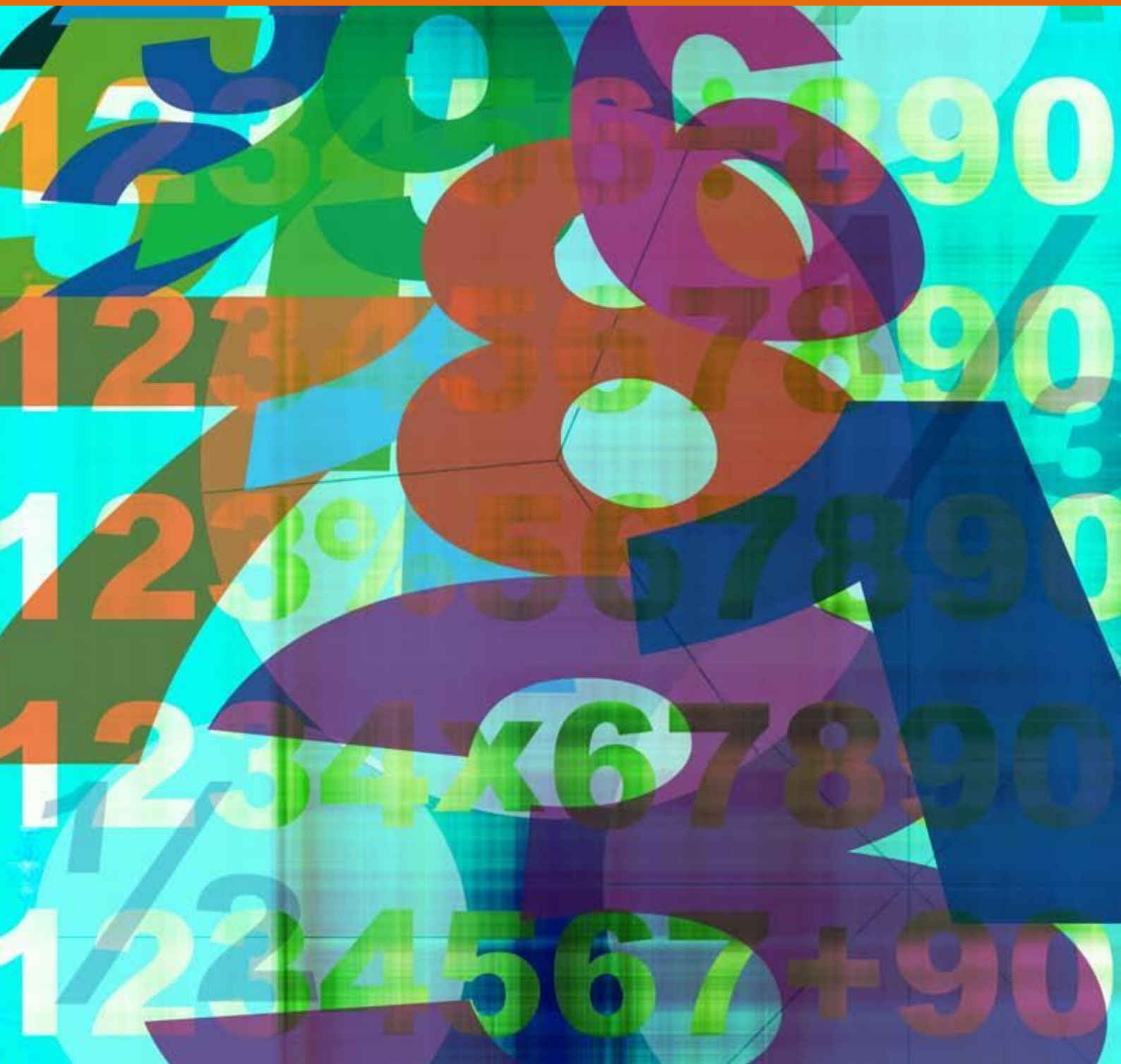
Tutor Guidelines

Functional Mathematics

Level 3 Unit 1: Number



Functional Mathematics - Level 3 – Unit 1 - Number

Tutor Guidelines

Acknowledgements

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Contents

Tutor Guidelines for Activity N1: Using the calculator

Activity Using the calculator N1

This activity links to **award learning outcome 1.4.**

Learning Outcomes

1. Use a calculator to perform common mathematical functions, to include use of +, -, × and ÷.

Key Learning Points

1. Using a calculator
2. Using the function keys on a calculator
3. Adding, subtracting, multiplying and dividing using a calculator
4. Solving numerical problems for up to 4 digit numbers with a calculator
5. Adding to or subtracting from totals using a calculator
6. Using the clear function key

Materials you will need for this activity

- Calculator
- Practice Sheet N1
- Solution Sheet N1

Tutor Guidelines for Activity N1: Using the calculator

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N1: Using the calculator

Guiding the learners through the Activity

- Explain what the learners will be able to do after this activity. The aim is to do addition, subtraction, multiplication and division on the calculator.

- Many of the learners may be familiar with using calculators. Use discussion to determine how much the learners already know about calculators and the functions of the calculator.

- Learners will have different calculators and you may need to show them, or ask them to show each other, specifics such as where the plus or minus buttons are.

- After this activity the learners should be competent using a calculator for addition, subtraction, multiplication and division. It is also important to encourage them not to rely on their calculator alone. Even if we have a calculator we need to know how to add or subtract. Encourage learners to work out or calculate in their heads before using the calculator.

- Throughout this programme, encourage learners to use the calculator to check their own calculations.

- 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 terms.

- Make, or encourage learners to collectively make, a wordwall of key terms used within each new maths topic. Use a range of activities to

Tutor Guidelines for Activity N1: Using the calculator

help learners focus on, use and understand those terms. Change the words displayed according to each new topic.

- Encourage learners to keep a personal dictionary.
- Use Practice Sheet N1

Tutor Guidelines for Activity N2: Playing darts

Activity # Playing darts **N2**

This activity links to **award learning outcomes** **1.1.** and **1.4.**

Learning Outcomes

1. Use natural numbers (N) in basic mathematical functions, drawn from real life situations.
2. Use a calculator to perform common mathematical functions to include use of +.

Key Learning Points

1. Understanding the basic mathematical functions
2. Identifying natural numbers (N)
3. Adding 1, 2 and 3 digit numbers without a calculator
4. Applying mathematical solutions to real life situations
5. Adding using a calculator

Materials you will need for this activity

- A darts board or a picture of a darts board
- Calculator
- Practice Sheet N2
- Solution Sheet N2

Tutor Guidelines for Activity N2: Playing darts

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N2: Playing darts

Guiding the learners through the Activity

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

- Set the real life context for the learners. Activity N2 is based on the game of darts. Facilitate group discussion on the topic of darts. What personal experience do the learners have of this game? What do they know about professional darts - do they follow it? Encourage learners to find out the rules by searching the internet or by asking a friend or staff member who knows how to play darts. You could ask for a volunteer to explain the rules of the game to the group.

