Tutor Guidelines

Functional Mathematics

Level 3 Unit 2: Algebra

Acknowledgements

Acknowledgements

This booklet is part of a pack of resources for Functional Mathematics Level 3 which FÁS commissioned for use in their training programmes. A similar set of resources has been developed for Functional Mathematics Level 4.

A team from the National Adult Literacy Agency (NALA) and the National Centre for Excellence in Mathematics and Science Teaching and Learning (NCEMS-TL) developed and edited the materials.

NALA:

Bláthnaid Ní Chinnéide
Mary Gaynor
Fergus Dolan
John Stewart
Dr Terry Maguire (Institute of Technology, Tallaght)

NCEMS-TL:
Prof. John O'Donoghue
Dr. Mark Prendergast
Dr. Miriam Liston
Dr. Niamh O'Meara

FÁS:
John O Neill
Louise MacAvin

We are grateful to Kathleen Cramer and her team in Newbridge Youth Training and Development Centre who gave feedback on extracts from the Level 3 materials.

April 2012

Contents

Activity Number	Activity	Learning Outcome	Page Number
A1	Profits of a business	2.1, 2.2, 2.4, 2.5.	4
A2	How many All- Ireland championships?	2.1, 2.2, 2.3, 2.4	8
A3	The bench press	2.1, 2.2, 2.3, 2.5.	12
A4	How many number 1 hits had Elvis Presley?	2.1, 2.2, 2.3, 2.4, 2.5.	16
A5	How wide is that bed?	2.1, 2.2, 2.3, 2.4, 2.5.	20
A6	How old is that singer?	2.1, 2.2, 2.3, 2.4, 2.5	24
A7	How many text messages can I send?	2.1, 2.2, 2.3, 2.5.	28
A8	How much is a ticket?	2.1, 2.2, 2.3, 2.4, 2.5	32

Tutor Guidelines for Activity A1: Profits of a business

Activity Profits of a business A1

This activity links to **award learning outcomes** **2.1, 2.2, 2.4** and **2.5.**

Learning Outcomes

1. Explain basic algebra and its application to everyday life
2. Demonstrate an understanding of the language and concepts of algebra
3. Write algebraic expressions for real – life examples
4. Solve a selection of algebraic problems based on real – life examples.

Key Learning Points

1. Defining algebra using simple terminology
2. Examining examples of real – life situations in which algebra is used
3. Recognising the benefits of algebra in everyday life
4. Understanding the language of algebra
5. Understanding common terms used in algebra such as variable, constant, coefficient, term, like term, expression, and product
   Understanding the concepts of algebra
6. Developing a glossary of algebraic terms
7. Writing algebraic expressions
8. Constructing algebraic expression of problem

Materials you will need for this activity

- Practice Sheet A1
- Solution Sheet A1

Tutor Guidelines for Activity A1: Profits of a business

Activity A1 aims to introduce learners to basic concepts, language and procedures of algebra.

Before the session

- Read through the relevant section in the Learner Pack. Try out the exercises. Look out for **key mathematical words** and concepts that may be new or unfamiliar to your learners. Plan what you and the learners will do to get to know and use those mathematical terms. In this activity learners will be introduced to many algebraic terms. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the language and concepts of algebra. Do the same preparation in relation to any other key words in this part of the Learner Pack that you think may be new or unfamiliar to your learners.

- The activities and tasks in the Learner Pack are examples**.** As far as possible use topics and activities that relate to your learners' own interests, needs or goals. Consult with colleagues in the centre to identify relevant tasks and topics from the learners' other subjects or from their work placements. Plan activities that integrate the teaching and learning of maths with learning from those other subjects and activities.

Guiding the learners through the Activity

- Explain what the learners will be able to do after this activity.

Tutor Guidelines for Activity A1: Profits of a business

- Ask learners what they understand by 'business' and 'profit'. Ask learners for their experience and views.

- Explain that Algebra is an important topic within mathematics and everyday life. Algebra is often considered to be the language of mathematics. It involves writing problems mathematically using variables to represent unknown values.

- Ask learners what they already know about algebra. Facilitate learners to think about and name what they know about algebra and where they use it in their own lives. They could do this in pairs or groups.

- Use pairs, small group work and whole group work as well as individual work, according to your judgement of what would work best to involve your learners actively.

