movements that take an object and people from one position to another.

❑ ***Solve Problems***
Solve real-life geometric problems using concrete materials.

❑ ***Apply Grids***
Apply grid applications to games and investigations.

99

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Context and Complexity of Materials:
- materials are mostly concrete;
- student describes geometric shapes in own terms, using some mathematical language;
- a calculator is used for calculations.

Sample Assessment Activities:
- locate shapes of traffic signs;
- locate shapes found on a house;
- build a model house using shapes already provided;
- construct a paper village in three dimensions;
- play battle-ship.

Performance Criteria:
- there are three pieces of work as evidence;
- work is legible;
- uses mathematical signs accurately;
- answers expressed in appropriate terms;
- uses appropriate methods or steps to achieve answers;
- answers and ideas are expressed clearly.

100

NUMERACY | FOUNDATION

LEARNING OUTCOME: *Solve geometric problems* | GEOMETRY 1

Troubleshooting

Identify:
- sorts and re-sorts items according to geometric shape;
- groups objects according to two geometric criteria;
- finds, labels and compares shapes found in the environment;
- defines in own language the terms; dimensions, face, edge, vertices, symmetry, pattern, strength, and stability;
- describes similarities and differences in three dimensional structures.

Construct:
- builds a three-dimensional structure using a variety of materials and names the three-dimensional shapes used;
- builds a three-dimensional structure and describes in own language how symmetry, pattern ,strength and stability are reflected in it;
- continues two-dimensional patterns and names the basic shapes used.

Create:
- creates two- and three-dimensional patterns using at least three shapes.

Transformations:
- demonstrates slides, flips and turns using movements of objects;
- describes location of points on a grid or map;
- describes how to get from one point to another on a grid.

101

Ideas/Reflections

102

NUMERACY

FOUNDATION

GEOMETRY 2

LEARNING OUTCOME: ***Solve geometric problems***

Demonstrations

❑ ***Construct***
Measure angles for the purpose of construction.

❑ ***Identify and Represent Lines***
Identify and compare two-dimensional and three-dimensional shapes and figures at home and in the community.

❑ ***Use Symmetry***
Use symmetry in the construction real-life two-dimensional and three-dimensional figures.

❑ ***Use Co-ordinate Systems***
Use co-ordinate systems to complete daily tasks.

❑ ***Apply Transformations***
Apply slides, flips, and turns in the creation of a pattern or everyday purposes.

❑ ***Model 3-D Structures***
Model real-life three-dimensional structures from different perspectives.

103

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Context and Complexity of Material:
- activities and materials are extracted from everyday life;
- student uses proper geometric terms when describing.

Sample Assessment Activities:
- construct a bird house, or doll house;
- measure for wallpaper and carpet;
- measure for fence-post holes;
- plans a shopping trip using a map and grid;
- assemble a patchwork quilt using various shapes.

Performance Criteria:
- there are three pieces of work as evidence;
- work is legible;
- uses mathematical signs accurately;
- answers expressed in appropriate terms;
- uses appropriate methods or steps to achieve answers;
- answers and ideas are expressed clearly.

104

NUMERACY | FOUNDATION

LEARNING OUTCOME: *Solve geometric problems* | GEOMETRY 2

Troubleshooting

- selects the proper tools when asked to measure or construct angles;
- uses a protractor to measure and construct angles;
- estimates angle size within a 5 degree range;
- describes the properties of two and three dimensional figures using appropriate language;
- demonstrates knowledge of types of angles, by explaining verbally, and in writing;
- classifies angles by size;
- constructs three-dimensional objects from given descriptions;
- creates two- and three- dimensional figures and objects that have mirror symmetry;
- classifies shapes according to given criteria.
- reads simple maps;
- plots points in a co-ordinate system;
- measures angles and side length to prove congruency;
- proves figures are congruent;
- constructs patterns and designs using slides, flips, and turns;
- locates slides, flips, and turns in patterns and designs in the environment;
- visualises and predicts the effects of slides, flips, and turns singly and in combination;
- solves everyday problems involving geometric concepts;
- describes the occurrence or application of geometric properties and principles in the real world and in other subjects.

105

Ideas/Reflections

106

NUMERACY

FOUNDATION

LEARNING OUTCOME: *Solve geometric problems*

GEOMETRY 3

Demonstrations

❑ ***Construct***
Complete everyday construction tasks using a variety of tools and techniques.

❑ ***Identify and Represent***
Identify and represent intersecting, parallel and perpendicular lines as found in everyday structures.

❑ ***Represent Transformations***
Use a variety of everyday tools and materials to represent properties of translations, reflections, rotations and dilations.

❑ ***Use Co-ordinate Geometry***
Use co-ordinate geometry to plot plans and drawings for use in everyday life.