- Introduce the term natural numbers. Ask learners to say what they already know about this. For example, ask them to show any natural numbers they can see around them. Ask them to list all the natural numbers they might have seen so far that day.

- Explain that natural numbers are always whole, positive numbers. Check that learners understand what this means and recap or develop the concept if necessary. You can use a number line or a temperature gauge to illustrate the meaning of positive numbers. Use real life examples such as the temperature gauge in the fridge in the centre's kitchen. Stress that it is only the whole positive numbers that are 'natural' numbers. Point these out and give examples. Ask learners for other examples of positive whole numbers.

- Point out the mathematical symbols for positive and negative, and that the symbol for natural numbers is N.

Tutor Guidelines for Activity N2: Playing darts

- **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.

- Guide learners through the tasks in the Learner Pack.

Task 1: Adding natural numbers based on darts scores.

Language Tip: The segments on a darts board are called 'beds'.
Play a game of darts after the activity if the facilities are available to you. Or watch a game online or on a DVD. Take turns to keep score.

The scoring system in darts includes both addition and subtraction. Subtraction is covered in the next Activity. At this stage the main point is to practise addition of natural numbers.

In darts you can score 'double or treble' scores. Show the learners how you can calculate these scores through addition.

Task 2: Recognising natural numbers. This helps learners distinguish whole, positive numbers from negative numbers and from numbers with a fraction or a decimal point.

Tutor Guidelines for Activity N2: Playing darts

You could also use the extension activity 'Climbing a mountain in Peru'. That example builds a very similar maths challenge into learning about world geography and cultures. The specific topic is Peru. You can give this maths challenge to help learners practise addition skills at the same time as learning or reinforcing some points about the geography, history and culture of Peru. It also reinforces some of the key words in the subject of geography - for example, summit.

- Encourage learners to use the calculator to check their own calculations.

- 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 terms which they can add to throughout this Unit.

- Make, or encourage learners to make, a wordwall of key terms used within each new maths topic. Use a range of activities to help learners focus on, use and understand those terms. Change the words displayed according to each new topic.

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

- Practice sheet N2 gives practice in the addition of natural numbers. Encourage learners to do these without a calculator first, and to use their calculator to check their answers.

Tutor Guidelines for Activity N3: Battle of the provinces

Activity Battle of the provinces N3

This activity links to **award learning outcomes** 1.1. and 1.4.

Learning Outcomes

1. Use natural numbers (N) in basic mathematical functions, drawn from real life situations.
2. Use a calculator to perform common mathematical functions to include use of –.

Key Learning Points

1. Understanding the basic mathematical functions
2. Subtracting 1, 2 and 3 digit numbers without a calculator
3. Applying mathematical solutions to real life situations
4. Subtracting using a calculator

Materials you will need for this activity

- Practice Sheet N3
- Solution Sheet N3

Prior Learning

From N2 learners should be able to answer the following;

- What are natural numbers?
- What is the symbol used to represent natural numbers?
- Is zero a natural number?

Tutor Guidelines for Activity N3: Battle of the provinces

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N3: Battle of the provinces

Guiding the learners through the Activity

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

- Introduce the concept of subtraction of natural numbers through a discussion on rugby. If rugby is not of interest to your learners then change the activity to suit their interests: for example, using Gaelic football, hurling or basketball.

- Before asking them what they need to know, ask them what they already know from the last activity?

- Before undertaking the activity, confirm that learners have an idea of the rules of the game of rugby. You could set a task for them to look up the rules using the internet or ask a learner who already knows the rules to explain them to the other learners.

- **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 N3: Battle of the provinces

- After you explain and discuss the worked example, **ask learners to try Task 1 and Task 2 themselves**. You might like them to work in pairs to discuss their answers. Once learners have completed their tasks individually, ask them to explain their answer to their partner.
- Encourage learners to use the calculator to check their own calculations.
- 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 terms.
- Encourage individual learners to keep a **personal dictionary** of new words they want to be able to use, read, write and spell.
- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.
- Practice Sheet N3 gives practice in subtracting natural numbers.

Tutor Guidelines for Activity N4: Temperature

Activity Temperature N4

This activity links to **award learning outcome 1.1.**

Learning Outcomes

1. Use integers (Z) in basic mathematical functions, drawn from real life situations.

Key Learning Points

1. Identifying integers (Z)
2. Applying mathematical solutions to real life situations

Materials you will need for this activity

- Practice Sheet N4
- Solution Sheet N4

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

Tutor Guidelines for Activity N4: Temperature

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

- Introduce the concept of integers, particularly negative numbers, through the topics of weather and temperature.

- **Recap**: Ask learners what they already know about numbers? Are there any other types of numbers other than positive numbers? Where do they use negative numbers?

Tutor Guidelines for Activity N4: Temperature

- Introduce and explain the number line. Use the example of temperature here, for example, ask learners to place 12 degrees and -10 degrees on a number line. Discuss the difference in these temperatures.

- **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.

- After you explain and discuss the worked example, ask learners to try the Tasks themselves. You might like them to work in pairs to discuss their answers. Once learners have completed their tasks individually, ask them to explain their answer to their partner.

- In Task 1 learners must recognising natural integers. This helps learners distinguish whole numbers from numbers with a fraction or a decimal point.

- In Task 3, learners must interpret information recored by Met Eireann and use the data to answer a set of questions.

- Encourage learners to use the calculator to check their own calculations.

Tutor Guidelines for Activity N4: Temperature

- 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 terms.

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

- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Use Practice Sheet N4

Tutor Guidelines for Activity N5: Climate

Activity Climate N5

This activity links to **award learning outcome 1.1.**

Learning Outcomes

1. Use integers (Z) in basic mathematical functions, drawn from real life situations.

Key Learning Points

1. Adding and subtracting 1, 2 and 3 digit numbers without a calculator
2. Applying mathematical solutions to real life situations

Materials you will need for this activity

- Practice Sheet N5
- Solution Sheet N5

Prior Learning

- Learners need to be comfortable with the maths in Activities N1 – N4.
- Learners should be familiar with temperature and negative numbers from the previous activity N4.

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. Plan discussion, quizzes, games, worksheets and/or other activities to help

learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

- Recap on the previous activity with the group; ask some questions to check learning and understanding. Ask leanrers what they already know about negative and positive numbers? Where do they use negative

Tutor Guidelines for Activity N5: Climate

numbers? Can they think of further examples, in real life situations where both positive and negative numbers come into play?