- Facilitate the group to build a group **glossary** of mathematical and algebraic terms which they can add to throughout this Unit.

- Encourage individual learners to keep a **personal dictionary** of new words they want to be able to use, read, write and spell.

- **Explain** the procedures with reference to the examples. Use focused questioning and other methods to check understanding at each stage.

- **Demonstrate** the procedures by working through the **Worked Example** on the whiteboard or flipchart. Ask learners to **talk you through** the steps, with reference to their pack.

- Invite the learners to **join with you in writing each step** of the example, and as they write to **say** what they and you are writing and what it means.

Tutor Guidelines for Activity A1: Profits of a business

- The Worked Example is followed by **tasks** which allow learners to put their newly learned skills into practice. Explain the use of the word 'allow' in the instruction. In the language of algebra, we often use 'allow' or 'let': for example, 'allow x to represent the number of people in this group'; or 'let y equal the number of goals we scored'.

- In these tasks the learners must firstly allow a variable to represent an unknown value. Then they must write an algebraic expression to show the profit of the business.

- Monitor and support learners as they carry out the tasks. Encourage **questions** and **focused discussion**.

- Provide **feedback** to learners on the tasks they have carried out. Highlight the specific procedures and understandings they applied in the task. Use errors or gaps to identify and address specific points that need to be clarified or further practised.

- In the 'Practise your skills' section, the learners get an example of an algebraic sequence where a set of numbers repeat in a predictable manner. They are then given three examples where they must identify what each variable stands for in the sequence.

- The final part of this activity is the Practice Sheet A1 which allows learners to develop their algebraic language and skills in writing algebraic expressions for real life examples.

Tutor Guidelines for Activity A2: How many All-Ireland championships?

Activity **How many** **A2**

All – Ireland championships?

This activity links to **award learning outcomes** **2.1, 2.2, 2.3** and **2.4.**

Learning Outcomes

1. Explain basic algebra and its application to everyday life.
2. Demonstrate an understanding of the language and concepts of algebra.
3. Solve a selection of algebraic problems to include simple equations.
4. Write algebraic expressions for real – life examples.

Key Learning Points

1. Examining examples of real – life situations in which algebra is used
2. Recognising the benefits of algebra in everyday life
3. Understanding the language of algebra
4. Understanding common terms used in algebra such as variable and equation
5. Understanding the concepts of algebra
6. Developing a glossary of algebraic terms
7. Building simple equations
8. Expressing 'stories' as mathematical sentences

Materials you will need for this activity

- Practice Sheet A2
- Solution Sheet A2

Tutor Guidelines for Activity A2: How many All-Ireland championships?

Activity A2 aims to further develop learners' understanding and use of basic concepts, language and procedures of algebra.

Before the session

- Read through the relevant section in the Learner Pack. Try out the exercises. Look out for **key mathematical words** and concepts that may be new or unfamiliar to your learners. Plan what you and the learners will do to get to know and use those mathematical terms. In this activity learners will be introduced to many algebraic terms. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the language and concepts of algebra. Do the same preparation in relation to any other key words in this part of the Learner Pack that you think may be new or unfamiliar to your learners.

- The activities and tasks in the Learner Pack are examples**.** As far as possible use topics and activities that relate to your learners' own interests, needs or goals. Consult with colleagues in the centre to identify relevant tasks and topics from the learners' other subjects or from their work placements. Plan activities that integrate the teaching and learning of maths with learning from those other subjects and activities.

Guiding the learners through the Activity

- Explain what the learners will be able to do after this activity.

- Ask learners what they already know about the All-Ireland Championships. Encourage them to share their experience and views.

Tutor Guidelines for Activity A2: How many All-Ireland championships?

Explain that the All-Ireland is the premier competition in GAA and is contested in both hurling and football by competing counties.

- Ask learners what they already know about equations. Ask learners to list what they know about equations and where they may need to use them in their own lives. They could do this in pairs or groups.

- Before undertaking the activity, explain to the learners that an equation is like a balance scale. Everything must be equal on both sides. For example; 2 + 3 + 6 = 11.

- You will be introducing some new algebraic terms such as equations. Facilitate the group to build a group **glossary** of mathematical and algebraic terms which they can add to throughout this Unit.

