

Mathematical Literacy, Mathematics and Mathematical Sciences

Illustrative Learning Programme

Grade 7

**Module 2:
SPORT**



TEACHER'S GUIDE

Phase Organisers: Culture and Society

Programme Organiser: Sport

Specific Outcomes and Assessment Criteria from the MLMMS Learning Area:

- SO1: Demonstrate an understanding about ways of working with numbers
AC1: Evidence of some knowledge of rational and irrational numbers, including the properties of rational numbers
AC4: Performance of operations accurately
AC6: Solving of real life and simulated problems
AC7: Demonstration of skills of investigative approaches within mathematics
- SO2: Manipulate numbers and number patterns in different ways
AC1: Identification and use of numbers for various purposes
AC2: Evidence that number patterns and geometric patterns are recognised and identified using a variety of media
- SO3: Demonstrate an understanding of the historical development of mathematics in various social and cultural contexts
AC1: Understanding of mathematics as a human activity
- SO4: Critically analyse how mathematical relationships are used in social, political and economic relations
AC5: A critical understanding of mathematics use in the media
- SO5: Measure with competence and confidence in a variety of contexts
AC1: Evidence of an understanding of error
AC2: Evidence of knowledge of working with concepts and units of measurement
AC3: Evidence of knowledge of working with time
AC5: Evidence of knowledge of relationships between various units used commonly in science
- SO6: Use data from various contexts to make informed judgements
AC1: Identifications of situations for investigation
AC2: Collection of data
AC3: Organisation of data
AC6: Communication of findings
- SO9: Use mathematical language to communicate mathematical ideas, concepts, and generalisations and thought processes
AC1: Use of language to express mathematical observations
AC2: Use of mathematical notation
AC3: Use of mathematical conventions and terminology
AC6: Representation of real life and simulated situations
- SO10: Use various logical processes to formulate tests and justify conjectures
AC1: Evidence of logical reasoning in the solution of problems.

Specific Outcomes from other Learning Areas:

Language, Literacy and Communication:

SO1: Make and negotiate meaning and understanding

AC 1: Original meaning is created through personal texts

AC 4: Meaning is constructed through interaction with other language users

AC 8: Reasoned arguments about interpretation and meaning are developed.

SO6: Use language for learning

AC 1: Different styles and terminology suited to the demands of a particular learning area are used.

AC 2: Learning strategies are evaluated and adapted according to the demands of the task.

AC 3: Language is used in order to refine ideas and solve problems

AC 4: Language to talk about learning is used

Life Orientation:

SO7: Demonstrate the values and attitudes necessary for a healthy and balanced lifestyle

AC 1: Various lifestyles in terms of a healthy and balanced approach are appraised

AC 3: Goal setting for a healthy and balanced lifestyle is demonstrated

Natural Sciences

SO5: Use scientific knowledge and skills to support responsible decisions

AC 1: Issues are identified

AC 2: Scientific information relevant to the issues is gathered

AC 3: Information is prepared for the decision making process

AC 4: Reasons for decisions are communicated

Technology

SO6: Demonstrate an understanding of the impact of technology

AC 1: Technological impact in a variety of contexts is reviewed

Strands:

This module contains material from the Number, Measurement, Shape and Space, and Data Strands

Levels:

The ideal Grade 7 learner should be doing maths at Level 4 or 5 on the Progress Maps.

Because of the nature of the subject, it is quite possible, in one classroom, to have learners Who are at level 1 in maths and others who are at levels 5 or 6.

Duration:

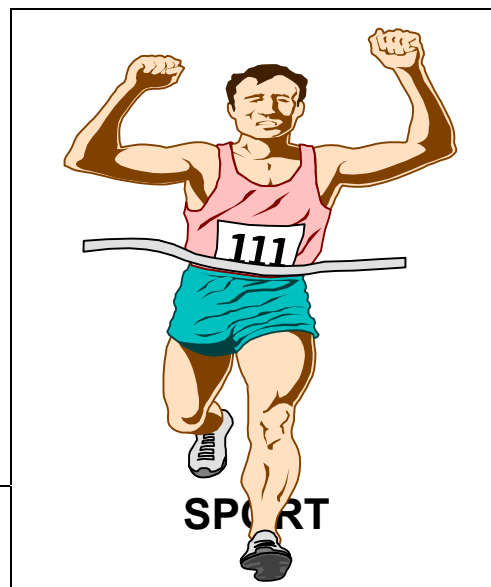
About 3 to 4 weeks, with 5 hours per week.

Knowledge

- of athletics in South Africa and the world
- of the history of the Olympics
- of track events in athletics
- of how the athletics track is laid out
- of different world records
- of recording of time
- of diet

Skills

- writing and recording decimals
- ordering decimals
- adding, subtracting, multiplying and dividing decimals
- comparing decimals
- rounding off
- measuring
- using calculators
- problem solving
- analysing data
- reading time lines



Values and Attitudes

- an appreciation of sport
- an understanding of how gender can affect performances in sport
- an understanding of ethics (i.e. no cheating; no steroids or banned drugs; the importance of adhering to the rules)
- an awareness of the inequalities in resource allocation and in development
- an understanding of sport as a nation builder
- the importance of team spirit

Overview of the module

Introduction:

This module uses the theme of sport to work with measurement of length, conversions between different units of length, and doing calculations with length and the Hindu-Arabic Numeration system.

It then introduces Linda and Makhaya who are friends attending the same primary school in Cullinan near Pretoria. Linda is the school's champion girl sprinter, and Makhaya is the champion boy long distance runner.

The two of them investigate records set at the Olympics, by both men and women; they look at whether women can run as fast as men; they look at diet, at promoting team spirit, at relay races, and at long distance races

The reason for choosing the programme organiser:

One of the reasons we had for selecting Sport was that all learners, whether urban or rural, would have some prior knowledge of sport on which we could build.

We felt that working with decimals would fit very easily under the theme Sport

Hints for assessment:

We suggest that teachers reads the description of each level listed in the progress maps in order to find the appropriate level of knowledge, skills, values and attitudes you should be directing all your learners towards, according to both their individual and group competencies. Not all learners will be on the same level and the material is rich enough to allow all learners some opportunity for achieving success.

Structure of the module:

This module starts off by looking at some of the facts that learners need to know about athletics in order to continue with the module. They look at how long a metre is, the lengths of the standard athletics races, how to convert from metres to kilometres, and how to read time off a stopwatch.

It then introduces Linda and Makhaya, both of whom are talented athletes. Learners find out about famous athletes like Marion Jones, Florence Griffith-Joyner, Carl Lewis, and Ben Johnson, and do various calculations using athletes times.

The learners then look at the fat content of various food stuffs, and then look at team spirit.

- To support the activities in this module, it will be helpful to collect newspaper reports, articles in magazines and information from TV reports on local and international sportsmen and women. Find about their current and their record times for events in track athletics. This information could be displayed in the classroom for the learners to read in their spare moments.
- Try to find out about current important athletic events, both in South Africa and overseas and ask the learners to collect information about them. This will encourage the learners to read the newspaper, a good educational resource.

