

# **Mathematical Literacy, Mathematics and Mathematical Sciences Illustrative Learning Programme**

## **Grade 7**

### **Module 2: SPORT**



## **LEARNER'S MATERIAL**

## UNIT 1: INTRODUCING LINDA AND MAKHAYA

- *In this unit you will get to meet Linda and Makhaya, the two young athletes whose running career we follow through the Module*
- Read the information about Linda and Makhaya given in the box.

- Linda and Makhaya are both 13 years old. They both attend the same primary school in Cullinan near Pretoria.



- They are both talented athletes and take part in as many local school competitions that they can. To do this they train hard every day throughout the year
- Linda is the school's champion girl sprinter. She runs in the 100 metre and 200 metre races, and in the 4x100 m relay. She also does well in the long jump.
- Makhaya generally comes first in the 1 500 metre, 3 000 metre and 5 000 metre races.
- Their trainer Mr. Williams, a maths teacher at the school, is their athletics coach.
- Like many young sports stars, Linda and Makhaya have their heroes.
- Linda's hero is Marion Jones from the USA - one of the best women sprinters in the world today. When Marion Jones visited South Africa in the spring of 1998, Linda and three of her schoolmates were chosen to attend a coaching session, held by the star.

- Makhaya is a long-distance runner. His hero is the world famous South African Marathon runner, Sydney Maree, who also came from Cullinan. Like Sydney Maree, Makhaya runs in the 1 500m, 3 000m and 5 000m races. When Sydney Maree returned to South Africa after living in America for a long time, Makhaya wrote to him, telling him how much he admired him. Sydney Maree replied, and sent him an autographed photograph, which Makhaya now has on his wall.

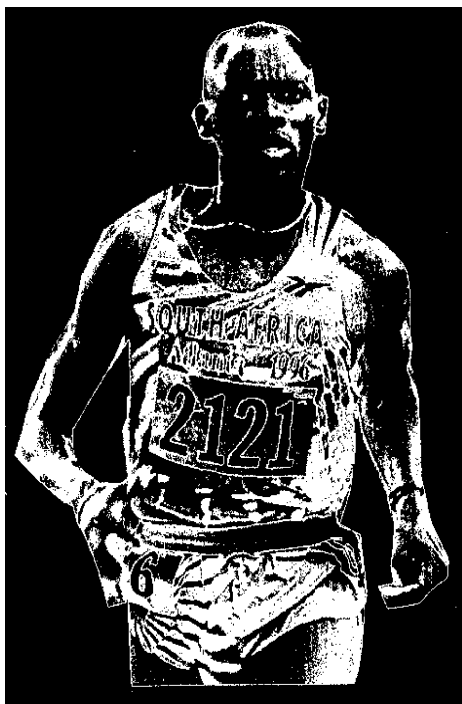
- Work with your partner.

1) Write down at least 5 facts about Linda from the information in the above box.

2) Write down at least 5 facts about Makhaya from the information in the above box.

3) (a) Write down the names of as many famous South African athletes as you can.

(b) Compare the names that you wrote down with those written down by the rest of the members of your class. Write down the ones you missed.



## UNIT 2: LET'S FIND OUT ABOUT ATHLETICS



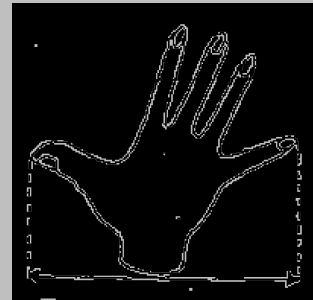
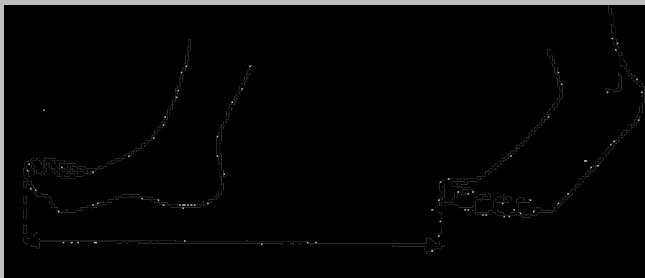
### Activity 2.1      *HOW LONG IS A METRE?*