- Encourage individual learners to keep a **personal dictionary** of new words they want to be able to use, read, write and spell.

- Use pairs, small group work and whole group work as well as individual work, according to your judgement of what would work best to involve your learners actively.

- **Explain** the procedures with reference to the examples. Use focused questioning and other methods to check understanding at each stage.

- **Demonstrate** the procedures by working through the **Worked Example** on the whiteboard or flipchart. Ask learners to **talk you through** the steps, with reference to their pack.

- Invite the learners to **join with you in writing each step** of the example, and as they write to **say** what they and you are writing and what it means.

Tutor Guidelines for Activity A2: How many All-Ireland championships?

- The Worked Example is followed by **tasks** which allow learners to put their newly learned skills into practice. In the tasks, the learners must translate sentences that describe a problem into equations that model the problem. These sentences are based on the number of All – Irelands certain counties have won in both hurling and football.

- Monitor and support learners as they carry out the tasks. Encourage **questions** and **focused discussion**.

- Provide **feedback** to learners on the tasks they have carried out. Highlight the specific procedures and understandings they applied in the tasks. Use errors or gaps to identify and address specific points that need to be clarified or further practised.

- In the 'Practise your skills' section, the learners are given an extra example. Here they must allow a variable to represent the number of units used and build an equation of working out an electricity bill.

- The final part of this activity is Practice Sheet A2 which allows learners to develop their skills in building linear equations.

Tutor Guidelines for Activity A3: The bench press

Activity The bench press A3

This activity links to **award learning outcomes** **2.1, 2.2, 2.3** and **2.5.**

Learning Outcomes

1. Explain basic algebra and its application to everyday life
2. Demonstrate an understanding of the language and concepts of algebra
3. Solve a selection of algebraic problems to include simple equations
4. Solve a selection of algebraic problems based on real – life situations.

Key Learning Points

1. Examining examples of real – life situations in which algebra is used
2. Recognising the benefits of algebra in everyday life
3. Understanding the concepts of algebra
4. Solving simple equations
5. Solving selection of algebraic problems

Materials you will need for this activity

- Practice Sheet A3
- Solution Sheet A3

Tutor Guidelines for Activity A3: The bench press

Activity A3 aims to further develop learners' understanding and use of basic concepts, language and procedures of algebra.

Before the session

- Read through the relevant section in the Learner Pack. Try out the exercises. Look out for **key mathematical words** and concepts that may be new or unfamiliar to your learners. Plan what you and the learners will do to get to know and use those mathematical terms. In this activity learners will be introduced to many algebraic terms. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the language and concepts of algebra. Do the same preparation in relation to any other key words in this part of the Learner Pack that you think may be new or unfamiliar to your learners.

- The activities and tasks in the Learner Pack are examples**.** As far as possible use topics and activities that relate to your learners' own interests, needs or goals. Consult with colleagues in the centre to identify relevant tasks and topics from the learners' other subjects or from their work placements. Plan activities that integrate the teaching and learning of maths with learning from those other subjects and activities.

Guiding the learners through the Activity

- Recap on the concept of an equation. From the previous activity learners should be aware that an equation is a mathematical sentence with an equals sign (=) stating that two expressions are equal.

- Explain what the learners will be able to do after this activity.

Tutor Guidelines for Activity A3: The bench press

- Ask learners what they already know about what a bench press is and how it is used. You could set a task for them to look up the apparatus on the internet before you go through the activity. Learners also need to be aware of the importance of having an equal amount of weight on each side of the bar. This is vital for balance and also ensures a similar build-up of muscle on both sides of the body.

- Introduce learners to the concept of solving equations. An equation is like a balance scale. Everything must be equal on both sides. Highlight the 'Golden Rule': Whatever we do to one side of the equation, we must do to the other side.

- You will be introducing some new algebraic terms. Facilitate the group to build a group **glossary** of mathematical and algebraic terms which they can add to throughout this Unit.

- Encourage individual learners to keep a **personal dictionary** of new words they want to be able to use, read, write and spell.

- Use pairs, small group work and whole group work as well as individual work, according to your judgement of what would work best to involve your learners actively.

- **Explain** the procedures with reference to the examples.

- **Demonstrate** the procedures by working through the **Worked Example** on the whiteboard or flipchart. Ask learners to **talk you through** the steps, with reference to their pack.