Note to the teacher: Ideally, this module should co-incide with the athletics season at your school so the athletics track is marked out at the time.

UNIT 1: INTRODUCING LINDA AND MAKHAYA

DURATION OF THE UNIT: This unit should take 1 hour to complete

CLASSROOM ORGANISATION: The learners should work on this with their partner.

WHAT ARE THE OUTCOMES FOR THIS UNIT?

The learners should be able to:

- read information about Linda and Makhaya, the two young athletes whose running career we follow through the module
- write down at least 5 facts about each of them
- write down the names of famous South African athletes

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- Learners are asked to read some information about Linda and Makhaya, and then to discuss with their partner what they have read. Linda is a short distance runner and Makhaya runs long distances.
- After reading the short block of text, learners are asked to write down some of the things they have learnt from their reading.
- They are also asked to write down the names of famous South African athletes.

ANSWERS

- There could be two interpretations to what is being asked in Question 3:
One meaning of the word “athlete” is someone who either takes part in track events, or in field events. Another interpretation of the word “athlete” is anyone who takes part in any sport - and this could include soccer players; cricket players; swimmers; etc.

HOW WILL THE LEARNER’S ACHIEVEMENT BE ASSESSED?

- Learners can be informally assessed by their ability to list 5 facts about each of the young athletes. The facts that they list will give you an idea of how good each pair of learners’ reading ability is.
- Their general knowledge can also be informally assessed by their ability to list names of famous South African athletes.
- They can also page through the rest of the activities in the module to find names of some famous athletes.

UNIT 2: LET'S FIND OUT ABOUT ATHLETICS

In this Unit, the learners are introduced to some of the technicalities of athletics.

DURATION OF THE UNIT : This unit should take 6 hours to complete - about one hour for each activity.

RESOURCES NEEDED:

- In Activity 2.1, each learner will need a piece of string slightly more than 1 metre long. You will also need a few tape measures or metre rulers.
- Activity 2.4 would make more sense to the learners if they had a real analogue and a digital stop watch to compare the two. However, if you don't have access to either of them, the diagrams should give the learners an idea of what they look like and how they work.
- In Activity 2.5, the learners will need space to measure out a race track that is 100m long. They will also need a stop watch to time the runners.
- In Activity 2.7, if you can get hold of a regular size baton, it would give the learners a chance to look at it and see whether it meets the required standards.

CLASSROOM ORGANISATION:

- In Activities 2.1, 2.2, 2.4 and 2.7, the learners should work with their partners
- In Activity 2.3, they should work on their own
- In Activity 2.6, they should work with their group
- In Activity 2.5, the whole class should work together, outside the classroom.

Activity 2.1: *HOW LONG IS A METRE?*

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to

- estimate how long a metre is
- mark off a metre on a piece of string
- use the metre long piece of string to measure the distance from the tip of their middle finger to their nose.

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- For this Activity, they should work with a partner.
- Many learners do not have a good sense of how long a metre is.
- By estimating how long it is, and then measuring, they will get a better sense of how long a metre is, and apply this knowledge to visualise the longer distances dealt with in the unit

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED?

- By measuring their estimates, the learners will be able to assess them themselves.
- They can compare the markings on their piece of string with the markings on other learners' pieces of string, and in that way, will also be able to assess their work themselves.
- By working with a partner, they will be able to assess one another when it comes to finding out how they can use their bodies to measure one metre.

Activity 2.2 HOW FAR DO ATHLETES RUN?

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to

- find out where the different races start on the athletics track
- find out what fraction, common and decimal, one race is of another

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- For this Activity, the learners should work with a partner. If they don't finish the questions in class, they can finish them on their own at home.
- This activity introduces learners to a regulation-sized athletics track and the distances of the most common track events.
- Learners will trace the picture of the athletics track into their books. (The page of an exercise book is generally thin enough for them to use to trace the athletics track.)
- The learners will be practising simplifying fractions, and converting common fractions to decimal fractions.

ANSWERS TO ACTIVITY 2.2

1. *Trace the picture of the athletics track on page 6 into your exercise book*
2. *The athletes all end their races at the finishing line which is marked on the diagram of the athletics track. Make a mark on your track to show where you think the 200m race starts.*

Note to the teacher: As the finishing line is in a fixed position, we measure the total distance from finishing line to start line

3.
 - a) *Make another mark on your track to show where you think the 1 500m race starts.*
 - b) *How many times would you have to run around the track when you compete in the 1 500m race?*

One way of working out the answer is: $\frac{1\,500m}{400m} = \frac{15}{4} = 3\frac{3}{4} = 3,75$

Another way of working out the answer is:

$$\underline{3} \times 400m = 1\,200m$$

$$1\,200m + \underline{300m} = 1\,500m \text{ and } \frac{300m}{400m} = \frac{3}{4}$$

So, you would have to run $3\frac{3}{4}$ times around the track.

- 4 a) *Make a mark on the track to show where the 5 000m race starts.*
 b) *How many times would you have to run around the track when you compete in the 5 000m race?*

One way of working out the answer is:

$$\frac{5\,000m}{400m} = \frac{50}{4} = 12\frac{2}{4} = 12\frac{1}{2} = 12,5$$

Another way of working out the answer is:

$$\underline{12} \times 400m = 4\,800m$$

$$4\,800m + \underline{200m} = 5\,000m \text{ and } \frac{200m}{400m} = \frac{2}{4} = \frac{1}{2}$$

So, you would have to run 12½ times around the track.

- 5 a) *Make a mark on your track to show where the 10 000m race starts.*
 b) *How many times would you have to run around the track when you compete in the 10 000m race?*

$$\frac{10\,000m}{400m} = \frac{100}{4} = 25$$

So, you would have to run 25 times around the track.

6. *Now write these distances firstly as common fractions of the whole track, and then as decimal fractions of the whole track. (Remember that the track is 400m long)*

a) $\frac{200m}{400m} = \frac{2}{4} = \frac{1}{2}$ and $\frac{1}{2} = 0,5$ as 2|1,00
 0,50

b) $\frac{50m}{400m} = \frac{5}{40} = \frac{1}{8}$ and $\frac{1}{8} = 0,125$ as 8|1,000
 0,125

- 7 *What fraction is the first distance of the second distance?*

a) $\frac{100m}{200m} = \frac{1}{2}$

b) $\frac{200m}{400m} = \frac{2}{4} = \frac{1}{2}$

c) $\frac{100m}{800m} = \frac{1}{8}$

d) $\frac{200m}{800m} = \frac{2}{8} = \frac{1}{4}$

$$e) \quad \frac{5\,000m}{1\,500m} = \frac{50}{15} = \frac{10}{3} = 3\frac{1}{3}$$

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED?

The learners should be working together in pairs, and as a result, should be able to help each other obtain the correct answer. We suggest that the partners compare their answers to another pair's work, and where their answers differ, they discuss and work out the answers together.

