

Course
Arithmetic and Money
MTH-B213-4
Literacy



“A fortune is better protected in one’s head than in one’s wallet.”

Félix Leclerc

Presentation of the Course *Arithmetic and Money*

The course *Arithmetic and Money* is designed to help adult learners deal competently with real-life situations that require the ability to manage money.

In this course, adults learn about the Canadian monetary system and learn to use basic arithmetic in their daily lives.

By the end of the course, adult learners will be able to interpret and convey money-related information expressed in writing or orally.

They will also be able to read, write, estimate and calculate amounts of money. They will be able to select and perform the four operations on natural numbers using written calculation algorithms or using a calculator in the case of monetary amounts containing decimals.

Dealing With the Real-Life Situations

Dealing effectively with real-life situations is based on actions. These actions are grouped into categories and make use of a set of resources that include operational competencies and essential knowledge. During the learning process, adults are expected to construct knowledge related to these resources in order to be able to deal appropriately with their real-life situations.

The class of situations, categories of actions, operational competencies and essential knowledge constitute the compulsory elements of the course. These elements are explained in detail under their respective headings.



Class of Situations Addressed by the Course

This course addresses a single class of situations: *Dealing with money in everyday situations*.

The real-life situations in this class require that adults recognize, write, estimate and determine amounts of money by performing additions, subtractions, multiplications and divisions involving currency. Real-life situations such as buying a consumer product, moving or looking for a paid job require adults to have a certain knowledge of the units of the Canadian monetary system. Adults use the units of this system every time they check their change,

compare rents in the classified ads, establish a list of daily expenses or obtain information about the salary offered for a job.

These real-life situations address the needs expressed by adults and take their interests into account. The situations can involve the personal, professional, social or cultural aspects of their lives.

| Class of Situations | Examples of Real-Life Situations |
|---|---|
| Dealing with money in everyday situations | <ul style="list-style-type: none">▪ Purchasing a consumer product▪ Renting a product▪ Planning personal and family expenses▪ Practising a sports or a recreational activity▪ Going on a cultural outing▪ Paying back a debt▪ Looking for or occupying a paid job▪ Moving |

Categories of Actions

The *categories of actions* are groups of actions that are appropriate for dealing with the real-life situations addressed in the course. *Examples of actions* are provided to illustrate the scope of the category in a variety of contexts.

| Categories of Actions | Examples of Actions |
|---|--|
| <ul style="list-style-type: none"> ▪ Reading money-related information | <ul style="list-style-type: none"> ▪ Compares the prices of items in the classified ads (e.g. housing, second-hand bicycle) ▪ Reads the cost of cultural or sports activities in ads ▪ Consults advertising brochures before making a purchase ▪ Becomes informed about the salary offered in printed job ads ▪ Examines the cost of items on a list (school materials, recreational equipment) |
| <ul style="list-style-type: none"> ▪ Writing money-related information | <ul style="list-style-type: none"> ▪ Makes a list of daily expenses ▪ Makes a table of various prices for the same item sold in different stores ▪ Makes a list of foreseeable expenses for a family outing ▪ Writes down each amount received during a fundraiser ▪ Makes a note of the expenses related to tobacco use during a set period |
| <ul style="list-style-type: none"> ▪ Interacting orally in cases involving money | <ul style="list-style-type: none"> ▪ Asks for the price of an item including the taxes ▪ Recalls information conveyed by the media concerning the cost of gasoline ▪ Obtains information about the salary offered for a job ▪ Suggests an agreement for paying back a debt to a friend or family member ▪ Phones different businesses to compare the price or rental cost of an item |

| Categories of Actions | Examples of Actions |
|--|---|
| <ul style="list-style-type: none"> ▪ Performing calculations involving amounts of money | <ul style="list-style-type: none"> ▪ Shares the cost of a meal among several people ▪ Checks his/her change after a transaction ▪ Estimates the cost of renting a tool for a few hours ▪ Calculates the total cost of school supplies for his/her child ▪ Calculates daily expenses ▪ Estimates the cost of a sports activity ▪ Estimates the savings resulting from quitting smoking ▪ Does a quick calculation of his/her purchases before going to the checkout ▪ Pays back a debt in several payments ▪ Writes down each amount collected during a fundraiser |

Compulsory Elements and End-of-Course Outcomes

The compulsory elements are those that the teacher must absolutely take into account when designing learning situations.