- Invite the learners to **join with you in writing each step** of the example, and as they write to **say** what they and you are writing and what it means.

Tutor Guidelines for Activity A3: The bench press

- Following the Worked Example there are tasks which allow learners to put their newly learned skills into practice. In the tasks the learners must solve equations based on real life examples by isolating the variable on one side of the equals sign.
- Monitor and support learners as they carry out the tasks. Encourage **questions** and **focused discussion**.
- Provide **feedback** to learners on the tasks they have carried out. Highlight the specific procedures and understandings they applied in the tasks. Use errors or gaps to identify and address specific points that need to be clarified or further practised.
- In the 'Practise your skills' section, the learners are given an extra example. Here they must solve an equation based on the popular TV show 'X – Factor'.
- The final part of this activity is Practice Sheet A3 which allows learners to develop their skills in solving linear equations.

Tutor Guidelines for Activity A4: How many number 1 hits had Elvis Presley?

Activity **A4**

How many number 1 hits had Elvis Presley?

This activity links to **award learning outcomes** **2.1, 2.2, 2.3, 2.4** and **2.5.**

Learning Outcomes

1. Explain basic algebra and its application to everyday life
2. Demonstrate an understanding of the language and concepts of algebra
3. Solve a selection of algebraic problems to include simple equations
4. Write algebraic expressions for real-life examples
5. Solve a selection of algebraic problems based on real – life situations.

Key Learning Points

1. Examining examples of real – life situations in which algebra is used
2. Recognising the benefits of algebra in everyday life
3. Understanding the concepts of algebra
4. Building simple equations
5. Solving simple equations
6. Expressing ‘stories’ as mathematical sentences
7. Solving selection of algebraic problems

Materials you will need for this activity

- Practice Sheet A4
- Solution Sheet A4

Tutor Guidelines for Activity A4: How many number 1 hits had Elvis Presley?

Activity A4 aims to further develop the concept of building and solving algebraic equations.

Before the session

- Read through the relevant section in the Learner Pack. Try out the exercises. Look out for **key mathematical words** and concepts that may be new or unfamiliar to your learners. Plan what you and the learners will do to get to know and use those mathematical terms. In this activity learners will be introduced to many algebraic terms. Plan discussion, focused quizzes, games, worksheets, word-walls and/or any other activities that will help your learners to use and understand the language and concepts of algebra. Do the same preparation in relation to any other key words in this part of the Learner Pack that you think may be new or unfamiliar to your learners.

- The activities and tasks in the Learner Pack are examples**.** As far as possible use topics and activities that relate to your learners' own interests, needs or goals. Consult with colleagues in the centre to identify relevant tasks and topics from the learners' other subjects or from their work placements. Plan activities that integrate the teaching and learning of maths with learning from those other subjects and activities.

Guiding the Learners through the Activity

- Before undertaking the activity, facilitate learners to recap on their learning from A2: What is a variable? How do you construct an

Tutor Guidelines for Activity A4: How many number 1 hits had Elvis Presley?

equation? Check learners know that in order to construct an algebraic equation for a real life situation they must allow a variable to stand for the unknown value and must construct the equation around this. Then recap on their learning from A3, on solving algebraic equations.

- Explain what the learners will be able to do after this activity.
- Facilitate the group to build a group **glossary** of mathematical and algebraic terms which they can add to throughout this Unit.
- Encourage individual learners to keep a **personal dictionary** of new words they want to be able to use, read, write and spell.
- Use pairs, small group work and whole group work as well as individual work, according to your judgement of what would work best to involve your learners actively.
- Ask learners what they already know about Elvis Presley and facilitate them to share their knowledge and views. Elvis Presley was one of the most popular American singers of the 20th century. A cultural icon, he is often referred to as the "King of Rock and Roll" or simply "the King". To this day, he remains one of the most critically acclaimed and commercially successful singers in history. He had many Number 1 hits in many countries.
- **Explain** the procedures with reference to the examples.
- **Demonstrate** the procedures by working through the **Worked Example** on the whiteboard or flipchart. Ask learners to **talk you through** the steps, with reference to their pack.

Tutor Guidelines for Activity A4: How many number 1 hits had Elvis Presley?

- Invite the learners to **join with you in writing each step** of the example, and as they write to **say** what they and you are writing and what it means.