Activity 2.3 KILOMETRES AND METRES

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to

- convert distances from metres to kilometres
- find out how much longer one race is than another.

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- For this Activity, the learners should work on their own.
- In this Activity, the learners practise converting from metres to kilometres.
- They also practise subtracting decimals by comparing distances.

ANSWERS TO ACTIVITY 2.3

1. *In your groups discuss how far you would have to walk to go one kilometre.*
Encourage the learners to discuss this. They need to build up a feeling for how long a kilometre is.
2.
 - a) *Which of the track races listed in Activity 2.2 are more than a kilometre long?*
 - b) *Write each of the race distances listed in Activity 2.2 in kilometres.*
 - c) *The Standard Marathon is 42,2 km long. How much longer is the marathon than the 10 000m race?*

RACES	QUESTION 2a	QUESTION 2b
100m		0,1km (or 0,100 km)
200m		0,2 km (or 0,200 km)
400m		0,4 km or (0,400 km)
800m		0,8 km/ 0,800 km
1 500m	more than 1 km	1,5 km/1,500 km
3 000m	more than 1 km	3 km/3,000 km
5 000m	more than 1 km	5 km/5,000 km
10 000m	more than 1 km	10 km/10,000 km
4 x 100m = 400m		0,4 km/0,400 km
4 x 400m = 1 600m	more than 1 km	1,6 km/1,600 km
100m hurdles		0,1 km/0,100 km
200m hurdles		0,2 km/0,200 km
42,2km	more than 1 km	42,2 km

- c) $10\,000\text{m} = 10\text{ km}$
 $42,2\text{ km} - 10\text{ km} = 32,2\text{ km}$
 The Standard Marathon is 32,2 km longer than the 10 000m race.

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED?

The learners should be all be able to answer all the questions in the Activity. We suggest that the learners compare their answers to one other person's answers. Where their answers differ, we suggest that they redo the examples, and see if they can reach consensus.

Activity 2.4 MEASURING TIME

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to

- select the correct units of time to use when measuring the time taken to run races of different lengths
- read time off a non-digital (analogue) stop watch
- read time off a digital stop watch
- draw number lines on which to plot different times
- write various times in order from fastest to slowest (i.e. in ascending order).

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- For this Activity, the learners should work with a partner.
- This set of activities deals with how times are recorded, and deals specifically with shorter distances which are recorded in seconds and fractions of a second.
- Learners are shown how a stop watch records time in seconds and two-tenths of a second. They are encouraged to see this is a limitation, as fractions of times that fall between $1/10$ and $2/10$ of a second are difficult to determine accurately.
- The electronic timing device and the digital stop watch are shown to be more accurate instruments for measuring times on the track.

Hint for the teacher: Often the learners struggle to know which numbers to fill in between the two given numbers. It usually helps if you encourage your learners to add another decimal place on to the first and last digit. E.g. $0,1 = 0,10$ and $0,2 = 0,20$; $10,1 = 10,10$ and $10,2 = 10,20$

ANSWERS TO ACTIVITY 2.4 (jackie sort out these please!)

1. $\text{---+---+---+---+---+---+---+---+---+---+---}$
 $0 \quad 0,1 \quad 0,2 \quad 0,3 \quad 0,4 \quad 0,5 \quad 0,6 \quad 0,7 \quad 0,8 \quad 0,9 \quad 1$
2. $\text{---+---+---+---+---+---+---+---+---+---+---}$
 $0,10 \quad 0,11 \quad 0,12 \quad 0,13 \quad 0,14 \quad 0,15 \quad 0,16 \quad 0,17 \quad 0,18 \quad 0,19 \quad 0,20$
3. $\text{---+---+---+---+---+---+---+---+---+---+---}$
 $10,10 \quad 10,11 \quad 10,12 \quad 10,13 \quad 10,14 \quad 10,15 \quad 10,16 \quad 10,17 \quad 10,18 \quad 10,19 \quad 10,20$
4. $\text{---+---+---+---+---+---+---+---+---+---+---}$
 $21,30 \quad 21,31 \quad 21,32 \quad 21,33 \quad 21,34 \quad 21,35 \quad 21,36 \quad 21,37 \quad 21,38 \quad 21,39 \quad 21,40$
5. $13,79; 13,98; 14,09; 14,23; 14,53; 14,67;$

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED?

Learners need to be able to plot decimals on a number line. This is linked to Specific Outcome 1: Demonstrate understanding about ways of working with numbers. Level 4 on the Progress Maps states that learners should be able to read, write, compare and order decimal numbers to ten thousandths (and beyond) in context and abstractly.

Thus learners in Grade 7 should be able to cope with activities like this one. If they are struggling, we suggest that you give them similar exercises to do from a textbook.

Activity 2.5 *RUNNING ONE HUNDRED METRES*

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to

- time members of the class as they run a 100m race
- compare their times

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- We suggest that the whole class work on this Activity together.
- There are three parts to this Activity (i) measure out s track that is 100m long (ii) timing 5 boys and 5 girls as they run a 100m race (iii) comparing various times (i.e. subtracting decimals)
- It is not easy measuring 100m using pieces of string, but it is suggested that you give this to the class to do as a problem solving activity.
- When it comes to selecting the 5 boys and 5 girls to do the running, do the selection at random. In other words, it is not necessary to choose the fastest boys and girls to do the running.
- If you don't have a stop watch, try to borrow a digital watch with a stop watch. If that is also not possible, borrow an ordinary digital watch and start time when the seconds are on zero. Then, instead of everyone running at once, it might be easier to time if you time one learner at a time.
- Once the races have been run, and the times have been recorded, the learners could break up into their groups to order the times, and also to find the differences in the times.

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED

Level 4 in the Progress Maps state that learners should develop and describe strategies for adding, subtracting, multiplying and dividing simple decimals, abstractly and in context. Hence this exercise revises what the learners should already know.

Learners should compare their answers to others in the class. Where their answers differ, they should redo the calculation and try to reach agreement.

Activity 2.6 *WHAT IS TEAM SPIRIT?*

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to:

- think about what is meant by "team spirit"
- discuss the importance of team spirit in sport.

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

Another phrase that is sometimes used instead of the words Team Spirit is “esprit de corps” (pronounced es pre de kor) which is a French phrase meaning the same thing as Team Spirit i.e. a sense of union and of common interests and responsibilities to the group. It also describes the comradeship that exists between people who are involved in something like athletics, or other sports.

Learners can discuss the value of school spirit and how this helps give the team confidence and a will to win

The picture shows the Team Spirit that exists between two members of the South African team that competed in the World Youth Games in 1998.

Encourage the learners to describe in their own words what they feel is meant by Team Spirit. Also encourage them to think of their own examples of Team Spirit that they have seen.

HOW WILL THE LEARNER’S ACHIEVEMENT BE ASSESSED?

Teachers can informally assess their learners contribution to the discussion. Try to encourage all the learners to contribute.

Activity 2.7 RELAY RACES

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to:

- Understand how a relay race works.
- Calculate the number of batons produced from given lengths of tubing.
- Be able to mark out a circle with a given circumference using a piece of string and measure its diameter with a ruler.