Class of Situations

Dealing with money in everyday situations

Categories of Actions

- Reading money-related information
- Writing money-related information
- Interacting orally in cases involving money
- Performing calculations involving amounts of money

Operational Competencies

Thinks logically

- Selects information
- Distinguishes between monetary amounts expressed orally or in writing
- Makes connections among selected items of information
- Uses pertinent examples

Communicates

- Listens attentively
- Decodes symbols, notations and terms related to money
- Asks for clarifications
- Repeats information to check comprehension
- Uses symbols, notations and terms related to money
- Writes amounts of money legibly
- Asks for help, if necessary

Essential Knowledge

- Natural numbers
- Monetary concepts
- Arithmetic operations (addition, subtraction, multiplication and division)

The end-of-course outcomes describe how adults make use of the compulsory elements to deal with the real-life situations addressed in the course.

End-of-Course Outcomes

In order to deal with the real-life situations in the class *Dealing with money in everyday situations*, adults learn about money-related concepts and use their knowledge of natural numbers and the four arithmetic operations of addition, subtraction, multiplication and division.

Adults recognize the units of the Canadian monetary system in situations that involve verbal interactions and reading or writing money-related information. They decode monetary symbols, notations and terms. They distinguish between sums of money they read or hear and make connections with other information that is appropriate in dealing with the real-life situation. In their interactions with others, they are concerned with communicating effectively. They listen attentively to money-related information, ask for clarifications, if necessary, and repeat information they receive to make sure they have understood it.

After verifying the relevance of the selected information and taking the context into account, adult learners compare, estimate or determine one or more sums of money. They are able to recognize equivalences for different monetary values. When required by the situation, adult learners perform one or more of the four arithmetic operations by using written calculation algorithms in the case of natural numbers and a calculator in the case of amounts containing decimals. If necessary, they use examples to validate their work.

Throughout the learning process, adults try to use their knowledge of monetary concepts and of natural numbers and arithmetic operations. They use the symbols, terms and notations of the Canadian monetary system correctly and are able to conduct transactions involving coins and bank notes. Learners make sure they write out amounts correctly and legibly. They do not hesitate to ask for help if they encounter difficulties.

Evaluation Criteria

- Interprets money-related information correctly
- Writes money-related information correctly and legibly
- Interacts orally in an appropriate manner in cases involving money-related information
- Correctly determines an amount of money

Operational Competencies

The contribution of each operational competency is described in terms of the actions that are appropriate for dealing with the real-life situations in this course. These operational competencies are addressed in other courses and therefore all of the courses taken together contribute to their development.

In this course, only the following operational competencies are addressed: *Thinks logically* and *Communicates*.

Contribution of the Operational Competency *Thinks logically*

The operational competency *Thinks logically* helps adult learners to organize their thoughts and guides them in taking action when dealing with real-life situations related to *Dealing with money in everyday situations*.

Learners select the information they need to form an accurate representation of the real-life situation at hand, whether it is a question of recognizing, estimating or determining a sum of money. When using their knowledge of money, adults use this operational competency in order to distinguish between pieces of monetary information whether this information is expressed orally or in writing. This competency also allows them to make connections with other pieces of information, such as the context and the nature of the expense. When calculating amounts of money, adult learners use relevant examples to validate their work, if necessary.

Contribution of the Operational Competency *Communicates*

The operational competency *Communicates* makes it possible for adults to exchange meaningful information in their daily lives. It is essential to the effective interpretation and transmission of messages in various real-life situations that involve *Dealing with money in everyday situations*.

In their daily interactions involving money, adult learners must understand others and make themselves understood. Thus, they listen attentively to the information provided. They decode symbols, notations and terms related to money, ask for clarifications and repeat information to make sure they have understood it. They express themselves by using money-related mathematical language correctly, and make sure they write monetary amounts legibly. If necessary, they do not hesitate to ask for help from someone close to them, a peer or a resource person in order to overcome a difficulty.

Essential Knowledge

All of the knowledge shown in the following table is compulsory since it is essential for dealing with a number of situations in the class *Dealing with money in everyday situations*.

The left-hand column shows the essential knowledge that was not covered in previous courses. Where necessary, its scope is shown in parentheses. The right-hand column shows the essential knowledge that was covered in previous courses. Since it is also required to deal with the situations in this course, adult learners must deepen their understanding of this knowledge by adapting it to situations that involve money.