- Following the Worked Example there are tasks which allow learners to put their newly learned skills into practice.

- Monitor and support learners as they carry out the tasks. Encourage **questions** and **focused discussion**.

- Provide **feedback** to learners on the tasks they have carried out. Highlight the specific procedures and understandings they applied in the tasks. Use errors or gaps to identify and address specific points that need to be clarified or further practised.

- In the 'Practise your skills' section, the learners are given an extra example. Here they must build and solve an equation based on the popular rock band U2. Learners must calculate how many Grammy Awards U2 have. Before attempting the task, you might ask the learners how many of them like U2. Have any of them ever been to a U2 concert? What is their favourite U2 song?

- The final part of this activity is Practice Sheet A4 which allows learners to further develop their skills in building and solving algebraic equations.

Tutor Guidelines for Activity A5: How wide is that bed?

Activity How wide is that bed? A5

This activity links to **award learning outcomes** **2.1, 2.2, 2.3, 2.4** and **2.5.**

Learning Outcomes

1. Explain basic algebra and its application to everyday life
2. Demonstrate an understanding of the language and concepts of algebra
3. Solve a selection of algebraic problems to include simple equations
4. Write algebraic expressions for real-life examples
5. Solve a selection of algebraic problems based on real – life situations.

Key Learning Points

1. Examining examples of real – life situations in which algebra is used
2. Recognising the benefits of algebra in everyday life
3. Understanding the concepts of algebra
4. Building simple equations
5. Solving simple equations
6. Expressing ‘stories’ as mathematical sentences
7. Solving selection of algebraic problems

Materials you will need for this activity

- Practice Sheet A5
- Solution Sheet A5

Tutor Guidelines for Activity A5: How wide is that bed?

Activity A5 aims to further develop the concept of building and solving algebraic equations.

Before the session

- Read through the relevant section in the Learner Pack. Try out the exercises. Look out for **key mathematical words** and concepts that may be new or unfamiliar to your learners. Plan what you and the learners will do to get to know and use those mathematical terms. In this activity learners will be introduced to many algebraic terms. Plan discussion, focused quizzes, games, worksheets, constructing word-walls, and/or any other activities that will help your learners to use and understand the language and concepts of algebra. Do the same preparation in relation to any other key words in this part of the Learner Pack that you think may be new or unfamiliar to your learners.

- The activities and tasks in the Learner Pack are examples**.** As far as possible use topics and activities that relate to your learners' own interests, needs or goals. Consult with colleagues in the centre to identify relevant tasks and topics from the learners' other subjects or from their work placements. Plan activities that integrate the teaching and learning of maths with learning from those other subjects and activities.

Guiding the learners through the Activity

- Recap on previous activities on building and solving equations.

- Explain what the learners will be able to do after this activity.

Tutor Guidelines for Activity A5: How wide is that bed?

- Before undertaking the activity, ask learners what do they already know about ‘perimeter’. Facilitate learners to express what they know about this.

- Explain that the perimeter is the total distance or the length around the outside of a shape. Calculating the perimeter has considerable practical applications. The perimeter is used to calculate the length of a fence required to surround a yard or garden. The perimeter can be calculated by the formula: 2(width) + 2(length). Ask the learners to find the perimeter of certain objects in the classroom, for example the perimeter of their desk.

- Remind learners that bed size refers to the dimensions of a mattress and the names by which standard sizes are called. The three main types of bed size in Ireland are single, double and king size.

- You will be introducing new words. Facilitate the group to build a group glossary of mathematical and algebraic terms which they can add to throughout this Unit.

- Encourage individual learners to keep a personal dictionary of new words they want to be able to use, read, write and spell.

- Use pairs, small group work and whole group work as well as individual work, according to your judgement of what would work best to involve your learners actively.

- **Explain** the procedures with reference to the examples.

Tutor Guidelines for Activity A5: How wide is that bed?

- **Demonstrate** the procedures by working through the **Worked Example** on the whiteboard or flipchart. Ask learners to **talk you through** the steps, with reference to their pack.

- Invite the learners to **join with you in writing each step** of the example, and as they write to **say** what they and you are writing and what it means.

- Following the Worked Example there are tasks which allow learners to put their newly learned skills into practice. In the tasks the learners must build and solve equations based on real life examples.