WHAT CAN BE DONE TO ACHIEVE THIS LEARNING?

As an introduction to this Activity, the learners could get into teams and run some relay races. Once they have run the races, they can discuss the difficulties of passing on the baton, and the importance of everyone’s contribution to the running of the race.

ANSWERS TO 2.7

1. *Mr Williams has a friend who makes batons for the schools’ athletics teams
He cuts the batons from a piece of tubing that is 60cm long.*

a) *How many batons can he make from this length?*

A baton should be 28,3 cm long

$2 \times 28,3 \text{ cm} = 56,6 \text{ cm}$

So, he can make 2 batons from 60 cm.

b) *How much tubing is left over?*

$60 \text{ cm} - 56,6 \text{ cm} = 3,4 \text{ cm}$

So, 3,4 cm is left over.

2. *How many batons could he make from tubing that is 6 m long?*
6 m = 600cm

One method that you can use is:

We can cut 20 batons from 6m because

$$20 \times 28,3\text{cm} = 566\text{cm}; 600\text{cm} - 566\text{cm} = 34\text{cm}$$

We can cut 1 more baton from the 34cm, leaving 5,7cm

This means that we can cut 21 batons from 6m, with 5,7cm left over.

A second method that you can use is:

$$600\text{cm} \div 28,3\text{cm} = 21,201413$$

This means that we can cut 21 batons from 600 cm

3. *Work out how many batons can be made from tubing that is:*
a) 346 cm b) 905,6cm c) 2,00m d) 5,66m

Either method one or method can be used to find these answers.

- a) Method 1:

We can cut 10 batons from 346cm because

$$10 \times 28,3\text{cm} = 283\text{cm}$$

$$346\text{cm} - 283\text{cm} = 63\text{cm}$$

We can cut 2 batons from 63cm because

$$2 \times 28,3\text{cm} = 56,6\text{cm}$$

$$63\text{cm} - 56,6\text{cm} = 3,4\text{cm}$$

So we can cut 12 batons from 346cm.

Method 2:

$$345\text{cm} \div 28,3\text{cm} = 12,190812$$

So 12 batons can be made from this piece of tubing

- b) Using method 2, we find that : $905,6\text{cm} \div 28,3\text{cm} = 32$
So 32 batons can be made from this piece of tubing

- c) Using method 2, we find that :
 $2,00\text{m} \div 28,3 \text{ cm} = 200\text{cm} \div 28,3\text{cm} = 7,0671378$
So 7 batons can be made from this piece of tubing

- d) Using method 2, we find that : $5,66\text{m} \div 28,3\text{cm} = 566\text{cm} \div 28,3\text{cm} = 20$
So 20 batons can be made from this piece of tubing

4. *We are told that the circumference of the baton is 12cm.*

- a) *Write down what we mean when we talk about the circumference of a baton.*
The circumference of a baton is the distance all the way around the baton. It is the perimeter of the round part of the baton.

- b) *Cut a piece of string 12cm long, and use it to help you draw a circle with a circumference of 12cm.*
As a piece of string is quite flimsy, it is not easy getting it into a circular shape. Encourage the learners to get their shape as round as possible. They can then trace lightly around the string to get their circle
- c) *Measure its diameter (the longest distance across a circle)*
The diameter should be approximately 3,8cm long.

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED?

The learners responses to these questions will give you an idea of whether they have understood the concept. In this Activity, depending on the method that they choose to use, they are either practising dividing decimals, or are using "trial and error" along with multiplication and subtraction. If you feel that the learners need more practise, we suggest that you take more examples out of the textbook you are currently using.

2. *How many years are there between the first Olympic Games in Ancient Greece, and the first Olympic Games in Modern Times?*
 From 1370 BC to the year 0 is 1 370 years
 From the year 0 to 1896 is 1 896 years
 $1\ 370 + 1\ 896 = 3\ 266$
 So there were 3 266 years between the two games.

3. *How many years are there between the first Modern Olympic games and the 1928 Games where women were first allowed to compete in all events.*
 $1928 - 1896 = 32$ years. In other words, women were allowed to compete 32 years after the beginning of the Olympic Games.

4. *When and where will the next Olympic Games be held?*
 The Summer Olympic Games will be held in Sydney in the year 2000, and in Athens in the year 2004. The Winter Olympic Games will be held in Salt Lake City in the year 2002.

5. *How many years are there between the year that the first games were held in Ancient Times and the next Olympic Games?*
 The first Olympic Games were held in the year 1370 BC.
 When this was written, the next Olympic Games were due to be held in the year 2000.
 $1370 + 2000 = 3\ 370$
 So there are 3 370 years between the first Games held in Ancient Times, and the next Olympic Games

6. *For how many years have women been allowed to compete fully in the Games?*
 The answer will differ here according to the year in which it is answered.
 Women were allowed to compete in 1928.
 Suppose you are answering this in the year 2000:
 $2000 - 1928 = 72$ years
 So women have been allowed to compete for the last 72 years.

7. *How long ago was South Africa barred from the Games?*
 Suppose you are answering this in the year 2000.
 $2000 - 1964 = 36$ years
 So South Africa was barred from the Games 36 years ago.

8. *How many years has it been since South Africa was readmitted to the Games?*
 Suppose you are answering this in the year 2000.
 $2000 - 1992 = 8$ years
 So South Africa was readmitted to the Games 8 years ago.

Activity 3.2 WOMEN'S 100 METRES OLYMPIC RECORDS

Learners examine Olympic women times for the 100 metres.
 They have to arrange them in two ways: first in order of date and then order of times.
 They compare times over a 2x 4 year periods.
 They observe whether new records are set at every Games,
 They determine the fraction of American runners in the table
 They must give the four dates planned for the Games.
 They then decide in which century these Games will be held.

ANSWERS TO ACTIVITY 3.2

1. Linda has a list of some of the winners of the Women's 100m race at the Olympic Games from the years 1928 - 1996. Unfortunately, they are not in date order. Arrange the names of the winners in order from 1928 to 1996.

Year	Name	Country	Times In Seconds
1928	E Robinson	USA	12,2
1932	S Walasiewicz	Poland	11,9
1960	W Rudolph	USA	11,0
1968	W Tyus	USA	11,0
1972	R Stetcher	East Germany	11,07
1980	L Kondratyeva	Soviet Union	11,06
1984	E Ashford	USA	10,97
1988	F Joyner	USA	10,54
1992	G Devers	USA	10,52
1996	G Devers	USA	10,94

2. Now arrange the names in order of times from slowest to fastest.

Year	Name	Country	Time in seconds
1928	E Robinson	USA	12,2
1932	S Walasiewicz	Poland	11,9
1972	R Stecher	East German	11,07
1980	L Kondratyeva	Soviet Union	11,06
1968	W Tyus	USA	11,0
1960	W Rudolph	USA	11,0
1984	E Ashford	USA	10,97
1996	G Devers	USA	10,94
1988	F Joyner	USA	10,54
1992	G Devers	USA	10,52

3. a) Calculate the difference between the record times set up in 1984 and in 1992.
 $10,97 - 10,52 = 0,45$
There is a difference of 0,45 seconds

- b) Which was bigger: the improvement in time between 1984 and 1988, or between 1988 and 1992? Explain how you got your answer.