Since the essential knowledge pertaining to this course is dealt with only in a monetary context, this material is covered only partially. In order to present all the aspects of this essential knowledge in a greater range of contexts, it has been made compulsory in other mathematics courses that examine other types of situations.

| New compulsory knowledge | Compulsory knowledge acquired in previous courses |
|---|---|
| <p>Natural numbers</p> <ul style="list-style-type: none"> • Reading and writing natural numbers in word form • Rounding off a natural number to the nearest tenth, hundredth or thousandth • Factors and multiples of a natural number <p>Monetary concepts</p> <ul style="list-style-type: none"> • Units of the Canadian monetary system (cents and dollars) • Converting a dollar amount into an amount expressed in cents and vice versa • Value of coins and banknotes • Equivalences between various coins and bank notes (e.g. one dollar is equivalent to four quarters) | <p>Natural numbers</p> <ul style="list-style-type: none"> • Natural numbers • Representing natural numbers (using concrete materials and the base 10 number system) • Place value of a digit within a number • Composing and breaking down a natural number • Counting • Comparing natural numbers • Counting by multiples • Everyday vocabulary associated with comparing quantities (e.g. as many, equal, the same, similar, more, less, less than, greater than, the largest, the smallest) |

| New compulsory knowledge | Compulsory knowledge acquired in previous courses |
|---|--|
| <p>Arithmetic operations</p> <ul style="list-style-type: none"> • Understanding of multiplication and division • Vocabulary related to the multiplication and division (e.g. multiply by, times, how many in all, separate, divide, how much for each one) • Property of operations: commutative law • Arithmetic tables: multiplications (0×0 to 10×10) and the corresponding divisions • Calculations involving multiplication and division of natural numbers (using a calculator, concrete means and written calculation algorithms) • Calculations involving the four operations on decimals (using a calculator and limited to two decimal places) • Making a mental estimate of the result of an operation involving natural numbers • Multiplication and division of a number by 10, 100, 1000 | <p>Arithmetic operations</p> <ul style="list-style-type: none"> • Equality • Understanding of addition and subtraction • Everyday vocabulary associated with addition and subtraction (e.g. add, more, in all, total, sum, take away, less, remainder, difference) • Addition and subtraction involving natural numbers (using a calculator and written calculation algorithms) • Arithmetic tables: additions ($0 + 0$ to $10 + 10$) and corresponding subtractions • Calculations involving the addition and subtraction of decimals (using a calculator and limited to two decimal places) |

Attitudes

The following attitudes are provided as suggestions only. The development of these attitudes can help adults to become more competent in dealing with the real-life situations in this course.

| Confidence in Their Abilities | Perseverance |
|--|--|
| If they are confident in their abilities, adults spring into action more readily when required by the situation and learn from their mistakes. | Persistent adults make a sustained effort and look for solutions to their difficulties. When needed, they ask for help from a resource person or seek support from a peer. |

Complementary Resources

The following resources are provided as suggestions only and consist of references that may be consulted in learning situations.

| Social Resources | Material Resources |
|--|---|
| <ul style="list-style-type: none">▪ Public and parapublic organizations▪ Community organizations▪ Services provided by the training centre▪ Commercial establishments (e.g. grocery stores, drugstores) | <ul style="list-style-type: none">▪ Coins▪ Calculator▪ Information brochures on recreational activities▪ Classified ads from newspapers▪ Various ads and advertising brochures▪ Computer |

Contribution of the Subject Areas

The contribution of all the subject areas is also useful for dealing with the real-life situations in this course. In the Literacy level courses, the examples of real-life situations are similar in some ways and complement the essential knowledge covered in the *Computer Science* program, which also belongs to the Mathematics, Science and Technology subject area, and in the *English, Language of Instruction* program, which belongs to the Languages subject area. This makes it possible to deal with different aspects of a real-life situation and to create cross-curricular learning situations. The elements identified for each subject area are not compulsory and do not constitute prerequisites.

Andragogical Context

It is evident that one must deal with money in everyday life. In order to help adults deal with a variety of real-life situations, the *Arithmetic and Money* course covers basic concepts related to the monetary system as well as algorithms for the four arithmetic operations (addition, subtraction, multiplication, division). More specifically, the course helps adults read, write and determine amounts of money, and to deal with different situations in which they must apply this knowledge. In this regard, this course is essential to helping adults become more autonomous.