*In this activity, you will be*

- *estimating how long a metre is*
  - *marking off a metre on a piece of string. (NB: Keep this piece of string for later activities.)*
  - *using the metre long piece of string to measure the distance from the tip of your middle finger to your nose.*
- 
- Read the information given in the box

#### **DID YOU KNOW?**

- The athletes of today run set distances that are measured in **metres** or **kilometres**.
- In the past, races were measured in **feet**, **yards** and **miles**.
- Long before that **paces** and **spans** were used to measure out distances



- Work with your partner.
1. a) Find a space, either in the classroom or outside, for each of you to mark out a length that you think is one metre. (*Don't use any measuring instruments to mark out the distance.*)  
  
b) Measure the distances you each have marked out.  
  
c) Whose estimate was closest to one metre?
  2. On a piece of string accurately mark off a metre. Keep it for other measuring activities.

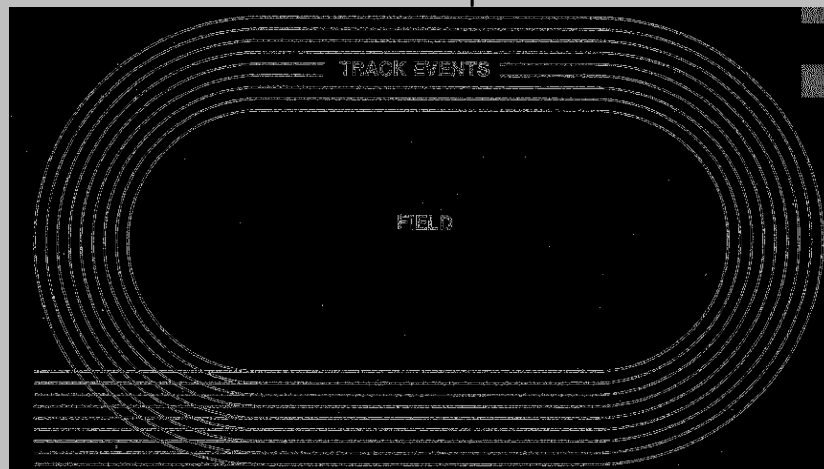
3. Use your "metre string" to measure from the tip of the middle finger of your outstretched hand to the tip of your nose.
  - Is that distance one metre?
  - If it is less than one metre, turn your head away from the string, and measure again. Is that distance one metre?
  - If it is not one metre, use the "metre string" to find out how you can use your body to measure one metre.

## Activity 2.2      **HOW FAR DO ATHLETES RUN?**

*In this Activity, you will have to*

- *find out where the different races start on the athletics track*
- *find out what fraction one race is of another*
  
- Read the information in the box, and then answer the questions

- A standard athletics track is oval in shape and is 400 metres long.



- When we talk about **track athletics**, we are talking about the running races That take place **around** the track.
- When we talk about **field athletics**, we are talking about the events that Take place on the field inside the track e.g. high jump; long jump; discus; javelin, etc
- In **hurdles races**, runners must jump over hurdles. Most of these races have 10 hurdles at equal intervals around the track.

- The following are some of the set distances that are run in track athletics events:

SHORT DISTANCES which are also called SPRINT RACES	100m, 200m, and 400m races
MIDDLE DISTANCES	800m and 1 500m races
LONG DISTANCES	3 000m, 5 000m, and 10 000m races
RELAYS	4 x 100m and 4 x 400m
HURDLE RACES	100m hurdles and 200m hurdles
STANDARD MARATHON	42,2 km

- Work with your partner on the following:
  1. Trace the picture of the athletics track in Activity 2.1 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.
  3. a) Make another mark on your track to show where you think the 1 500 m race starts.
    - b) How many times would you have to run around the track when you compete in the 1 500m race?
  4. a) Make a mark on your 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?
  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?
- Read the information given in the box on the next page. It revises what you know about simplifying fractions, and converting fractions to decimals.

SUPPOSE YOU HAD TO FIND WHAT FRACTION OF THE WHOLE TRACK EACH OF THE RACES IS.

e.g. 1 On what fraction of the whole track does the 100m sprint take place?