Between 1984 and 1988: $10,97 - 10,54 = 0,42$

Between 1988 and 1992: $10,54 - 10,52 = 0,02$

The time improvement was greater between 1984 and 1988 as the improvement then was 42 hundredths of a second. The time improvement between 1988 and 1992 was only 2 hundredths of a second.

4. *The Olympic Record times do not always improve from one Games to the next. Find an example in the table to prove this.*

Gail Devers time for the 1992 and 1996 Olympics is an example of times not always improving from one Games to the next.

Her time for the 1996 Games was actually 0,42s slower than her time for the 1992 Games.

5. *What fraction of the runners on the list are from the USA?*

$\frac{7}{10}$ or 0,7 of the runners are from the USA

6. (a) *If the Olympic Games are held every four years, when will the next four Olympic Games take place?*

The next four Summer Olympic Games will be held in 2000; 2004; 2008; 2012

- (b) *In which century or centuries will this be?*

The 2000 Olympic Games takes place in the last year of the 20th century.

The rest of the Games take place in the 21st Century.

HOW WILL THE LEARNERS ACHIEVEMENT BE ASSESSED?

You will need to take note of

- Whether the learners can do an ordering activity with decimals.
- If they can differentiate between faster and slower times i.e. smaller and larger decimals
- Whether they can order times in chronological sequence.
- Whether they can calculate the improvement in times over the years and determine whether times always do increase. (To do this they will have to find the difference in times from year to year.)
- Whether they know that 2000 is actually the last year of the 20th century and the 2000 Games actually falls in the 20th century and not the 21st.

UNIT 4: LET'S MEET THE CHAMPIONS

DURATION: This unit should last take about 4 hours to complete

CLASSROOM ORGANISATION:

Activity 4.1 This could start out as a class reading activity. Thereafter learners can work in groups to discuss the advice that Marion Jones has left for aspiring young South African athletes.

Activity 4.2 Learners can work individually or in pairs to answer the set of tasks given in this activity.

Activity 4.3 It is suggested that learners work here in pairs.

Activity 4.4 We suggest that learners work on their own to complete this activity.

Activity 4.5 We suggest that learners also work on their own to complete this activity.

Activity 4.6 Learners should discuss the issues raised in this activity with their partner, or with the rest of their group.

RESOURCES NEEDED: Try to find records of SA Youth Athletics Champions, school records and any additional information on some of the world athletes that are mentioned. Data and photographs of popular champions often appear in the sports sections of newspapers. Keep an eye open for some of these and encourage learners to do the same. These pictures and articles can be displayed on the classroom walls.

Activity 4.1 INTRODUCING MARION JONES

WHAT ARE THE OUTCOMES FOR THIS ACTIVITY?

The learners should be able to

- say who Marion Jones is
- discuss Marion Jones' message to the South African youth with the rest of the members of their group

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- In this activity, Marion Jones is introduced as a role model for young learners. As she has spent time in South Africa, learners should be interested to know more about her.
- Learners are asked to reflect on Jones' message to young athletes which is "*You must follow your hearts and not listen to negative people. Everything is possible.*", and to discuss what she said with the rest of their group.

Some further discussion points:

- 1) How do learners feel about her message? Is what she is saying true?
- 2) Do one's own negative thoughts and other people's negative attitudes play a part in discouraging people?
- 3) How is it possible to overcome negative thoughts and feelings?
- 4) Can learners think of any examples in their own lives where thinking positively helped them to achieve the goals?
- 5) How can learners set themselves realistic goals - both on the sports field and in the classroom?
- 6) In what ways can people be beautiful?

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED?

Encourage everyone to contribute to the discussion. Try to include all the learners - even the quiet ones - by asking them open-ended questions.

Open-ended questions are questions that do not have "yes" and "no" as an answer.

e.g. The question "What is 2 plus 3 equal to?" is NOT open-ended as there is only one correct answer to it.

The question "What numbers could be added together to give 5?" gives many answers. The answers could be 0 and 5; or 1 and 4; or 2 and 3; or 3 and 2; or 4 and 1; or 5 and 0; or $\frac{1}{2}$ and $4\frac{1}{2}$ etc. It could stimulate a discussion as to whether '0 and 5' and '5 and 0' are the same answers. The discussion could go on to adding fractions and decimals. In other words a very rich discussion could arise from the one question.

Activity 4.2 WORKING TO BE A CHAMPION

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to

- order Linda's times from fastest to slowest
- compare her time for the 100m sprint to the time on the list used in Activity 3.2 of the woman who set up the fastest time for the 100m sprint.
- work out Linda's average time for the season for the 100m sprint.

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- In this activity, we learn more about Linda, and the training that she does.
- The learners are encouraged to work on these activities on their own.
- By answering the questions, they are revising ordering decimals, subtracting and adding decimals, dividing decimals by a whole number and working out an average (a concept to which they were introduced in the first module).

ANSWERS FOR ACTIVITY 4.2

1. *Mr Williams has kept a record of Linda's times for the last ten times she ran the 100m. He has written them in event order.*

a) *Write Linda's times in order from fastest to slowest.*

event 3	13,11 seconds
event 6	13,15 seconds
event 2	13,18 seconds
event 9	13,24 seconds
event 8	13,29 seconds
event 10	13,3 seconds
event 1	13,49 seconds
event 7	13,49 seconds
event 5	13,56 seconds
event 4	13,91 seconds

- b) Compare her times with those of the Women Olympic record holders in the table you used in Activity 3.2. How much slower is Linda's fastest time than that of the fastest Olympic record time?

The fastest Olympic record time is 10,52 seconds and it was set by Gail Devers of the USA in 1992.

Linda's fastest time is 13,11 seconds

$$13,11 - 10,52 = 2,59 \text{ seconds}$$

So Linda is 2,59 seconds slower than Gail Devers.

2. Work out Linda's average time taken to run the 100m sprint.

Linda's average time

$$\begin{aligned} &= \frac{13,49 + 13,18 + 13,11 + 13,91 + 13,56 + 13,15 + 13,49 + 13,29 + 13,24 + 13,3}{10} \\ &= \frac{133,72}{10} \\ &= 13,372 \\ &= 13,37 \text{ (correct to 2 decimal places)} \end{aligned}$$

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED?

As learners will be working on their own, it is only by comparing their answers to others in the class will they be able to find out whether they are working out the answers correctly. Encourage them to compare answers, and to redo questions where their answers differ.

Activity 4.3 TOP FIVE IN THE DISTRICT

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to work out the times, in order, of five girl sprinters.

