



Canadian Language
Benchmarks/
Essential Skills

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Centre for Canadian Language Benchmarks

On the Job

The Essential Skill of Numeracy





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Numeracy

Putting the Numbers to Work

Many teachers are probably saying, “I’m a language teacher not a math teacher...” in response to the title of this section. This may be true, but the fact is that anyone working with numbers in the workplace typically finds them embedded in a lot of spoken or written text. Explanation, elaboration and analysis of the numbers, for example, are frequently presented along with the numbers. There is a language challenge, then, that needs to be considered in numeracy tasks.



The first and most obvious step towards using numbers is to learn to communicate clearly and accurately. When you think of financial exchanges, deals or negotiation, oral communication of numerical values is crucial. One consequence of not teaching numeracy is the continuing vulnerability of learners in our marketplace where “buyer beware” is still a truism.

Numeracy is not just math. It involves anything that requires numbers or thinking in quantitative terms. The Essential Skills Reader’s Guide defines four application settings for numerical calculation:

- Money Math
- Scheduling or Budgeting and Accounting
- Measurement and Calculation
- Data Analysis

The complexity rating for numerical calculation has five levels based on two dimensions: operations required (the actual math used) and the amount of translation required (turning a work problem into a set of mathematical operations).

There is a separate complexity rating scale for *Numerical Estimation*, which it considers:

- whether there is a set procedure;
- the number of factors involved;
- the amount of information available;
- the consequence of error; and
- the degree of precision required.

Adding, subtracting, multiplying and dividing as numerical functions are the same around the world. The difference comes with the language we use to describe these functions and how these are recorded. In many countries, for example, the comma is used for the decimal point, or the calligraphy for the number is different (e.g., in some countries, the number seven is written with a line in the middle. This could cause some confusion at a bank here in Canada.) Teaching these basic conventions and vocabulary is critical.

Sample Numeracy Tasks: Retail Sales Associates and Tellers



You can find CLB/
Essential Skills lesson
plans for both these
occupations at
www.language.ca and find
Essential Skill Profiles at
[http://srv600.hrdc-
drhc.gc.ca/esrp/english/gen-
eral/ES_Profiles_e.shtml](http://srv600.hrdc-drhc.gc.ca/esrp/english/general/ES_Profiles_e.shtml)

The following numeracy tasks for two occupations demonstrated the range of tasks that involve numeracy. These are taken from the Essential Skill Profile for each occupation. Note that there are no CLB ratings for tasks using Numeracy skills. The Canadian Language Benchmark's Comparative Framework focuses on the language needed to complete a task and does not separate out mathematical or numeracy functions. The number in brackets after each task is the Essential Skill complexity rating.

Retail Sales Associates (NOC # 6421)

- handle cash, credit card and debit card transactions and provide change (money math. (ES 1)
- measure floor space in order to plan the placement of display items. (Measurement and calculation math) (ES 1)
- may measure products, such as pieces of plywood, yards of material or dimensions for rubber stamps. (Measurement and calculation math) (ES 1)
- read and interpret sales statistics comparing sales over various periods of time (data analysis math) (ES 1)

- estimate the length of time it will take to set up a display (numerical estimation) (ES 1)
- estimate the size of an item, which is most likely to be right for a customer. (Numerical estimation) (ES 1)
- calculate discounts, taxes and currency exchange. (Money math) (ES 2)
- may calculate quantities, such as the quantity of material required to cover a window of certain dimensions, taking into account the fullness required by the customer. (Measurement and calculation math) (ES 2)

Tellers, Financial Services (NOC # 1433)

- count, add and subtract money during banking transactions (money math) (ES 1)
- calculate foreign exchange conversions and service fees (money math) (ES 2)
- make calculations to determine which type of account will be most suitable for a client's use based on cost and convenience. (scheduling or budgeting and accounting math) (ES 2)
- estimate the amount of money to order, ship or keep every day (numerical estimation) (ES 2)
- rent safety deposit boxes to senior citizens, prorating yearly fees and applying seniors' discounts (money math) (ES 3)

Classroom Anecdote

Some internationally trained engineers with CLB 6 or higher were found to have performed poorly on the numeracy section of the TOWES (Test of Workplace Essential Skills) despite a proven ability to perform the math calculations. Their instructors proposed two possible explanations for why this was the case:

- The students had difficulty determining the operation/operations they needed to use, because of the English language text embedded in some of the test items (word-based problems).
- Finding the information to solve the problem often requires searching through various documents adding the need for Document Use to solve the numeracy task. This adds a higher level of complexity, increasing the risk of error.