- Monitor and support learners as they carry out the tasks. Encourage **focused questions** and **discussion**.

- Provide **feedback** to learners on the tasks they have carried out. Highlight the specific procedures and understandings they applied in the tasks. Use errors or gaps to identify and address specific points that need to be clarified or further practised.

- In the 'Practise your skills' section, the learners are given an extra example. Here they must build and solve an equation based on the length of a basketball court. Before attempting the task, you might ask the learners whether any of them play basketball. What are the rules of the game? How many players are on each team?

- The final part of this activity is Practice Sheet A5 which allows learners to further develop their skills in building and solving algebraic equations.

Tutor Guidelines for Activity A6: How old is that singer?

Activity How old is that singer? A6

This activity links to **award learning outcomes** **2.1, 2.2, 2.3, 2.4** and **2.5.**

Learning Outcomes

1. Explain basic algebra and its application to everyday life
2. Demonstrate an understanding of the language and concepts of algebra
3. Solve a selection of algebraic problems to include simple equations
4. Write algebraic expressions for real-life examples
5. Solve a selection of algebraic problems based on real – life situations.

Key Learning Points

1. Examining examples of real – life situations in which algebra is used
2. Recognising the benefits of algebra in everyday life
3. Understanding the concepts of algebra
4. Building simple equations
5. Solving simple equations
6. Expressing ‘stories’ as mathematical sentences
7. Solving selection of algebraic problems

Materials you will need for this activity

- Practice Sheet A6
- Solution Sheet A6

Tutor Guidelines for Activity A6: How old is that singer?

Activity A6 aims to further develop the concept of building and solving algebraic equations.

Before the session

- Read through the relevant section in the Learner Pack. Try out the exercises. Look out for **key mathematical words** and concepts that may be new or unfamiliar to your learners. Plan what you and the learners will do to get to know and use those mathematical terms. In this activity learners will be introduced to many algebraic terms. Plan discussion, focused quizzes, games, worksheets, constructing word-walls, and/or any other activities that will help your learners to use and understand the language and concepts of algebra. Do the same preparation in relation to any other key words in this part of the Learner Pack that you think may be new or unfamiliar to your learners.

- The activities and tasks in the Learner Pack are examples**.** As far as possible use topics and activities that relate to your learners' own interests, needs or goals. Consult with colleagues in the centre to identify relevant tasks and topics from the learners' other subjects or from their work placements. Plan activities that integrate the teaching and learning of maths with learning from those other subjects and activities.

Guiding the learners through the Activity

- Recap on previous activities on building and solving equations. In order to construct an algebraic equation for a real life situation learners will allow a variable to stand for the unknown value and will construct

Tutor Guidelines for Activity A6: How old is that singer?

the equation around this. Once the equation is constructed, it is solved using algebraic procedures to isolate the variable on one side of the equals sign.

- Explain what the learners will be able to do after this activity.
- Facilitate the group to build a group **glossary** of mathematical and algebraic terms which they can add to throughout this Unit.
- Encourage individual learners to keep a **personal dictionary** of new words they want to be able to use, read, write and spell.
- Use pairs, small group work and whole group work as well as individual work, according to your judgement of what would work best to involve your learners actively.
- **Explain** the procedures with reference to the examples.
- **Demonstrate** the procedures by working through the **Worked Example** on the whiteboard or flipchart. Ask learners to **talk you through** the steps, with reference to their pack.
- Invite the learners to **join with you in writing each step** of the example, and as they write to **say** what they and you are writing and what it means.
- Following the Worked Example there are tasks which allow learners to put their newly learned skills into practice. In the tasks the learners must build and solve equations based on real life examples.
- Monitor and support learners as they carry out the tasks. Encourage **questions** and **focused discussion**.

Tutor Guidelines for Activity A6: How old is that singer?

- Provide **feedback** to learners on the tasks they have carried out. Highlight the specific procedures and understandings they applied in the tasks. Use errors or gaps to identify and address specific points that need to be clarified or further practised.

- The final part of this activity is Practice Sheet A6 which allows learners to further develop their skills in building and solving more complex algebraic equations.

Tutor Guidelines for Activity A7: How many text messages can I send?