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- In this activity learners look for clues in the text to find out the times of the five girl runners in order from slowest to fastest.
- They then compare findings in their groups

ANSWERS TO ACTIVITY 4.3

1. Linda : 13,48 seconds
2. Mpho : 13,51 seconds
3. Joyce : 13,62 seconds
4. Bertha : 13,64 seconds
5. Thandi : 13,65 seconds

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED?

This is a problem solving activity. It not only revises addition of decimals, it also requires an understanding of the fact that the faster runner has taken the shortest time to complete a race. In other words, the times need to be arranged from smallest to biggest.

Encourage the learners to discuss the problem with their partner, and to try and work out the solution together.

Activity 4.4 FLORENCE FLO-JO GRIFFITH JOYNER

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to

- say who Florence Griffith-Joyner is.
- compare her times for the 100m and the 200m sprint by multiplying a decimal with a whole number.

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

The learners will work with times set by Florence Griffith-Joyner in order to practise multiplying a decimal by a whole number.

(Florence Griffith-Joyner's maiden name was Florence Joyner - and that is where her nickname of Flo-Jo came from. Her married name was Florence Griffith-Joyner.)

ANSWERS: ACTIVITY 4.4

1. *Look at her two World Record times. Suppose "Flo-Jo"'s 200 metre time was exactly double her 100 metre time, what would it have been?*
100 metre time is 10,54 seconds
Double that is 21,08 seconds

2. *What is the difference between the time you have just worked out and her actual time for the 200 metres?*
Worked out time is 21,08 seconds
Actual time is 21,34 seconds
Difference is $21,34 - 21,08 = 0.26$ seconds

3. *Why do you think that her 200m time is not exactly double her 100m record?*

Learners should be able to express their understanding of the concept that: the longer an athlete's race, the slower they will run. i.e that is difficult to maintain the same speed over a longer distance

4. *What is the difference between her 100m time, and Linda's fastest time for the 100m?*

Flo-Jo's world record time is 10,54 seconds
Linda's fastest time is 13,11 seconds
The difference is $13,11 - 10,54 = 2,57$ seconds

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED?

Once again, as they are working on their own, learners should be encouraged to compare answers, and to redo questions where their answers differ.

Activity 4.5 CARL LEWIS - THE GREATEST OF ALL!

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to

- say who Carl Lewis and Jesse Owens are
- calculate differences between their times and the times of other Olympic winners
- relate the dangers of using performance enhancing drugs such as steroids
- suggest reasons for the improvement of champions' times over the years

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- The learners are introduced to the two great Olympic athletes Jessie Owens and Carl Lewis.
- They then go on to comparing the times of the men sprinters to some of the Women Champions of the day. By comparing results and doing calculations, they notice how the times for both races have improved over the years.
- Learners should be able to identify some of the reasons for this e.g. a more healthy diet, improved training conditions, improved track conditions etc.
- They will also notice from their calculations that while men remain faster than women, women's times are improving at a faster rate.
- In the process they practise subtracting decimals and working out averages.
- The learners are introduced to the incidence of drug use in sport.

ANSWERS TO ACTIVITY 4.5

	100 metres in seconds	200 metres in seconds	4 x 100m Relay in seconds
Jessie Owens	10,3	20,7	46,9
Carl Lewis	9,99	19,80	41,65

1. *What is the difference in time between*
 - a) *Jessie Owens' 100m time and Carl Lewis' 100m time?*
 $10,3 - 9,99 = 0,31$ seconds
So, Carl Lewis was 0,31 seconds faster than Jessie Owens.
 - b) *Jessie Owens' 200m time and Carl Lewis' 200m time?*
 $20,7 - 19,80 = 0,9$ seconds
So, Carl Lewis was 0,9 seconds faster than Jessie Owens.
2. *How many years were there between the year that Jesse Owens set his Olympic record times, and the year that Carl Lewis set his Olympic record times?*
 $1988 - 1940 = 48$ years
3. *The 100m Olympic woman's record holder in the same year that Jesse Owens won his 4 medals was Helen Stephens. Her time was 11,5s. What is the difference between her time and Jesse Owens' time?*
 $11,5 - 10,3 = 1,2$ seconds
So Jesse Owens was 1,2 seconds faster than Helen Stephens.

4. *What is the difference between Helen Stephens' time and Florence Griffith-Joyner's time for the 100m (which is given in Activity 4.4)?*

$$11,5 - 10,54 = 0,96 \text{ seconds}$$

So Florence Griffith-Joyner was 0,96 seconds faster than Helen Stephens.

5. *Compare both Lewis' and Owens' time with the table listing the times of some of the winners of the Olympic Women's 100m race that is given in Activity 3.2.*

Jessie Owens' time was 10,3 second and Carl Lewis' time was 9,99 seconds

Year	Name	Country	Times In Seconds
1928	E Robinson	USA	12.2
1932	S Walasiewicz	Poland	11.9
1960	W Rudolph	USA	11.0
1968	W Tyus	USA	11.0
1972	R Stetcher	East Germany	11.07
1980	L Kondratyeva	Soviet Union	11.06
1984	E Ashford	USA	10.97
1988	F Joyner	USA	10.54
1992	G Devers	USA	10.52
1996	G Devers	USA	10.94

- a) *What do you notice is happening to the times over the years?*
Both the men's times and the women's times are getting faster.
- b) *Why do you think this is happening?*
Some of the reasons for this are the fact that athletes are eating a more healthy diet, improved training conditions, improved track conditions etc.
- c) *Are the women becoming as fast as the men?*
Between 1940 and 1984, the men's time improved by 0,31 seconds
Between 1932 and 1984, the women's times improved as follows:
 $11,9 - 10,97 = 0,93 \text{ seconds}$
So, you can see that while men remain faster than women, women's times are improving at a faster rate than men's.

6. *You have already learnt about averages. Now work out the average time taken to run the 100m by each member of the 4 x 100m teams in 1936 and in 1998. How do these times compare?*

$$\text{Average time taken in 1940} = \frac{46,9}{4} = 11,725 \text{ seconds}$$

$$\text{Average time taken in 1984} = \frac{41,65}{4} = 10,4125 \text{ second}$$

$$11,725 - 10,4125 = 1,3125 \text{ seconds}$$

So the average time taken in 1984 was 1,3125 seconds faster than the average time taken in 1940. The difference in the relay times is quite a bit more than the difference in the 100m times. This is, possibly, because in 1940 the rest of the runners in the relay team weren't as fast as Jesse Owens, whereas, in the 1984 relay team, the rest of the runners' times were very close to Carl Lewis' time.

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED?

As they are working on their own, learners should be encouraged to compare answers, and to redo questions where their answers differ.

Activity 4.6 CAN WOMEN RUN AS FAST AS MEN?

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to

- compare the improvement over the years in the mens' Olympic record times and in the women's Olympic record times for the 100m sprint.

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- Through calculating they will notice that women's times are increasing at a faster rate than the men's are.
- This can lead to interesting discussion about whether they think that women sprinters will one day be as fast their male counterparts.