CLB 1 – 4 Strategies



CLB 1 – 4 Strategies

At Benchmark levels 1 to 4, clear communication and understanding of the values of numbers is already part of many ESL curricula. Money, banking, shopping and other life skills are already being taught and many learners have part-time jobs and have had to learn some basic money management. How can these skills be developed further for money and time management? What are some areas that might need a lot of practice? The following are just a few suggestions:

- Eight, eighteen or eighty – sometimes it is very difficult to hear the difference between these numbers. All of the numbers ranging from thirteen to nineteen are very difficult to differentiate from thirty, forty, fifty, sixty, seventy, eighty, and ninety. Putting the stress on the appropriate syllable (Primary stress on the first syllable for multiples of ten, and on second syllable for numbers ending in ‘-teen’). Also, getting students to stretch the vowel sound to a three count will help to make these numbers clearer.
- How is this different from what is already being taught in the ESL classroom? Not much, other than the learner faces higher stakes at work and as such, needs to confirm that he understood what was being said. This strategy or even writing the number down for confirmation can help avoid errors. For example, if an car salesman answers a customer’s phone inquiry regarding the price of a \$30,000 car and says “Thirtee(n) thousand dollars” but means “Thirty”, may lose a sale when the customer arrives to find out the price quoted is not the correct price for the car. Errors in money transactions are not well tolerated by the general population and can be cause for suspicion. It has to be made clear that the learner must practice and get it right.

Teaching Idea



Teaching Idea #1 - Ways with Numeracy Vocabulary

This is actually a group of strategies related to teaching numeracy vocabulary. Some of the vocabulary that is useful to teach in order to talk about time, scheduling, estimation or calculation includes:

- **Names of coins and bills** — Both proper and colloquial names for common currency should be taught; nickels, dimes, quarters, pennies, loonies, toonies, bills etc.



- **Number pronunciation** — Many ESL speakers have difficulty in saying numbers in general and saying all of the “teens” specifically. Because everyone has to buy and sell items to survive, perfecting the pronunciation of numbers should be a regular, repeated, and well practiced part of the curriculum. One fun activity might be to have learners predict the cost of items and have a partner record these costs and then compare the numbers. Repeat this until the numbers are understood clearly by the partner.
- **Word Order** — Teach and practice correct word order and alternative ways of referring to amounts when talking about money, such as:
 - \$3.38 = Three dollars 38 cents,
 - \$58 = 58 dollars,
 - \$3500.00 = thirty-five hundred dollars or three thousand five hundred dollars
 - \$25000.00 = twenty-five K or twenty-five thousand.
- **Time and Scheduling** – concepts and specifics of time, calendars, months, weeks, holidays etc.

Teaching Idea



Teaching Idea #2 – “The Price is Right”

Role plays you develop with students based on numeracy tasks identified earlier for Sample Numeracy Tasks: Retail Sales Associates and Tellers” Sample Numeracy Tasks: Retail Sales Associates and Tellers” on page 2 can also be used in a class to practice.

One way of practicing monetary terms/vocabulary is to play a game. This idea comes from a game you can use with Stage One CLB learners as well as higher level students, based on the North American television game show, *The Price is Right*¹. (The game show, *Let’s Make a Deal*² is similar.) This game is fun, fast-paced and shows you the savvy the students have for accurately being able to predict the price of items that can be purchased in a variety of stores. It also helps develop team work, another of the nine Essential Skills.

The *Price is Right* game, while not specifically work-related, does require that prices and numbers be pronounced clearly and correctly to be accepted.

You can set the scene by showing the class a small portion of the actual show prior to introducing the game to the class.

1. Prior to the class, cut out a series of photos of merchandise from store flyers, magazines, or catalogues. Choose a variety of items including appliances, electronics, and grocery items. Paste these photos onto some appropriate sized construction paper. You may also want to add the actual price noted in the flyer/catalogue in pencil somewhere on the back so that you know the price of each item. The more varied the items, the wider the range of the numbers practiced.
2. In the class, divide the class into two or three teams. Explain the rules to the class as being the following:
 - To select the order of team play, one player from each team gets shown a photo of an item and asked to guess the price. Tell the class the correct price. The player with the closest price gets to play first, the second closest plays second, and the one furthest from the actual price plays last. The teacher (or a student) can keep track of correct answers.
 - Only one person has the chance to guess the item price. Team members can help the player by saying their guesses, but the final answer must come from the player whose turn it is.

Note: Occasionally other players on the team will volunteer the correct pronunciation to the player if they hear an ambiguous number.