Adults are encouraged to play an active role in constructing their knowledge of mathematics. However, given the degree of autonomy needed to read task-related information or instructions, the teacher provides constant support in learning activities. Oral and team work is preferred when the context permits. The concrete materials made available to adults facilitate learning and the construction of knowledge. Frequent reflection on what has been learned allows adults to gauge their progress and to make the necessary

adjustments. The teacher is concerned with creating an atmosphere of confidence that makes learning enjoyable and fuels the adult learners' determination to persevere. The teacher makes sure they have the necessary resources to explore, understand and organize the data they need in order to plan and take action.

The Literacy level courses are designed to allow for the flexibility needed to adjust to the practical needs of adults. To enable adults to deal competently with real-life situations, the examples examined in the different courses are in some ways similar and involve using what was learned in English, Language of Instruction, Mathematics and Computer Science.

This is how the different facets of a real-life situation can be explored, thereby making it possible to create cross-curricular learning situations. The courses are adapted to adults' level of autonomy with respect to their ability to use written materials.

Learning Situation

The learning situation that follows is provided as an example to show teachers how the principles of the education reform can be applied in the classroom.

It is authentic in the sense that it addresses a real-life situation (taken from the class of situations in the course) that adults may find themselves in. It is sufficiently open and comprehensive to allow adult learners to explore several important aspects related to dealing with this real-life situation.

The examples of actions presented in the course help the teacher to identify those actions that an adult would take to deal with the real-life situation. The teacher can then refer to these examples in order to develop pertinent learning activities.

The learning situation is organized in terms of the three steps of the teaching-learning process, which are as follows:

- planning learning
- actual learning
- integrating and reinvesting learning

These steps highlight the principles of the education reform insofar as they encourage adults to be active, to reflect on their learning and to interact with their peers when the learning context is suitable. They include learning activities and may also include evaluation activities intended to support adults in the learning process.

These activities help learners to construct knowledge related to the compulsory elements of the course that are targeted by the learning situation concerned: one or more categories of actions, essential knowledge and the actions of the operational competencies associated with the categories of actions.

The example provided also refers to certain teaching strategies—pedagogical methods and techniques—that can be selected according to the learners, the context and the learning environment. Certain learning strategies may also be suggested, as well as a variety of material and social resources.

Example of a Learning Situation

Furnishing a Room

Furnishing a Room is an example of a learning situation that can be used in this course. It belongs to the class of situations *Dealing with money in everyday situations* and, more particularly, the real-life situation *Purchasing a consumer product*. Throughout this learning situation, adults use the operational competencies *Thinks logically* and *Communicates*.

The teacher introduces the learning situation by handing out a list of decorative items to be purchased and an assessment of the costs involved. The adult learners are asked to complete this list by taking into account their own ideas and tastes with respect to home decoration. The teacher then leads a discussion on the value of the items to be purchased and whether these costs are realistic, with a view to determining the total cost of decorating the room.

The adult learners are then encouraged to experiment with a way of arriving at a more accurate estimate of how much it will cost to decorate the room. The teacher provides instructions and hands out a fictitious budget that must be followed as well as two advertising brochures featuring the items to be purchased. Learners work individually or in pairs to find the items they are looking for and write their name and price on a sheet of paper. A discussion of the results of this exercise will make it possible to determine the accuracy of the information collected. The teacher writes this information on the board during the discussion to make sure that the amounts read aloud by individual learners are the same as those written down. Since learners can choose different items, the amounts will not necessarily be the same for everyone.

The teacher explains the usefulness of rounding off amounts of money to the nearest dollar in order to make it easier to estimate