❑ ***Make Scaled Drawings***
Make scaled drawings to use in everyday life.

107

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Complexity and Context of Material:
- may need some direction for construction;
- student uses mathematical language for description;
- activities and materials are extracted from everyday life;
- technology is used where possible.

Sample Assessment Activities:
- design a geometric quilt, and assemble it;
- create a pattern for sewing a simple garment;
- creating a pattern for printing;
- draw plans for the re-arrangement of furniture in the room;
- draw a map to scale;
- assemble a bird house;
- assemble a model from a kit;
- draw plans to build a dog house.

Performance Criteria:
- there are three pieces of work as evidence;
- work is legible;
- uses mathematical signs accurately;
- answers expressed in appropriate terms;
- uses appropriate methods or steps to achieve answers;
- answers and ideas are expressed clearly.

108

NUMERACY | FOUNDATION

LEARNING OUTCOME: *Solve geometric problems* | GEOMETRY 3

Troubleshooting

- follows a construction plan;
- selects appropriate tools for measurement and drawing;
- selects appropriate tools for construction;
- explains geometric terms and concepts, such as dimensions, congruency, line symmetry, rotational symmetry, angle properties, intersection, parallel, and perpendicular;
- identifies and classifies geometric figures and describes their properties in mathematical language;
- identifies and describes slides, flips, turns, and dilations of two dimensional shapes using mapping;
- identifies angle properties of intersecting parallel and perpendicular lines;
- solves problems using the angle properties of intersecting, parallel and perpendicular lines;
- creates regular figures that will tile a plane;
- sketches three-dimensional figures on isometric dot paper;
- builds models from drawings of top, side and front views of three-dimensional figures;
- sketches top, side and front views from three dimensional objects.

Ideas/Reflections

NUMERACY

FOUNDATION

LEARNING OUTCOME: ***Manage data and probability***

DATA 1

Demonstrations

❑ ***Collect Information***
Collect information to answer an everyday question.

❑ ***Organise Results***
Organise the results of a questionnaire using graphs.

❑ ***Interpret Graphs***
Interpret simple graphs and containing everyday information.

111

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Context and Complexity of Materials:
- information gathered by students is easily fond in the environment and is part of everyday life;
- interviewees are familiar to the student;
- activities are of personal interest;
- assistance may be given to gather survey information.

Sample Assessment Activities:
- construct graphs and charts on the ages of the students' children;
- graph information related to household expenses;
- board and dice games.

Performance Criteria:
- there are three pieces of work as evidence;
- work is legible;
- uses mathematical signs accurately;
- answers expressed in appropriate terms;
- uses appropriate methods or steps to achieve answers;
- answers and ideas are expressed clearly.

112

NUMERACY	FOUNDATION
LEARNING OUTCOME: *Manage data and probability*	DATA 1

Troubleshooting

- works with others to decide what information is to be collected;
- collects information through a survey or interview;
- organises materials and information according to one specific criterion;
- classifies objects, and events into groups;
- draws circles, sections, axis, scales, lines, points and bars;
- constructs a bar graph, and a pictograph to illustrate information gathered through an interview or survey;
- constructs bar graphs using different scales: 1, 2, 5, 10;
- labels components clearly;
- interprets the scale of a graph to find appropriate points;
- interprets information displayed in own graphs, using own language.

113

Ideas/Reflections

114

NUMERACY

FOUNDATION

DATA 2

LEARNING OUTCOME: *Manage data and probability*

Demonstrations

❑ ***Collect Data***
Independently collect data to answer a community related question.

❑ ***Organise, Describe, Interpret...***
Organise, describe, read and interpret data gathered.

❑ ***Discuss Chance and Probability***
Discuss chance and probability in relation to the own surveys.

❑ ***Apply Data Management***
Apply data management skills and probability skills to situations at work and in everyday life.

115

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Context and Complexity of Materials:
- information gathered by students is easily found in the environment as is part of ever day life;
- topics are chosen by students, and are based on interest, or specialist area.

Sample Assessment Activities:
- conduct survey of TV viewing among peers;
- chart food preferences of children, teenagers or families;
- produce graph showing type of transportation used in your community;
- survey and graph the ages of children of group members;
- report to class or group results of survey;
- interpret survey or report and predict future needs in your community for education, housing employment needs.

- read and interpret existing charts on:
  - cereal packages – contents, grams of fat, sugar vitamins, etc.;
  - calorie charts;
  - weather charts – average rain, snow;
  - planting charts – for spring bulbs – size bulb to depth;
  - timetables for bus, train, airline schedules.

Performance Criteria:
- there are three pieces of work as evidence;
- work is legible;
- uses mathematical signs accurately;
- answers expressed in appropriate terms;
- uses appropriate methods or steps to achieve answers;
- answers and ideas are expressed clearly.