Activity How many text messages can I send? A7

This activity links to **award learning outcomes** 2.1, 2.2, 2.3 and 2.5.

Learning Outcomes

1. Explain basic algebra and its application to everyday life
2. Demonstrate an understanding of the language and concepts of algebra
3. Solve a selection of algebraic problems to include simple inequalities of one variable
4. Solve a selection of algebraic problems based on real – life situations.

Key Learning Points

1. Examining examples of real – life situations in which algebra is used
2. Recognising the benefits of algebra in everyday life
3. Demonstrating an understanding of the language of algebra
4. Understanding common terms used in algebra such as inequality
5. Demonstrating an understanding of the concepts of algebra
6. Tracing an equation back to real life example
7. Developing a glossary of algebraic terms
8. Asking what inequalities are?
9. Solving inequalities of one variable
10. Solving a selection of algebraic problems

Materials you will need for this activity

- Practice Sheet A7
- Solution Sheet A7

Tutor Guidelines for Activity A7: How many text messages can I send?

Activity A7 aims to further develop learners' understanding and use of basic concepts, language and procedures of algebra.

Before the session

- Read through the relevant section in the Learner Pack. Try out the exercises. Look out for **key mathematical words** and concepts that may be new or unfamiliar to your learners. Plan what you and the learners will do to get to know and use those mathematical terms. In this activity learners will be introduced to many algebraic terms. Plan discussion, focused quizzes, games, worksheets, constructing word-walls, and/or any other activities that will help your learners to use and understand the language and concepts of algebra. Do the same preparation in relation to any other key words in this part of the Learner Pack that you think may be new or unfamiliar to your learners.

- The activities and tasks in the Learner Pack are examples**.** As far as possible use topics and activities that relate to your learners' own interests, needs or goals. Consult with colleagues in the centre to identify relevant tasks and topics from the learners' other subjects or from their work placements. Plan activities that integrate the teaching and learning of maths with learning from those other subjects and activities.

Guiding the Learners through Activity A7

- Recap on learning from the previous session.

- Explain what the learner will be able to do after this activity.

Tutor Guidelines for Activity A7: How many text messages can I send?

- Ask learners what they already know about inequalities. Encourage them to list what they know about inequalities. They could do this In pairs or groups. Then discuss where they may need to use or solve them in their own lives.

- Before undertaking the activity, explain to learners the differences between an equation and an inequality. The inequality signs and their meaning must be made clear.

- Ask learners to share their experience of mobile phone prices. Point out that Meteor, Vodafone and 02 are three of the largest mobile communication networks in Ireland. Each network currently has a new value plan. These plans allow their customers, to make unlimited calls and send a limited number of text messages for a fixed price per month.

- You will be introducing new mathematical words to the learners. Facilitate the group to build a group **glossary** of mathematical and algebraic terms which they can add to throughout this Unit.

- Encourage individual learners to keep a **personal dictionary** of new words they want to be able to use, read, write and spell.

- Use pairs, small group work and whole group work as well as individual work, according to your judgement of what would work best to involve your learners actively.

- **Explain** the procedures with reference to the examples.

- There is a **Worked Example** where the learner must choose which inequality sign is appropriate for the situation and hence solve the inequality. **Demonstrate** the procedures by working through the

Tutor Guidelines for Activity A7: How many text messages can I send?

Worked Example on the whiteboard or flipchart. Ask learners to **talk you through** the steps, with reference to their pack.

- Invite the learners to **join with you in writing each step** of the example, and as they write to **say** what they and you are writing and what it means.

- Following the Worked Example there are two tasks for the learner to complete which mirror this example.

- Monitor and support learners as they carry out the tasks. Encourage **questions** and **focused discussion**.

- Provide **feedback** to learners on the tasks they have carried out. Highlight the specific procedures and understandings they applied in the tasks. Use errors or gaps to identify and address specific points that need to be clarified or further practised.

- The final part of this activity is Practice Sheet A7 which allows learners to develop their skills in solving inequalities.

Tutor Guidelines for Activity A8: How much is a ticket?

Activity How much is a ticket? A8

This activity links to **award learning outcomes** 2.1, 2.2, 2.3, 2.4 and 2.5

Learning Outcomes

1. Explain basic algebra and its application to everyday life
2. Demonstrate an understanding of the language and concepts of algebra
3. Solve a selection of algebraic problems to include simultaneous equations
4. Write algebraic expressions for real life examples
5. Solve a selection of algebraic problems based on real – life situations.