ANSWERS TO ACTIVITY 4.6

<i>Olympic Records for the 100m men and women's races in 1932 and 1992</i>		
<i>Dates</i>	<i>Men's time in seconds</i>	<i>Women's time in seconds</i>
1932	10,38	11,9
1992	9,96	10,82

1. *Who has improved more: men or women?*
Men's improvement = $10,38 - 9,96 = 0,42$ seconds
Women's improvement = $11,9 - 10,82 = 1,08$ seconds
2. *By how much?*
 $1,08 - 0,42 = 0,66$
The women's time has improved by 0,66s more than the men's has.
3. *Is Linda correct? Do you think that women can one day be as fast as men?*
By noticing these differences learners should be able to suggest that it may be possible that in another 30 years the times of women and men may have equalised.

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED?

As they are working on their own, learners should be encouraged to compare answers, and to redo questions where their answers differ.

UNIT 5: DISTANCE RUNNING

DURATION: This unit should take about 5 hours to complete.

CLASSROOM ORGANISATION:

Activity 5.1 starts with individual work. Learners then ask each other questions they have made up from their reading of the passage.

As learners have already been given many opportunities to work in pairs or in groups throughout this module, allow them to work through **Activities 5.2 - 5.5** alone so that you can assess how much they have each learnt so far. If some of them struggle allow for pair work.

Introduce the passage given in **Activity 5.6** as a class reading activity, followed by a class discussion

With **Activity 6.7**, allow learners to work on their own once again.

RESOURCES NEEDED :

- Any additional information on long distance and marathon runners will enrich the module.
- A digital watch that record hours, minutes and seconds will help learners to understand this method of recording time.
- While it good practice for learners to draw their own 100 grids, you may want to save time by having them use printed squares on quad or graph paper.
- Learners are asked to collect examples of the fat content of different foods from labels. You may ask them to bring labels of foods that have been used up as well as prepare a collection of your own to assist learners who find it difficult to access such information.

There are 7 Activities in this unit

Activity 5.1 LOCAL HEROS

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to

- say who Sydney Maree is
- make up three questions about his life
- answer questions about him made up by others in the class.

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- Learners must read through the text in pairs, and then make up their own questions based on the information.
- You can mediate some interesting discussion around some of the following issues:
 - a) Forced removals – What were they? Why did they happen? What were the effects of them?
 - b) Why did Maree not believe that the crowd was cheering him on?
 - c) What were the benefits of Maree going to America in the 70's?
 - d) In what way can sports stars be role models to the youth of today?

Activity 5.2 TIMES FOR THE 1500m RACE

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to

- work with times that are given in minutes, seconds and fractions of a second
- compare times for the men's and women's 1500m races.

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- Learners must record time written as minutes and seconds, and then compare the slowest with the fastest times.
- They then look at the improved performance of men and women in the 1500m over a period of 20 years
- They compare the changes in women's time in shorter and faster races and review Linda's argument about women champion runners eventually being able to catch up with their male counterparts.

ANSWERS TO ACTIVITY 5.2

1. Write the names in order from slowest to fastest

ATHLETES' NAME	YEAR	PLACE	TIME
H Boulmerka	1992	Barcelona	3:55:30
P Rono	1992	Barcelona	3:40:12
F Ruiz	1988	Seoul	3:35:96
S Coe	1984	Los Angeles	3:32:53

2. What is the difference between the slowest man's time and the fastest man's time?
slowest man's time is 3:40:12 = 3 minutes 40,12 seconds
fastest man's time is 3:32:53 = 3 minutes 32,53 seconds
difference = 3 minutes 40,12 seconds - 3 minutes 32,53 seconds
= 7,59 seconds
3. What is the difference between Boulmerka's time and Rono's time?
Boulmerka's time is 3:55:30 = 3 minutes 55,30 seconds
Rono's time is 3:40:12 = 3 minutes 40,12 seconds
difference = 3 min 55,30 sec - 3 min 40,12 sec = 15,18 seconds
4. Work out the average of the times run by the three men.

$$\begin{aligned}\text{Average time} &= \frac{3 \text{ min } 32,53 \text{ sec} + 3 \text{ min } 35,96 \text{ sec} + 3 \text{ min } 40,12 \text{ sec}}{3} \\ &= \frac{9 \text{ min} + 108,61 \text{ sec}}{3} \\ &= \frac{9 \text{ min}}{3} + \frac{108,61 \text{ sec}}{3} = 3 \text{ min} + 36,20333 \text{ sec} = 3 \text{ min } 36,20 \text{ sec}\end{aligned}$$

5. *Sydney Maree's US record for the 1500 metres is 3:29:77. How much faster is this than Sebastian Coe's time?*
 Sydney Maree's time was 3:29:77 = 3 min 29,77 seconds
 Sebastian Coe's time was 3:32:53 = 3 min 32,53 seconds
 Difference = 3 min 32,53 sec - 3 min 29,77 sec
 = 2,76 seconds
6. *Makhaya also compared the women's times and the men's times in this race in 1972 and 1992.*
- a) *What is the difference between the men's time in 1972 and the women's time in 1972?*
 men's time = 3 min 36,3 sec
 women's time = 4 min 1,4 sec
 difference = 4 min 1,4 sec - 3 min 36,3 sec
 = 3 min + 60 sec + 1,4 sec - 3 min - 36,3 sec
 = 61,4 sec - 36,3 sec
 = 25,1 seconds
- b) *What is the difference between the men's time in 1992 and the women's time in 1992?*
 men's time = 3 min 40,12 sec
 women's time = 3 min 55,3 sec
 difference = 3 min 55,3 sec - 3 min 40,12 sec
 = 15,18 seconds
- c) *What do you notice about these two differences in time?*
 Women are getting faster
- d) *What is the difference between the men's time in 1972 and in 1992?*
 difference = 3 min 40,12sec - 3 min 36,3 sec
 = 3,82 sec
- e) *What is the difference between the women's time in 1972 and 1992?*
 Difference = 4 min 1,4 sec - 3 min 55,3 sec
 = 6,1 seconds
- f) *What do you notice about these differences in time?*
 The women's time has improved far more than the men's times.
- f) *Do you think Linda's idea that women will one day catch up with men is also true for long distance? Give a reason for your answer.*
 Women are improving their times at a faster rate than men are. The reasons for this are multifold: One reason is that women are given far more opportunities to get to the top than they were before. This is not necessarily so in South Africa but certainly in countries like the USA. Training. Schedules have become far more scientific and we know far more about diet and exercise than ever before. Stereotypes about men being better in most things than women are fast breaking down. This will have an impact on women's performance and confidence.

Activity 5.3 MORE FUN WITH TIME ...

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to

- Convert times from minutes, seconds and fractions of a second, to seconds only
- Work out average times to run each 100 m of a 1 500 m race.