- Prices must be clearly enunciated to be accepted. However, as the neutral party, the teacher can ask a player to repeat his answer

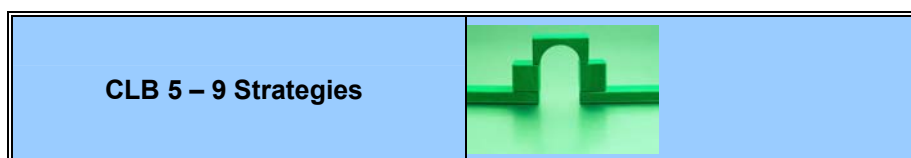
¹ The Price is Right is copyright to CBS Broadcasting Inc. More information on the game show are available at http://en.wikipedia.org/wiki/The_Price_is_Right.

² Let’s Make a Deal is a registered trademark, copyright of Hatos-Hall Productions. More information on how this game is available at http://en.wikipedia.org/wiki/Let%27s_Make_a_Deal#Other_deals.

once. If it is still not clearly stated, then the teacher can ask the next player on an opposing team to give a guess.

- Scores are can be kept either by counting the number of correct answers, or by keeping a tally of the prices guessed accurately on each team.

Students enjoy this game as it helps them to practice pronunciation for numeric and monetary terms within the context of a game show.



CLB 5 – 9 Strategies – Numeracy at the Higher Benchmarks

Ask your learners to bring real life situations to class. Use lease agreements, bank deposit and withdrawal slips in the class using hypothetical names and account information. Invite students to bring sample tasks and documents with Numeracy tasks from their places of work.

Learners at CLB 5-9 are hoping to move into the workplace at a higher level of responsibility and challenge. The business world is primarily focused on making profits. Many occupations use numeracy that requires not just accuracy in the actual job tasks but also facility in the language (e.g. appropriate terminology and industry-related jargon) related to the occupation. Along with this higher level of responsibility comes an increased focus on ensuring that resources are managed appropriately with resulting increased profits.

By embedding things like Budgeting, Scheduling, Measuring and Calculating tasks into classroom language activities will benefit all learners.

Scheduling (often referred to as *Resource Management*) is encouraged through the use of calendars and schedules; tracking deadlines and appointments helps learners assign amounts of time to tasks. This can include:



- estimating time to complete a task.
- estimating money needed to purchase items.
- estimating time to meet the goal of arriving for class on time.
- analyzing data through the recording of attendance, counting times individuals are late and tracking them according to the program's attendance policy.
- budgeting time to complete several different tasks with differing levels of priority, within the same time frame (multitasking)
- budgeting and basic banking functions.

Great Resource

For more practice exercises for numeracy, go to the **Measure Up** web site at <http://measureup.towes.com/>



The *Measure Up* web site has several numeracy tasks based in authentic workplace materials. For example, two occupations you will find an activity there set to practice a higher level of numeracy are for *Cooks and Labourers in Food* or *Beverage and Tobacco Processing*. Deciding what needs to be calculated and the various steps it takes to reach the correct answer adds to the complexity of these tasks.

Instructional Design Ideas		
	Classroom Ideas	Link to Workplace
Time management has some implications for numerical estimation. Here are a few ideas to encourage learners to be organized and develop habits that will help them stay organized in the workplace:	- Overlapping deadlines for assignments to practice the use of a day timer or scheduler	Simulate multitasking and job task planning in the workplace
	Tracking attendance and punctuality in the day timer to complete a monthly attendance report. (You can then check this against your own record and compare.)	Simulate monthly time sheets and attendance records
	Sending reminders and updates via e-mail to practice revising schedules	Reinforce the need to regularly check your e-mail

Notes:

Glossary of Terms

Jargon

Jargon is a term that indicates a specialized, workplace or occupation-specific vocabulary that usually only members of that occupation or workplace can interpret and use. For example, in retail, there are common terms like "keyholder", "close the cash", "balance". In accounting, terms like "A/P", "A/R", "reconciliation", "P.O.", etc. are commonly used.

Numeracy

Numeracy is not just mathematics. It refers to tasks involving numbers or thinking in quantitative terms. In Essential Skills, there are four applications: Money Math, Scheduling/Budgeting & Accounting, Measurement & Calculations, and Data Analysis.

Numerical Estimation

Numerical estimation includes the following tasks: (1) whether there is a set procedure; (2) the number of factors involved; (3) the amount of information available;

(4) the consequence of error; and (5) the degree of precision required.

Resource Management

Resource Management refers to scheduling of employees or contractors on a project or assigned to a workplace task.

TOWES

Test of Workplace Essential Skills (TOWES), is a test that evaluates Reading, Document Use, and Numeracy skills for employment using authentic workplace documents. It is available in English or French and was developed by Bow Valley College in Calgary. (TOWES rhymes with cows)

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