- Before undertaking the activity, remind learners of the number line and how to add and subtract integers. Different climates will be used as the topic in this activity.

- Before doing the activity, you could ask learners to look up the current weather forecast, including countries with colder climates and you could have a whole group discussion about varying temperatures.

- **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.

- After you explain and discuss the activity, **ask learners to try some tasks themselves**, working out and discussing their answers in pairs.

- **Use other topics and situations** to reinforce the learning. For example, goal difference in the Premier League.

- Encourage learners to use the calculator to check their own calculations.

Tutor Guidelines for Activity N5: Climate

- 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 terms.

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

- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Use Practice Sheet N5. Remind leanrers not to use their calculator for these practice skills but that they can check their answers on a calculator.

Tutor Guidelines for Activity N6: Calorie intake

Activity # Calorie intake **N6**

This activity links to **award learning outcomes** **1.1.** and **1.4.**

Learning Outcomes

1. Use integers (Z) in basic mathematical functions, drawn from real life situations.
2. Use a calculator to perform common mathematical functions to include use of ×.

Key Learning Points

1. Understanding the basic mathematical functions
2. Adding and subtracting 1, 2 and 3 digit numbers without a calculator
3. Multiplying by single digit numbers without a calculator
4. Applying mathematical solutions to real life situations
5. Multiplying using a calculator

Materials you will need for this activity

- Practice Sheet N6
- Solution Sheet N6

Tutor Guidelines for Activity N6: Calorie intake

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N6: Calorie intake

Guiding the learners through the Activity

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

- Recap on learning in previous activities with the group, especially on integers.

- Introduce the concept of multiplication of integers with the same sign, either positive or negative. The activities highlight multiplication of positive integers. Emphasise during this section that when multiplying two numbers with same sign that the answer is always is positive.

- Before asking learners what they need to know, ask them what they already know about multiplying positive whole numbers? Do they know any sitiation where they might need to multiply positive whole numbers?

- Facilitate learners to research the recommended daily calorie intake for males and females and to understand how calories are consumed and burned up. This could be done through group or whole class discussion and by using the internet.

- **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.
- After you explain and discuss the worked example, ask learners to try

Tutor Guidelines for Activity N6: Calorie intake

the remaining tasks themselves. They could work in pairs to work out and discuss their answers.

- When learners are calculating daily calorie intake, advise them to use whole numbers only.
- Progress to helping learners to identify the **maths rule** which states that **when you multiply numbers with the same sign the answer will always be positive** and **when you multiply numbers with different signs the answer will always be negative**. Allow learners to practise this.
- Encourage learners to use the calculator to check their own calculations.
- 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 terms.
- Encourage individual learners to keep a **personal dictionary** of new words they want to be able to use, read, write and spell.
- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.
- Use Practice Sheet N6

Tutor Guidelines for Activity N7: Winning money

Activity # Winning money **N7**

This activity links to **award learning outcomes** **1.1.** and **1.4.**

Learning Outcomes

1. Use integers (Z) in basic mathematical functions, drawn from real life situations.
2. Use a calculator to perform common mathematical functions to include use of ÷.

Key Learning Points

1. Understanding the basic mathematical functions
2. Dividing by single digit numbers without a calculator
3. Applying mathematical solutions to real life situations
4. Dividing using a calculator

Materials you will need for this activity

- Practice Sheet N7
- Solution Sheet N7

Prior Learning

Learners should be familiar with the concept of integers. They include all positive and negative whole numbers. Z is the symbol used to represent them. Examples of integers include 0, 2, -2, 65, - 736, 10034.

Tutor Guidelines for Activity N7: Winning money

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N7: Winning money

Guiding the learners through the Activity

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

- Recap on what learners know from the previous activity.

- Before asking the learners what they need to know, ask them what they already know about dividing positive whole numbers? Do they know of any instances where they might need to divide positive whole numbers in their daily lives?

- Introduce the concept of division of integers with the same sign either positive or negative. Ask learners what they already know about dividing integers that have the same sign? The activity highlights division of positive integers. Emphasise, during this section, that the same applies to division as to multiplication as in N6, that is, when dividing two numbers with same sign the answer is always is positive.

- **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.

- After you explain and go through an example, ask learners to try the tasks themselves. They could work in pairs to work out and discuss

their answers.

- Progress, when you think learners are ready, to division of integers that have different signs: when we divide positive and negative numbers together. Ask learners if they know of any instances where they might need to divide a positive whole number by a negative whole number or vice versa? Discuss real life examples before introducing any rules. Help learners to understand why a negative number when divided by a positive number is still negative.

- Progress to the concept and the use of **division of positive and negative whole numbers, (**integers). Stress that **when dividing two numbers with different signs, then the answer is always negative.**

- 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 terms.

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

- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Use Practice Sheet N7.

Tutor Guidelines for Activity N8: Circles

Activity Circles N8

This activity links to **award learning outcome 1.1.**

Learning Outcomes

1. Use rational numbers (Q) in basic mathematical functions, drawn from real life situations.

Key Learning Points

1. Identifying rational numbers (Q)

Materials you will need for this activity

- The circle kit.
- Practice Sheet N8
- Solution Sheet N8

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible

during the session. Build in activities that **help learners speak** about

- **what they already know** about the topic and about the mathematics involved;
- their **experience** of the topic and of the real world maths involved
- their **opinions and suggestions** related to the activity, topic and the maths involved;
- their suggestions for **other ways of learning** the mathematics

- 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.

- In this activity your aim is to help learners identify and understand the concept of rational numbers and to be able to name and write fractions.

- Ask the learners if they know what a fraction is? Do they know another name for fractions? Do they know how to write fractions using symbols?

- Use the fraction circles in the resource pack.

Tutor Guidelines for Activity N8: Circles

- Before you start the tasks, ask learners to form groups of about 6 with one fraction kit for each group. Allow learners time to examine the kit. Ask them to make up as many single coloured circles as they can.

- This is followed by the **naming of fraction pieces** and the introduction of **symbolic representation**: for example, a half = $^1/_2$. You might decide to introduce the terms numerator and denominator at this stage, but it is not necessary yet.

- As you get to less commonly known fractions, for example, $^1/_8$, **ask learners why** the piece is called an eighth and why it is written as one over eight. Stress that the piece is one of eight parts that make up a whole circle. Or **describe it** as one piece of the whole circle which has been divided into eight pieces. Repeat this for all pieces making sure to ask learners why the fraction is named as it is.