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- Learners work out the time taken to run 100 m over a 1500m distance –*assuming that the runner runs at the same rate.*
- They must convert the minutes into seconds to make it easier to calculate
- They also round off the fractions of a second, rather than work with fractions of a second.
- They practise using this method twice more.
- They round off other times to the nearest second and the nearest tenth of a second

ANSWERS TO ACTIVITY 5.3

1. *Use the same method to work out the time taken by*
 - a) *Sebastian Coe to run each 100m of his race*
Coe's average time per 100m is 14,2s
 - b) *Boulmerka to run each 100m of his race.*
Boulmerka's average time per 100m is 15,7s
2. *Round off the following times to the nearest second.*
a) 3:56 b) 3:08 c) 3:42 d) 4:00
3. *Round off these times to the nearest tenth of a second*
a) 3:09:3 b) 3:59:1 c) 3:44:8

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED?

Learners will have already been introduced to averages in Module 1 of this material. They need to have some understanding of the concept of an average before tackling these examples. They may use a calculator to solve the problem or do them manually.

They need to know that in order to divide the time given by 15 they will have to convert the minutes into seconds, adding in the fractions of a second before dividing by 15.

Activity 5.4 MAKHAYA'S EARLY MORNING TRAINING PROGRAMME

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to:

- Read a simple table that records daily distances run
- Add kilometres and metres
- Convert metres to kilometres and metres
- Draw up a new table with additional information

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- Learners calculate the total distance Makhaya runs every week.
- They convert this time into metres
- They work out how many times he ran a distance of 1500m in his practice time
- They calculate how many times he had run around the track.
- They then construct their own timetable that shows Makhaya running 55 km per week.

ANSWERS TO ACTIVITY 5.4

1. a) *How far did he run altogether that week?*
He ran 30 km
b) *Write this amount in metres*
30 000m
2. *How many 1 500m races is this equal to?*
He ran 1 500m, twenty times
3. *If the track was 400m long, how many times did he run around the track altogether?*
He ran around the track 75 times

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED?

Learners will have to show that they understand of the metric system to solve the questions. They must be able to add kilometres and metres together. They must know how to convert from metres to kilometres and visa versa. Learners should be able to manage these activities alone as by this time they should feel comfortable working with metric measures.

Activity 5.5 AN ATHLETE'S DIET

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

The learners should be able to

- Read fat content as a percentage and compare the fat content of different foods.
- Work with a 100 grid to shade given percentages
- Interpret 100 grids that are already shaded as a percentage, common fraction and decimal fraction

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- Learners look at a table giving information about the fat content of various fast foods
- They have to select the food with the lowest fat content by comparing percentages
- They must map out a 100 grid in their books and show the percentage of fat that the food with the highest fat content has.
- They then collect information from food labels that give the fat content
- They then express shaded areas of 4 x 100 grids as percentages, common fraction and decimal fractions.

ANSWERS TO ACTIVITY 5.5

1. *Makhaya wants to order different two items from the menu. What should he choose if he wants to keep his fat intake as low as possible?*
The hamburger and the chips together would give the lowest fat content: 88%
2. *If he badly wanted to eat chicken, which piece should he choose?*
The chicken wing as it has a lower fat content
3. *Which item has almost 20% more fat than a packet of chips?*
The chicken wing has 18% more than the chips(2% short of 20%)
3. *Draw a grid and shade in the blocks to show the item on the list with the highest percentage fat.* - They should shade in 39 blocks to show the 39%.fat contained in a hamburger

8. Write the shaded portion as a percentage; decimal fraction and a common fraction
- a) 39%; 0,39; 39/100
 - b) 40%; 0,40; 2/5
 - c) 9%; 0,09; 9/100
 - d) 8%; 0,08; 2/25

HOW WILL MY LEARNERS' ACHEIVEMENT BE ASSESSED?

- Learners should be able to work on these activities individually and only in pairs if they are struggling.
- Once they have finished they can share ideas with a friend or in the group.
- Learners should be able to express the idea that a per cent is just another way of expressing a fraction out of 100.
- They should be able to work with the 100 grid as a way of showing percentages.
- They should be able to move freely, converting percentages into common fractions, decimal fractions - in any order
- The diets that they design themselves should show that they understand the difference between high fat and low fat diets and can read the labels of different foods which show
- The fat content as being high or low either as a percentage or as a decimal fraction of the overall food contents.

Activity 5.6 JOSIAH THUGWANE - OLYMPIC MARATHON WINNER

WHAT ARE THE OUTCOMES OF THIS ACTIVITY?

- Learners will learn more about the life of one of South Africa's famous athletes - Josiah Thugwane.
- They will be able to visualize how long the 42.2km Olympic Marathon is by comparing it with journeys or distances learners may have covered themselves
- They will be able to divide km by metres by converting the kilometres into metres.

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- Learners are told about the success of Josiah Thugwane's running career and the obstacles that faced him along the way.

Use the information about Thugwane to discuss some of the following issues:

- What do learners think it was that made Thugwane overcome his difficulties and become a champion?
- What does the story tell you about his bosses?
- Is Josiah a role model to the youth? If so how?

- Learners estimate how long they think a journey of 42.2 kilometres would be
- They must then calculate how many times a runner would have to go around a track if he were to run 42,2 kilometres
- They must then work out how long a half marathon is by dividing the distance by 2

ANSWERS TO ACTIVITY 6.6

2a) 42.5 = 42 500 metres
The length of the track is 400 m so a runner would have to run 106.25 times around the track.

b) A half Marathon is 21.25km

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED?

Most learners should be able to work on these answers individually. If they are struggling allow them to work in pairs.

As they have already done some work in trying to estimate and visualize the length of a metre, they should be able think about longer distances and reflect on the distance of the Marathon

To assist them find out some real distances that could fall within marathon distances e.g. the distance between Pretoria and Johannesburg, Benoni and Germiston. This will give them a basis on which to visualize how long the Olympic Marathon is.

Activity 5.7 WORKING AGAIN WITH TIME

WHAT ARE THE OUTCOMES OF THE ACTIVITY?

The learners should be able to:

- Use the correct notation to show times in hours, minutes and seconds,
- Order times in hours minutes and seconds from fastest to slowest
- Compare two times and find the difference between them

WHAT WILL BE DONE TO ACHIEVE THIS LEARNING?

- Learners are introduced to times for longer races like marathons that are written in hou's minutes and seconds
- They must then write given times in the correct shorthand way.
- They then order a series of marathon times from fastest to slowest
- They compare Thugwane's time with another Olympic Record holder

ANSWERS TO ACTIVITY 5.7

- 1a) 3: 45:6
1b) 2:39:18

- 2a) 313,02 minutes b) 294,5 minutes 122,1 minutes

- 3a) Carlos Lopes 2:09:21 b) 3 minutes 15 seconds
Frank Shorter 2:12:19
Thugwane 2:12:36
A Bikila 2:15:16

HOW WILL THE LEARNER'S ACHIEVEMENT BE ASSESSED?

The learners could work together in pairs for these activities

They must be able to show that they can both decode a time given in the correct notation and express time using the correct notation themselves.

They need to know:

- that the minutes means fractions of an hour
- that the seconds mean fractions of a minute.

In the case of the times for these longer distances, the fractions of a second are not being recorded and they are not therefore counting in tenths and hundredths but in groups of 60

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