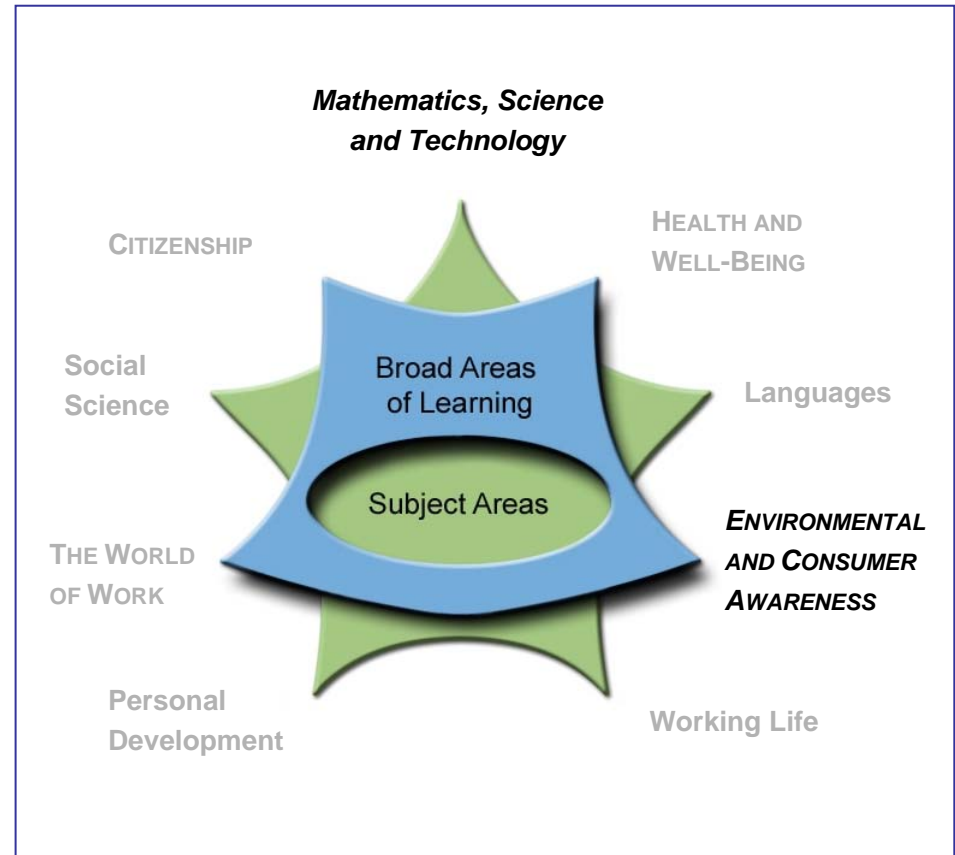
costs. The teacher demonstrates this by writing a few amounts on the board and asking the adults to participate. Each learner then rounds off amounts that were not dealt with in the demonstration. The teacher walks around the classroom to monitor adult learners more closely, motivate them and encourage them to be confident in their ability to learn and persevere. A final verification of the results provides an opportunity for additional explanations, as needed. Each learner writes the rounded amount on the sheet of paper, beside each item they have chosen to decorate the room.

The next step consists in estimating the cost of decorating the room based on the rounded amounts. As the fictitious budget must be followed, adult learners working either individually or in teams are asked to calculate the difference between the estimated cost and the budgeted amount. The teacher then gets adult learners to use their logic by asking: Which arithmetic operations are appropriate in this context? A discussion on the meaning of the operations may lead to the conclusion that addition and subtraction are the most appropriate operations in this context. The adult learners then work individually: they use their knowledge of written calculation algorithms to perform the necessary operations. The teacher checks each person's work and, if necessary, reviews certain concepts.

To conclude the learning situation, the teacher reviews the completed tasks and steps involved. The adults are asked to comment on this approach and on what they have learned as well as the areas that need more work. They reflect on the possibility of applying what they have learned in other contexts.

Elements of the Course Addressed by the Learning Situation

| Class of Situations | |
|---|--|
| Dealing with money in everyday life | |
| Learning Situation | |
| Furnishing a Room | |
| Categories of Actions | |
| <ul style="list-style-type: none"> ▪ Reading money-related information ▪ Writing money-related information ▪ Interacting orally in cases involving money ▪ Performing calculations involving amounts of money | |
| Operational Competencies | Essential Knowledge |
| <ul style="list-style-type: none"> ▪ Thinks logically ▪ Communicates | <p>Natural numbers</p> <ul style="list-style-type: none"> ▪ Representing natural numbers (using concrete materials and the base 10 number system) ▪ Comparing natural numbers ▪ Rounding off a natural number to the nearest tenth, hundredth or thousandth <p>Monetary concepts</p> <ul style="list-style-type: none"> ▪ Units of the Canadian monetary system (cents, dollars) <p>Arithmetic operations</p> <ul style="list-style-type: none"> ▪ Understanding of arithmetic operations ▪ Everyday vocabulary related to arithmetic operations ▪ Addition and subtraction involving natural numbers |



Complementary Resources

- Department store brochures advertising home decoration items
- Flyer for a hardware store advertising paint and equipment needed to paint