- Move on to fractions with numerators other than one. **Demonstrate:** Place two one third pieces together and ask: What is this called? How would you write it? Place the third piece beside these other two pieces to complete the circle and ask: What happens when we put the third piece beside these to complete the circle? What do we have then?

- After this example, **ask learners to try some further examples themselves** where the numerator is not 1. Learners could work individually or in pairs to work out and discuss their answers.

- 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 terms.

Tutor Guidelines for Activity N8: Circles

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

- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Practice Sheet N8

Tutor Guidelines for Activity N9: Snap

Activity **Snap** **N9**

This activity links to **award learning outcomes** **1.1** and **1.3.**

Learning Outcomes

1. Use rational numbers (Q) in basic mathematical functions, drawn from real life situations.
2. Manipulate basic fractions and their equivalence.

Key Learning Points

1. Identifying rational numbers (Q)
2. Identifying and use basic fractions

Materials you will need for this activity

- Fraction SNAP cards
- The circle kit used in N8.
- Practice Sheet N9
- Solution Sheet N9

Prior Learning

- Learners should be familiar with the maths knowledge and skills from N8.
- Learners need to be familiar with the rules of the card game SNAP. If they haven't played already, they could get a friend to teach them or look up the rules.

Tutor Guidelines for Activity N9: Snap

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N9: Snap

Guiding the learners through the Activity

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

- Recap learning from the previous activity.

- This activity introduces the concept of **equivalent fractions** by using SNAP Fraction cards and also the Fraction Circles. In the Getting Started section, **ask learners** if the shaded part of the diagrams of the circles is the same? Can they make any conclusions by looking at these circles?

- In the whole group task, use the circle card $\frac{1}{2}$. Show learners $\frac{1}{2}$ and ask them: **How many ways** can we make a piece of this size using other colours from the fraction circle kit?. Ask them to **name the fractions**. Record the answers on whiteboard or flipchart or projector. Learners will begin to **see a pattern** develop. Refer back to $\frac{1}{2}$ and $\frac{1}{3}$ and ask the learners to predict how many 18th's, 20th's etc. are equivalent to $\frac{1}{2}$ or $\frac{1}{3}$.

- Use large denominators that are not in the kit to try to help learners to develop an understanding of **the rules of multiplication and division** themselves. For example, as well as going forward with $\frac{3}{9} = \frac{1}{3}$, you can encourage them to go backwards with $\frac{1}{3} = \frac{2}{6}$. This will help them see the connections between the fractions.

- Progress to the **Fraction Snap game**. This will help the learners to progress their understanding of equivalent fractions. First, demonstrate how the game works before asking learners to play. The rules of the

Tutor Guidelines for Activity N9: Snap

game are the same as the card game Snap and it can be played in groups or pairs. There is a template in the Resources Pack for you to make your own fraction cards.

- 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 terms.
- Encourage individual learners to keep a **personal dictionary** of new words they want to be able to use, read, write and spell.
- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Practice Sheet N9.

Tutor Guidelines for Activity N10: Wins and losses

Activity Wins and losses N10

This activity links to **award learning outcomes** 1.1 and 1.3.

Learning Outcomes

1. Use rational numbers (Q) in basic mathematical functions, drawn from real life situations.
2. Manipulate basic fractions to include ratios

Key Learning Points

1. Applying mathematical solutions to real life situations
2. Converting simple fractions to ratios

Materials you will need for this activity

- Practice Sheet N10
- Solution Sheet N10

Prior Learning

Ensure that learners are familiar with equivalent fractions from the previous activity, particularly with how to break fractions down to their simplest form.

Tutor Guidelines for Activity N10: Wins and losses

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N10: Wins and losses

Guiding the learners through the Activity

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

- Recap and check learning from the previous activity. Confirm that learners are familiar with equilavnet fractions.

- In the whole group, use discussion and questions to introduce the topic of ratios, for instance: Can you recall any time you encountered ratios in your everyday life? For example odds from a bookmakers are expressed as a ratio. Let's say, odds of "7 to 3 against", written as 7:3, means that there are seven chances that the event will not happen to every three chances that it will happen.

- In the worked example, learners must write a fraction showing how many games Tottenham won in the 2010/11 season, write this fraction in its simpliest form and then convert it to a ratio. You might suggest that learners could try this task using other teams from the Premier League by reaseaching the information on the internet.

- **Explain** the procedures with reference to the worked example. 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 N10: Wins and losses

- Tasks 1 and 2 are simliar to the worked example. Encourage learners to explain to you and to each other how they work out their answers. Encourage them to ask questions.

- 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 terms.

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

- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Finally Practice Sheet N10 will give learners a chance to practise converting simple fractions to ratios.

Tutor Guidelines for Activity N11: How many slices?

Activity How many slices? N11

This activity links to **award learning outcomes** 1.1 and 1.3.

Learning Outcomes

1. Use rational numbers (Q) in basic mathematical functions, drawn from real life situations.
2. Manipulate basic fractions.

Key Learning Points

1. Adding and subtracting fractions
2. Identifying and use basic fractions
3. Solving numerical and verbal problems using basic fractions
4. Applying mathematical solutions to real life situations

Materials you will need for this activity

- Practice Sheet N11
- Solution Sheet N11
- The circle kit used in N8.

Prior Learning

- Learners should be familiar with the maths knowledge and skills from N8 and N9.

Tutor Guidelines for Activity N11: How many slices?

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N11: How many slices?

Guiding the learners through the Activity

- Explain what the learners will be able to do after this activity.
- Ask the learners what they already know from the previous fraction activities.
- Recap with the class before introducing this activity.
- This activity introduces the concept and skills of **addition and subtraction of fractions with the same denominator**.
- Use the fraction circles and the illustrated example of addition and subtraction of fractions to help learners to understand the concept. Explain that we are dealing with fractions of the same denominator.
- Ask learners to use the fraction circles to work through the example. Remind them that $^{8}/_{8}$ means 8 lots of $^{1}/_{8}$ or one full unit.
- After this, ask the learners to try some further examples themselves. Again, encourage them to use the fraction circles. Try to use topics and themes that would be relevant to your particular learners.
- Encourage learners to explain to you and to each other how they work out their answers. Encourage them to ask questions.
- Give opportunities to practise addition and subtraction of fractions using learners' real life situations as context.

Tutor Guidelines for Activity N11: How many slices?

- 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 terms.

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

- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Practice Sheet N11

Tutor Guidelines for Activity N12: Pizza

Activity Pizza N12

This activity links to **award learning outcomes** 1.1 and 1.3.

Learning Outcomes

1. Use rational numbers (Q) in basic mathematical functions, drawn from real life situations.
2. Manipulate basic fractions.