116

NUMERACY | FOUNDATION

LEARNING OUTCOME: *Manage data and probability* | DATA 2

Troubleshooting

- collects and organises data in a variety of ways;
- designs own methods to organise data;
- predicts the response to a survey before carrying out the survey;
- defines the terms related to surveys and graphs in own language;
- discusses the results of surveys using appropriate terms and language;
- reads, interprets and constructs graphs with different scales;
- selects the appropriate type of graph to illustrate the type of data gathered;
- defines commonly used statements about probability and chance in own language (ex. fifty-fifty chance, odds of three to one, etc.);
- makes decisions based on the frequency of occurrence of events.

Ideas/Reflections

NUMERACY

FOUNDATION

LEARNING OUTCOME: *Manage data and probability*

DATA 3

Demonstrations

❑ ***Complete a Research Project***
Complete a short work-related research project using questionnaires and a variety of sampling techniques.

❑ ***Experiment***
Perform probability experiments on everyday issues and draw conclusions based on the results.

❑ ***Construct Graphs***
Construct graphs from given data from specialist area and pose and answer questions about the graphs.

❑ ***Use Mean, Median and Mode***
Use the calculation of mean, median and mode to determine the best representation of the population for a community or workplace issue.

❑ ***Analyse Probability***
Analyse the use of probability and statistics in daily life.

119

IMPORTANT

Demonstrations must be completed as integral parts of real-life tasks.

They must not be completed in isolation.

Criteria

Context and Complexity of Materials:
- data and experiments are based on student interest and need from work and daily;
- some students may need teacher direction in the interpretation of data.

Sample Assessment Activities:
- analyze and interpret results of survey from such sources as:
  - a census;
  - hockey or baseball statistics;
  - casino charts;
  - farming – crop records, yields, etc.;
  - animal records – offspring, milk production;
  - business records – market study, home craft sales.

Performance Criteria:
- there are three pieces of work as evidence;
- work is legible;
- uses mathematical signs accurately;
- answers expressed in appropriate terms;
- uses appropriate methods or steps to achieve answers;
- answers and ideas are expressed clearly.

120

NUMERACY | FOUNDATION

LEARNING OUTCOME: *Manage data and probability* | DATA 3

Troubleshooting

- collects, organises, and displays data from a given set of instructions;
- analyses and interprets the results of a survey;
- identifies a subject of personal interest, and collects, organises, and analyses data related to it;
- answers specific questions about displayed data;
- interprets scales and labels correctly on graphs and charts;
- uses appropriate units when describing data;
- carries out a probability experiment from instructions, and records and analyses the results;
- explains differences between experimental results and projected results;
- selects the appropriate types of graph and units for a particular purpose;
- labels and displays data correctly;
- answers questions about graphs;
- uses a computer to collect, organise, display and analyse data;
- calculates mean, median, and mode;
- explains which of mean., median and mode, best represents the population;
- selects samples using randomness;
- defines randomness in own language, and explains why it is important.

121

Ideas/Reflections

122

NUMERACY

FOUNDATION

PATTERNING 1

LEARNING OUTCOME: ***Use Patterning and Algebra***

Demonstrations

❑ ***Classify Materials***
Classify everyday materials according to shape, size and quantity.

❑ ***Continue a Pattern***
Continue a pictorial, concrete, or numerical pattern.

❑ ***Group Numbers***
Group numbers into fact families.

❑ ***Determine Missing Term***
Apply knowledge of number fact families to determine the missing term in a simple equation.

❑ ***Explain Relationships***
Explain relationship between mathematical operations in own language.

123

Criteria

Context and Complexity of Materials:
- materials and are present in everyday life;
- concrete materials are used to illustrate concepts;
- student uses own language to describe;
- mathematical concepts.

Sample Assessment Activities:
- street numbers;
- postal codes;
- telephone numbers;
- area codes;
- wooden puzzles;
- aptitude tests – spatial relationships.

Performance Criteria:
- there are three pieces of work as evidence;
- work is legible;
- uses mathematical signs accurately;
- answers expressed in appropriate terms;
- uses appropriate methods or steps to achieve answers;
- answers and ideas are expressed clearly.

124

IMPORTANT

Demonstrations and skills listed under this outcome are part of the regular curriculum, and although they are hard to demonstrate by practical means, are necessary as a foundation for further studies in the academic field. (i.e. high school credits leading to college or university)

NUMERACY | FOUNDATION

LEARNING OUTCOME: *Use Patterning and Algebra* | PATTERNING 1

Troubleshooting

- classifies materials found in everyday life;
- recognises patterns in the environment;
- reproduces patterns in the environment;
- extends patterns in the environment;
- creates a wide variety of repeating patterns;
- extends number patterns by skip-counting, adding on, or subtracting;
- solves problems using patterns;
- identifies counting patterns on a hundreds chart;
- uses mathematical signs;
- groups number facts into families for addition and subtraction;
- shows the relationship between multiplication and division as repeated addition and repeated subtraction.