Key Learning Points

1. Examining examples of real – life situations in which algebra is used
2. Recognising the benefits of algebra in everyday life
3. Demonstrating an understanding of the language of algebra
4. Understanding common terms used in algebra such as simultaneous equations
5. Demonstrating an understanding of the concepts of algebra
6. Developing a glossary of algebraic terms
7. Asking what simultaneous equations are
8. Solving simultaneous equations
9. Expressing ‘stories’ as mathematical sentences
10. Solving selection of algebraic problems.

Materials you will need for this activity

- Practice Sheet A8
- Solution Sheet A8

Tutor Guidelines for Activity A8: How much is a ticket?

- **Activity A8** aims to introduce the concept of solving simultaneous equations.

Before the session

- Read through the relevant section in the Learner Pack. Try out the exercises. Look out for **key mathematical words** and concepts that may be new or unfamiliar to your learners. Plan what you and the learners will do to get to know and use those mathematical terms. In this activity learners will be introduced to many algebraic terms. Plan discussion, focused quizzes, games, worksheets, constructing word-walls, and/or any other activities that will help your learners to use and understand the language and concepts of algebra. Do the same preparation in relation to any other key words in this part of the Learner Pack that you think may be new or unfamiliar to your learners.

- The activities and tasks in the Learner Pack are examples**.** As far as possible use topics and activities that relate to your learners' own interests, needs or goals. Consult with colleagues in the centre to identify relevant tasks and topics from the learners' other subjects or from their work placements. Plan activities that integrate the teaching and learning of maths with learning from those other subjects and activities.

Guiding the Learners through Activity A8

- Explain what the learners will be able to do after this activity.

- Ask learners what they already know about simultaneous equations. In pairs or groups, learners might list what they know about simultaneous

Tutor Guidelines for Activity A8: How much is a ticket?

equations and where they may need to use or solve them in their own lives.

- Before undertaking the activity, learners need to know that simultaneous equations are two equations with at least two unknowns (x and y). In order to solve such equations they must be simultaneously satisfied by particular values of x and y.

- Learners also need to be aware that there are different prices charged for standing tickets and for seated tickets in stadiums such as Croke Park and the Aviva. In the cinema there are also different prices charged for an adult ticket and for a student ticket. Facilitate learners to share their experience and views on ticket prices.

- You will be introducing new mathematical words to the learners. Facilitate the group to build a group **glossary** of mathematical and algebraic terms which they can add to throughout this Unit.

- Encourage individual learners to keep a **personal dictionary** of new words they want to be able to use, read, write and spell.

- Use pairs, small group work and whole group work as well as individual work, according to your judgement of what would work best to involve your learners actively.

- **Explain** the procedures with reference to the examples.

- **Demonstrate** the procedures by working through the **Worked Example** on the whiteboard or flipchart. Ask learners to **talk you through** the steps, with reference to their pack.

- Invite the learners to **join with you in writing each step** of the

Tutor Guidelines for Activity A8: How much is a ticket?

example, and as they write to **say** what they and you are writing and what it means.

- Following the Worked Example there are two tasks where the learner must solve simultaneous equations based on real life examples.

- Monitor and support learners as they carry out the tasks. Encourage **questions** and **focused discussion**.

- Provide **feedback** to learners on the tasks they have carried out. Highlight the specific procedures and understandings they applied in the tasks. Use errors or gaps to identify and address specific points that need to be clarified or further practised.

- In the 'Practiseyour Skills' section, the learners are given an extra example where they must calculate how many MB in a song and how many MB in a video based on what an iPod can hold. It must be made clear to learners from the outset that there are 1000MB in 1 GB. Before attempting the task, you might ask the learners how many of them have an iPod. What GB is it? Hence what MB is it?

- The final part of this activity is the Practice Sheet A8 which allows learners to further develop their skills in solving simultaneous equations.

NDP
National Development Plan
Transforming Ireland

FÁS
Foras Áiseanna Saothair
Training & Employment Authority

Ireland's EU Structural Funds
Programmes 2007 - 2013

Co-funded by the Irish Government
and the European Union

EUROPEAN SOCIAL FUND