Key Learning Points

1. Adding and subtracting fractions
2. Identifying and using basic fractions
3. Solving numerical and verbal problems using basic fractions
4. Applying mathematical solutions to real life situations

Materials you will need for this activity

- Practice Sheet N12
- Solution Sheet N12
- The circle kit used in N8.

Prior Learning

Learners should be familiar with the previous fraction activities in this pack.

Tutor Guidelines for Activity N12: Pizza

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N12: Pizza

Guiding the learners through the Activity

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

- Before asking them what they need to know, ask them what they already know from the previous activities.

- Recap and discuss with the class before introducing the activity.

- This activity introduces the concept and skills of **addition and subtraction of fractions with different denominators.** This concrete activity develops an understanding of addition and subtraction with different denominators without introducing the term 'common denominator' straight away.

- Ensure that the fraction circles are used to enhance understanding. Highlight that we are dealing with fractions of different denominators.

- The example of $^1/_6$ and $^1/_4$ will help learners realise that 5 twelfths will cover the piece $^1/_6$ and $^1/_4$. When you separate the $^1/_6$ and $^1/_4$ with their coverings of $^1/_{12}$'s, **ask learners what they notice**. You hope they realise that $^1/_4 = {}^3/_{12}$ and $^1/_6 = {}^2/_{12}$. Review equivalent fractions.

- After this example, ask learners to try some further examples themselves. Again, encourage them to use fraction circles.

- The final task in this section, regrading pizza slices, helps learners to practise addition and subtraction of fractions. It requires learners to use their knowledge of equivalent fractions.

Tutor Guidelines for Activity N12: Pizza

- Ask the learners to try some further examples themselves. Again, encourage them to use the fraction circles. Try to use topics and themes that are relevant to your particular learners.

- Encourage learners to explain to you and to each other how they work out their answers. Encourage them to ask questions.

- 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 new mathematical terms.

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

- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Practice sheet N12.

Tutor Guidelines for Activity N13: Recipes

Activity Recipes N13

This activity links to **award learning outcome 1.1.**

Learning Outcomes

1. Use real numbers (R) in basic mathematical functions, drawn from real life situations.

Key Learning Points

1. Identifying real numbers (R)
2. Applying mathematical solutions to real life situations

Materials you will need for this activity

- Practice Sheet N13
- Solution Sheet N13
- A recipe

Prior Learning

Learners should be familiar with natural numbers which are whole numbers, integers which are positive and negative whole numbers and rational numbers which are fractions.

Tutor Guidelines for Activity N13: Recipes

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N13: Recipes

Guiding the learners through the Activity

- Explain what the learners will be able to do after this activity.
- Recap on learning from the previous activity.
- Ensure that learners are familiar with natural numbers, integers and rational numbers form the previous activities. This activity will introduce **the fourth main number system, that is, real numbers**. **Real numbers include all integers, factions and decimals.**
- Use discussion and questions to introduce real numbers, in particular decimals. For example, Can you think of any times you meet decimals in your everyday life? For example, the cost of petrol is €1.52 per litre.
- The first task asks learners to identify and recognise real numbers. They should be clear that real numbers include almost all numbers.
- The second task looks at a recipe for cooking mushroom soup and helps learners to recognise real numbers in a real life situation.
- Ask learners to find any recipe they are interested in and write it out. Ask them to identify and write out all the real numbers in the recipe.
- Encourage learners to explain to you and to each other how they work out their answers. Encourage them to ask questions.
- 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 any new mathematical

Tutor Guidelines for Activity N13: Recipes

terms.

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

- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Practice Sheet N13 allows learners to practise their skills in identifying real numbers.

Tutor Guidelines for Activity N14: Swimming records

Activity Swimming records N14

This activity links to **award learning outcomes** 1.1 and 1.3.

Learning Outcomes

1. Use real numbers (R) in basic mathematical functions, drawn from real life situations.
2. Manipulate decimals.

Key Learning Points

1. Identifying and using decimals
2. Solving numerical and verbal problems using decimals
3. Recognising the value of numbers up to two decimal places
4. Applying mathematical solutions to real life situations

Materials you will need for this activity

- Practice Sheet N14
- Solution Sheet N14

Prior Learning

- Learners should be comfortable with the maths from N13.

Tutor Guidelines for Activity N14: Swimming records

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N14: Swimming records

Guiding the learners through the Activity

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

- Recap learning from the most recent activities.

- Before developing the term **decimal**, ask the learners to talk about the differences between whole numbers and decimal numbers. Perhaps you could show them a price list from a shop or a from a menu and ask learners if they notice any difference between the prices of the items. You could also choose appropriately priced items to ask: Why would you get only whole euros back in change if you buy this item, and a combination of euros with coins less than a euro if you buy that item?

- Before engaging in the activity on Swimming Records, ask learners do they think hundredths of seconds would ever be significant in real life? Is it enough just to use seconds and minutes? Why or why not?

- **Introduce the term decimals and highlight its link to fractions**. Show some real life examples of decimals: for example, a You Tube video showing a Formula 1 grand prix where the difference in times may only be hundredths of seconds. You could also show how the monetary system is based on decimals and how ten cent coins are tenths, cent coins are hundredths and so on.

- It may be a good idea to show learners a video clip of Phelps swimming the 100 metre butterfly either in Athens in 2004 or in Beijing in 2008.

- When discussing the answer to the **sample activity** it is important to

Tutor Guidelines for Activity N14: Swimming records

clearly **break down the time** for the learners. The time is 50.58 seconds: you could describe this as 5 tens, 0 units, 5 tenths and 8 hundredths of a second. You could **connect this to their knowledge of place value** in whole numbers.

- 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 terms.
- Encourage individual learners to keep a **personal dictionary** of new words they want to be able to use, read, write and spell.
- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.
- Practice Sheet N14 will give learners a chance to enhance their knowledge of place value and will allow them to identify units, tenths and hundredths.

Tutor Guidelines for Activity N15: Discover Northern Ireland

Activity Discover Northern Ireland N15

This activity links to **award learning outcomes** **1.1** and **1.3.**

Learning Outcomes

1. Use real numbers (R) in basic mathematical functions, drawn from real life situations.
2. Manipulate decimals.

Key Learning Points

1. Identifying and using decimals
2. Adding decimals
3. Solving numerical and verbal problems using decimals
4. Applying mathematical solutions to real life situations

Materials you will need for this activity

- Practice Sheet N15
- Solution Sheet N15
- Link to AA route planner: http://www2.aaireland.ie/routes_beta/

Prior Learning

- Learners must be comfortable with the maths from N13 and N14.