125

Ideas/Reflections

126

NUMERACY

FOUNDATION

LEARNING OUTCOME: *Use Patterning and Algebra*

PATTERNING 2

Demonstrations

❑ ***Manipulate Geometric Patterns***
Identify, extend, and create geometric patterns in daily life.

❑ ***Manipulate Number Patterns***
Identify, extend and create number patterns involving whole numbers and decimals.

❑ ***Solve Problems***
Solve problems using patterning.

127

Criteria

Context and Complexity of Material:
- materials and are present in everyday life;
- concrete materials are used to illustrate concepts;
- student uses own language to describe mathematical concepts.

Sample Assessment Activities:
- filing – personal, business;
- packaging – shipping, moving;
- construction project – fence building – repeat of pattern;
- farming – crop planting.

Performance Criteria:
- there are three pieces of work as evidence;
- work is legible;
- uses mathematical signs accurately;
- answers expressed in appropriate terms;
- uses appropriate methods or steps to achieve answers;
- answers and ideas are expressed clearly.

128

IMPORTANT

Demonstrations and skills listed under this outcome are part of the regular curriculum, and although they are hard to demonstrate by practical means, are necessary as a foundation for further studies in the academic field. (i.e. high school credits leading to college or university)

NUMERACY | FOUNDATION

LEARNING OUTCOME: *Use Patterning and Algebra* | PATTERNING 2

Troubleshooting

- recognises patterns;
- articulates rules which apply to patterns;
- extends geometric patterns;
- uses mathematical language to explain patterns;
- records information regarding patterns, by using a graph or chart;
- solves problems involving whole numbers and decimals using patterning strategies;
- describes patterns in materials found in everyday life such as art, music, the home.

129

Ideas/Reflections

130

NUMERACY

FOUNDATION

LEARNING OUTCOME: *Use Patterning and Algebra*

PATTERNING 3

Demonstrations

❑ ***Use Formulae***
Use mathematical formulae to express patterns.

❑ ***Develop Formulae***
Develop formulae to express new patterns.

❑ ***Simplify Expressions***
Simplify algebraic expressions.

❑ ***Solve Expressions***
Solve algebraic expressions involving one variable.

❑ ***Solve Linear Equations and Inequalities***
Solve problems using linear equations and inequalities.

❑ ***Use patterns, tables and graphs***
Use patterns, tables and graphs to represent and solve problems.

❑ ***Apply Variables, Equations, and Expressions***
Apply the concepts of variable, equation and expression.

❑ ***Graph Equations***
Graph equations.

131

Criteria

Context and Complexity of Materials:
- new concepts introduced at this level are more academic in nature, and are necessary for those proceeding to secondary education;
- assessments may be performed by pencil and paper tests.

Sample Assessment Activities:
- mileage calculation – miles and kilometres;
- construction projects – materials required;
- inventory control;
- production charts;
- wall papering;
- sewing project – materials required.

Performance Criteria:
- there are three pieces of work as evidence;
- work is legible;
- uses mathematical signs accurately;
- answers expressed in appropriate terms;
- uses appropriate methods or steps to achieve answers;
- answers and ideas are expressed clearly.

132

IMPORTANT

Demonstrations and skills listed under this outcome are part of the regular curriculum, and although they are hard to demonstrate by practical means, are necessary as a foundation for further studies in the academic field. (i.e. high school credits leading to college or university)

NUMERACY | FOUNDATION

LEARNING OUTCOME: *Use Patterning and Algebra* | PATTERNING 3

Troubleshooting

- extends patterns using a wide variety of concrete materials;
- describes, predicts and verifies a pattern using concrete modelling;
- uses variables to extend a pattern beyond the point where concrete modelling is practical;
- simplifies algebraic expressions using concrete materials;
- solves problems and linear equations using trial and error and concrete materials;
- solves problems and linear equations using formal methods and formulae;
- draws graphs using data from real life.
- graphs relations using a variety of methods and technologies;
- translates words and phrases into variables, expressions and equations;
- matches mathematical expressions to the words and phrases they represent;
- translates words and phrases that model real-life problems, into mathematical expressions;
- graphs relations from a given table of values;
- graphs relations from a table of values developed in an investigation.

133

Ideas/Reflections

134

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement (OERI)
Educational Resources Information Center (ERIC)

NOTICE

REPRODUCTION BASIS

☑ This document is covered by a signed "Reproduction Release (Blanket)" form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.

☐ This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").