Tutor Guidelines for Activity N15: Discover Northern Ireland

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N15: Discover Northern Ireland

Guiding the learners through the Activity

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

- Recap learning from the most recent activities.

- When introducing the concept of addition of decimals refer to Activity N14 and the idea of place value. Also highlight the links between the addition of whole numbers and the addition of decimals. For example, explain that we can only add numbers with the same place value no matter what type of number we are dealing with.

- Before starting the tasks, ask learners to work on identifying the distance between their home town, village or townland and nearby locations. Bring a map of the county and a map of Ireland to this session for that purpose.

- These distances can also be found on: http://www2.aaireland.ie/routes_beta/. These distances are mainly given in decimal form. The learners can then write the distances onto the map.

- Show learners that another way to find the distance to a particular destination may be to add two previously worked out distances.

- Ask learners if they have ever been on a trip around Ireland? How many kilometres were they travelling for? How would they be able to calculate the combined length of their journey?

Tutor Guidelines for Activity N15: Discover Northern Ireland

- Help learners to **read** the question carefully, to identify all the pieces of information they are being asked to give. Check that they have understood what the question is asking them to do. Check that they are clear about what information in the question will allow them to do this.

- The Relay Race task will give learners further opportunities to see the real life uses of addition of decimals. Ask each learner to check their own solution by showing them a video clip of the Jamaican team running the 4 x 100 relay at Beijing 2008. The final time recorded on this video clip should be the answer that learners get when they add the four individuals times together.

- Encourage learners to use the calculator to check their own calculations.

- 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 terms.

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

- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Finally Practice Sheet N15 will give learners a chance to enhance their knowledge of adding decimals.

Tutor Guidelines for Activity N16: Ingredients

Activity # Ingredients **N16**

This activity links to **award learning outcomes** **1.1** and **1.3.**

Learning Outcomes

1. Use real numbers (R) in basic mathematical functions, drawn from real life situations.
2. Manipulate decimals.

Key Learning Points

1. Identifying and using decimals
2. Adding and subtracting decimals
3. Solving numerical and verbal problems using decimals
4. Applying mathematical solutions to real life situations

Materials you will need for this activity

- Practice Sheet N16
- Solution Sheet N16

Tutor Guidelines for Activity N16: Ingredients

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N16: Ingredients

Guiding the learners through the Activity

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

- Recap and check learning from previous decimal acctivities.

- Learners should know that subtracting decimals is extremely important for a lot of everyday tasks. Ask learners if they can think of instances where they may need to subtract decimals in their everyday life.

- **Explain** the procedures in 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.

- During the **tasks** it is important for learners to remember how to add decimals, while they move on to also using subtraction. Help them to recognise the difference between when they are required to add decimals and when they must subtract. **It is critical to help learners notice and remember that the word 'difference' means they should subtract**.

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

Tutor Guidelines for Activity N16: Ingredients

learners at that particular time.

- Encourage learners to use the calculator to check their own calculations.
- 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 terms.
- Encourage individual learners to keep a **personal dictionary** of new words they want to be able to use, read, write and spell.
- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.
- Practice sheet N16 will give learners a chance to enhance their knowledge of adding and subtracting decimals. Encourage learners to perform these calculations without using their calculator. Also ask them to check their answer using their calculator.

Tutor Guidelines for Activity N17: January sales

Activity # January sales **N17**

This activity links to **award learning outcomes** **1.3.** and **1.4**

Learning Outcomes

1. Manipulate percentages.
2. Use a calculator.

Key Learning Points

1. Identifying and using percentages
2. Calculating common percentages with and without a calculator
3. Converting percentages to fractions and decimals
4. Solving numerical and verbal problems using percentages

Materials you will need for this activity

- Practice Sheet N17
- Solution Sheet N17

Tutor Guidelines for Activity N17: January sales

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N17: January sales

Guiding the learners through the Activity

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

- Recap on learning from previous session.

- Begin by asking learners: What do you know about the term 'per cent'? Where have you met percentages in your everyday life? Can we represent percentages, for example 50%, in any other form?

- When introducing the idea of percentages it may be worthwhile to bring in newspaper cuttings that refer to percentages. Such headlines appear quite frequently, for example when discussing surveys or statistics or when advertising sales.

- **The most important concept for the learners to understand is that per cent means 'per hundred'** . Therefore it is important that you constantly repeat this idea.

- Learners will have come across goods being sold at sale price, therefore introduce this activity by referring to that situation. You could extend this by getting learners to look up sales items on the internet and seeing how much they would save on particular items they might wish to buy. This could be done as a group activity.

- 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**

Tutor Guidelines for Activity N17: January sales

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.

- Encourage learners to use the calculator to check their own calculations.

- 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 terms.

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

- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Use Practice Sheet N17.

Tutor Guidelines for Activity N18: Maths results

Activity **Maths results** **N18**

This activity links to **award learning outcome 1.3.**

Learning Outcomes

1. Manipulate basic fractions, decimals and percentages.

Key Learning Points

1. Solving numerical and verbal problems using percentages
2. Converting percentages to fractions and decimals and vice versa

Materials you will need for this activity

- Practice Sheet N18
- Solution Sheet N18

Prior Learning

Learners should be comfortable with all the fractions, decimals and percentages activities so far.

Tutor Guidelines for Activity N18: Maths results

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N18: Maths results

Guiding the learners through the Activity

- Introduce this topic by discussing the importance of percentages in the world around us.

- Ask learners to discuss, as a group, the relationship between fractions, decimals and percentages.

- Recap on the meaning of the word per cent.
- Ask the learners if they think it is necessary or important to convert fractions and decimals to percentages and vice versa? And if so why?

- The statistics outlined in Activity N18 refer to 2010. You could ask learners to visit the website www.examinations.ie for current statistics. You could adapt the activity accordingly.

- You could break the results down in other ways: for example, the percentage of males and females who did the exam. The statistics on the website give a range of opporunities for group work and maths project work.

- 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.

- Encourage learners to use the calculator to check their own calculations.

- 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 terms.

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

- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Encourage the learners to complete practice sheet N18 to and to ask you any questions they may have. Encourage learners to do these calculations without using their calculator and then to check their answers using their calculator.

Tutor Guidelines for Activity N19: The weekly shop

Activity # The weekly shop **N19**

This activity links to **award learning outcome 1.3.**

Learning Outcomes

1. Manipulate basic fractions, decimals and percentages.

Key Learning Points

1. Solving numerical and verbal problems using percentages
2. Converting percentages to fractions and decimals and vice versa

Materials you will need for this activity

- Practice Sheet N19
- Solution Sheet N19

Prior Learning

Learners should be comfortable with all the fractions, decimals and percentages activities so far.

Tutor Guidelines for Activity N19: The weekly shop

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N19: The weekly shop

Guiding the learners through the Activity

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

- Recap and check learning from last activity. Recap on the concept of converting fractions and decimals to percentages and vice versa.

- In the worked example learners must convert percentages and fractions to decimals and then multiply by decimals to find the amount of money spent on each food.

- 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.

- Throughout this activity it is important to encourage learners to try to solve the problems without the use of calculators. This will give them practice in converting the percentages and decimals to fractions in order to solve the problems.

- The tasks use the example of the weekly shop. Try to use other topics or situations that would be of interest to your particular learners.

Tutor Guidelines for Activity N19: The weekly shop

- 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 terms.

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

- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Encourage the learners to complete practice sheet N19 to and to ask you any questions they may have. Encourage learners to do these calculations without using their calculator and then to check their answers using their calculator.

Tutor Guidelines for Activity N20: Dividing your winnings

Activity Dividing your winnings N20

(Google Images)

This activity links to **award learning outcomes 1.3**

Introduction

This activity will work further with ratios and mixed fractions in real life contexts.

What will you learn?

Learning Outcomes

You will be able to:

1. Manipulate basic fractions to include ratios.

Key Learning Points

1. Ratios
2. Mixed fractions

Materials you will need for this activity

- Practice Sheet N20
- Solution Sheet N20

Tutor Guidelines for Activity N20: Dividing your winnings

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N20: Dividing your winnings

Guiding the learners through the Activity

- Explain what the learners will be able to do after this activity.
- Before asking them what they need to know, ask learners what they already know from the previous activities. Ensure to recap on the concept of ratios from N10 and what a mixed fraction is from N18.
- Highlight the importance and relevance of ratios in everyday life. Use examples such as recipes, student - teacher ratios, mixing cement, betting. Can the learners think of some examples?
- Up to now, learners will mainly have been dealing with basic fractions. In this activity they will be working with the **three types of fractions – proper, improper and mixed.**
- The first worked example is concerned with dividing money using ratios. The ratio must first be converted to fraction form.
- The second worked example is concerned with simplifying mixed fraction ratios. The mixed fractions must first be converted into improper fractions.
- 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.

- Ask the learners to try the **tasks** themselves.
- 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 terms.
- Encourage individual learners to keep a **personal dictionary** of new words they want to be able to use, read, write and spell.
- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.
- Practice sheet N20 will give learners a chance to enhance their knowledge of ratios and mixed fractions.

Tutor Guidelines for Activity N21: Croke Park

Activity # Croke Park **N21**

This activity links to **award learning outcome 1.5.**

Learning Outcomes

1 Estimate and round off answers to numerical problems to include natural numbers and decimal numbers to 2 decimal places.
2. Use a calculator.
3. Manipulate percentages.

Key Learning Points

1. Rounding off answers
2 Rounding off answers to numerical problems to 2 significant figures including decimal numbers
3 Calculating common percentages with a calculator

Materials you will need for this activity

- Practice Sheet N21
- Solution Sheet N21

Prior Learning

Learners should be able to understand place value and how to calculate percentages.

Tutor Guidelines for Activity N21: Croke Park

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N21: Croke Park

Guiding the learners through the Activity

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

- Recap and check learning from last activity.

- In the whole group, use questions and discussion to introduce this topic, for example: Can you think of any time you met large natural numbers in your everyday life? Were these numbers easy to handle? Would it be easy to perform operations such as multiplication on these numbers? Can you think of any way that you may be able to make these numbers easier to work with?

- Following on from this discussion you could show learners a recent Lotto advertisement showing a large prize fund. If the jackpot was €16,987,654 the advertisement would say that the Lotto was close to 17 million. Ask learners to discuss why the advertisement is saying that the fund is closer to 17 million than 16 million. This will **introduce the concept of rounding off** numbers in real life.

- Introduce the concept of **rounding off decimal numbers**. Show how this is very similiar to rounding off whole numbers.

- 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.

Tutor Guidelines for Activity N21: Croke Park

- 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.

- 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 terms.

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

- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Finally Practice Sheet N21 will give learners a chance to practise rounding off more figures to either tens, hundreds or thousands.

Tutor Guidelines for Activity N22: Bus schedules

Activity Bus schedules N22

This activity links to **award learning outcome 1.2.**

Learning Outcomes

1. Demonstrate an understanding of units of time.
2. Manipulate basic fractions.

Key Learning Points

1. Understanding and using units of time in real life
2. Representing data pictorially to solve problems
3. Using basic factions

Materials you will need for this activity

- Bus timetables.
  - Download from www.dublinbus.ie or www.buseireann.ie
- Practice Sheet N22
- Solution Sheet N22

Tutor Guidelines for Activity N22: Bus schedules

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N22: Bus schedules

Guiding the learners through the Activity

- Ask the learners about everyday situations where it may be important to be able to read the time. What may happen if you do not understand how to work with units of time? Can you think of a scenario where your plans were affected because you miscalculated time or misread the time?

- When introducing the idea of **base** sixty, rather than simply telling learners what the term 'base sixty' means, ask them for their own opinions first. Learners' prior knowledge may allow them to guess that base sixty is used in time, since there are 60 minutes in an hour, sixty seconds in a minute.

- You might wish to share some background historical information with the learners in relation to base sixty. Time is one aspect of daily life that appears to have maintained the number system first designed around 3100 BC. Historians believe that the Babylonian number system was one of the first number systems with a base of sixty. However it was very complex and subsequent number systems were of base 10, just as our number systems are today.

- If possible, when introducing the two different ways of reading the time, you could bring in two different types of clocks, that is, one 24 – hour clock and one 12 hour clock. Although the picture in the Learner Pack should help, seeing the actual clocks may be more effective, and may allow learners to draw on their previous knowledge or recognition.

- Explain the procedures with reference to the examples. Use focused

Tutor Guidelines for Activity N22: Bus schedules

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.

- **Task 1** focuses on learners converting time on the 24 hour clock to time on the 12 hour clock. For further practice, you could give each pair of learners a page from the RTE Guide and between them they could rewrite the television schedule using the 12 hour clock.

- In order to ensure that **Task 2** is as applicable to learners everyday life as possible, it is important that you extend or alter this task somewhat to get learners answering questions in relation to local bus or train routes. Timetables for most routes can be accessed on any of the following sites; Iarnrod Eireann; Bus Eireann; Dublin Bus. You may not necessarily have to give learners questions but rather allow them to think of scenarios when they may use public transport and get them to decide what bus they would need to get, how long it would take to get to their destination and what time they would arrive at their destination.

- Facilitate the group to build a group **glossary** of mathematical terms.

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

- Make, or encourage learners to make, a **wordwall** of key terms used in

Tutor Guidelines for Activity N22: Bus schedules

the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Use Practice Sheet N22.

Tutor Guidelines for Activity N23: Winter sales

Activity Winter sales N23

This activity links to **award learning outcomes** 1.2, 1.3, 1.4, and 1.5

Learning Outcomes

1. Demonstrate an understanding of money and shopping.
2. Manipulate basic fractions and percentages.
3. Use a calculator to perform common mathematical functions including the % key.
4. Estimate and round off answers to numerical problems to include natural numbers and decimal numbers to 2 decimal places.

Key Learning Points

1. Recognising number bases used in shopping
2. Calculating common percentages with and without a calculator
3. Recognising values of numbers up to 2 decimal places
4. Solving numerical and verbal problems using basic fractions and percentages
5. Calculating percentages
6. Estimating total of selection of items in context of shopping

Materials you will need for this activity

- Local shopping brochures
- Access to the internet
- Practice Sheet N23
- Solution Sheet N23

Prior Learning

In the previous activity we looked at number bases through the study of time.

Tutor Guidelines for Activity N23: Winter sales

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N23: Winter sales

Guiding the learners through the Activity

- **Recap on the concept of number bases**. Allow learners to recap on what is meant by a number system having a **base of 60.** Then **ask learners** what they believe it means for a number base to have a **base of 100.**

- **Revisit the idea of percentages and fractions** before starting this activity. You also need to ensure that learners can recall how to find a fraction or a percentage of a number. Ensure that learners have a good understanding of adding numbers with two decimal places.

- You could bring in flyers or brochures from local shops which are advertising reductions in their stores. This will enhance learning and show learners the value of mathematics in the real world. A good example may be leaflets that supermarkets often deliver to houses, advertising 20% or 50% reductions.

- When you are introducing the idea of **estimation and rounding off**, you should **ask learners** how they know how much money to bring when doing a weekly shop. You could also ask how quickly they figure out whether or not they will have enough money for everything they wish to buy. Learners will probably then realise that they have often used estimation before even though it was in an informal manner.

Tutor Guidelines for Activity N23: Winter sales

- Ask learners in what other contexts might it be important or useful to estimate or round off? Here are some examples: when getting the total attendance at a football game or when giving a rough idea of the time it will take you to do something, such as go to the cinema and get home by such and such a time.

- 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.

- If **Task 2** is not appropriate for all learners, that is, if some learners would not usually do the weekly shopping, you could do the same activity using a weekly shopping list you have pre-designed. This should be a fairly long list with many different items it. There should be some items that are reduced or on special offer. Then give each learner a list of 10 items from that longer list. Ask the learner to find and select only the ten items on their own list.

- 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 new mathematical terms.

Tutor Guidelines for Activity N23: Winter sales

- Encourage individual learners to keep a **personal dictionary** of new words they want to be able to use, read, write and spell.
- Make, or encourage learners to make, a **wordwall** of key terms used in the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.
- Encourage learners to complete the Practice Sheet N23.

Tutor Guidelines for Activity N24: Furnishing a room

Activity Furnishing a room N24

This activity links to **award learning outcomes** 1.2, 1.3

Learning Outcomes

1. Demonstrate an understanding of units of measurement.
2. Manipulate basic fractions.
3. Manipulate basic decimals.

Key Learning Points

1. Becoming familiar with number bases in real life including units of measurement
2. Solving problems involving a selection of number bases
3. Solving numerical and verbal problems using basic fractions
4. Solving numerical and verbal problems using basic decimals
5. Recognising values of numbers up to 2 decimal places

Materials you will need for this activity

- Measuring tape
- Practice Sheet N24
- Solution Sheet N24

Tutor Guidelines for Activity N24: Furnishing a room

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. Plan discussion, quizzes, games, worksheets and/or other activities to help learners develop understanding of the maths language and concepts. 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.

- Plan to involve learners in **focused discussion** as much as possible during the session. Build in activities that **help learners speak** about

  - **what they already know** about the topic and about the mathematics involved;
  - their **experience** of the topic and of the real world maths involved
  - their **opinions and suggestions** related to the activity, topic and the maths involved;
  - their suggestions for **other ways of learning** the mathematics

- 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.

Tutor Guidelines for Activity N24: Furnishing a room

Guiding the learners through the Activity

- Before introducing formal definitions or terminology on measurement, ask learners where they may have seen symbols or abbreviations such as ml, L, cm or M. Learners will be familiar with these abbreviations from everyday products such as bottles of soft drink or rulers. These questions should lead learners to associating millilitres and litres with liquids and centimetres and metres with length or measurement.

- The topic of **equations** is more fully explored in Unit 2, but it is important that you briefly introduce the concept here to help with **conversion.** Ideally, bring in a weighing scales that is balanced initially using blocks. Then when you remove a block from one side of the scales, ask learners to record and explain what happens. You should also ask learners to consider how they could get the scales balanced again. This will lead to the idea that i**f two sides of an equation are balanced or equal, then if you do something to one side, to maintain the balance, you must do the same to the other side**.

  If you do not have access to scales or do not feel that this concrete approach would suit the needs of your class, then you can find an interactive scales which highlight the concept of an equation at: http://www.learnalberta.ca/content/mesg/html/math6web/index.html?page=lessons&lesson=m6lessonshell11.swf. This will help learners fully understand the conversion process.
- Explain the procedures with reference to the examples. Use focused questioning and other methods to check understanding at each stage.

Tutor Guidelines for Activity N24: Furnishing a room

- **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.

- Once learners understand how to convert, you could again show a concrete example to the class. First ask learners to convert ½ a litre or 0.5 of a litre to millilitres. Learners should get an answer of 500 ml. Ask a learner to fill a marked beaker with half a litre of water and then ask them to transfer the water from the beaker into a 500 ml bottle, for example, a small Fanta bottle. Learners will then be able to physically see how ½ litre is the exact same as 500 ml.

- In the final task, encourage learners to work in groups rather than in isolation. Assign a role to every member of the group for measuring the different objects. For example, one group member is a recorder, another is a measurer and a third is a reader.

- 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 terms.

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

- Make, or encourage learners to make, a **wordwall** of key terms used in

Tutor Guidelines for Activity N24: Furnishing a room

the Activity. Give plenty of opportunities for learners to focus on and use those terms in discussion and in writing. Change the words displayed at intervals during the course, as learners become familiar with them and as you introduce new topics.

- Encourage learners to complete Practice Sheet N24.

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