ANSWER:  $\frac{100m}{400m} = \frac{1}{4}$

So the 100m race takes place on a quarter of the whole track

e.g. 2 Write the fraction as a decimal

ANSWER:  $\frac{1}{4} = \frac{1,00}{4} = 0,25$

So the 100m race takes place on 0,25 of the whole 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) 200 metres                      b) 50 metres

7. What fraction is the first distance of the second distance?

- a) 100m of 200m  
b) 200m of 400m  
c) 100m of 800m  
d) 200m of 800m  
e) 5 000m of 1 500m

### **Activity 2.3                      KILOMETRES AND METRES**

*In this activity, you will be*

- *Converting distances from metres to kilometres*
- *Finding out how much longer one race is than another.*

You already know how long a metre is.

You probably also know that there are 1 000 metres in a kilometre.

1. In your groups discuss how far you would have to walk to go one kilometre.
  - It could be from home to school
  - It could be from home to the nearest sport field
  - It could be from home to the shops.

- Next time you are in a car or in a taxi, ask the driver if you can see how long a kilometre is.
- Take a reading from the odometer. Make a note of the reading, and then, one kilometre later; see how far you have travelled.
- The odometer is the instrument on the dashboard that registers how far you have travelled. It shows both kilometres and metres.

2. Read the following piece of information:  
Work on your own to answer the questions that follow

#### DO YOU REMEMBER?

- Because there are 1000 metres in a kilometre, when we convert metres to kilometres, we divide by 1 000.

e.g. 1    1 200 metres =  $\frac{1200}{1000} = 1,2$  kilometres

e.g. 2    100 metres =  $\frac{100}{1000} = \frac{1}{10} = 0,1$  kilometres

- 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?

#### **Activity 2.4      MEASURING TIME**

*In this activity, you will*

- *Look at which units of time we use when measuring the time taken to run races of different lengths*
- *Learn how to 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)
- Read the information given in the box:

- To measure an athlete's time we must measure how fast they run over a given Distance.
- Usually athletes run faster if the race is a sprint race than if it is a long Distance race.
- We measure:
  - a) Time taken to run a Sprint in seconds
  - b) Time taken to run a Middle Distance Race in minutes and seconds
  - c) Time taken to run a Marathon in hours, minutes and seconds.

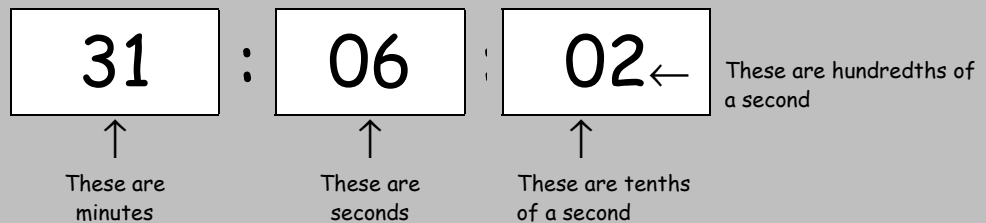
### WHAT INSTRUMENTS ARE USED TO MEASURE THE TIME TAKEN TO RUN A RACE?

- In the past, judges did not have electronic watches like they do today. They Used hand watches or stops watches.
- The time keeper would start his stop watch as soon as he saw smoke coming From the starting pistol.
- Look at this picture of a stopwatch.



- This is an analogue stopwatch.
- There are 4 dark lines between 60 and 5. Do you see that they stand for 1 second, 2 seconds, 3 seconds and 4 seconds?
- Suppose there were 4 lighter markings between each of the dark lines. This would mean that the distance between 2 and 3 seconds, for instance, is divided into 5 equal spaces.
- This means that each of those markings stands for  $\frac{2}{10}$  (or 0,2) of a second.

- Digital stop watches, however, give us times that are accurate to a hundredth of a second.

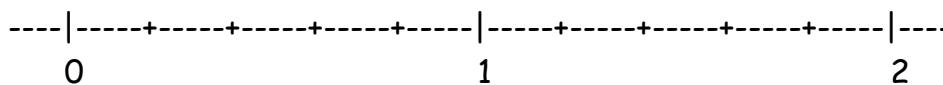


- Today, only *electronic devices* are used in official championships.
- Automatic timers are linked to the starting pistol that is fired at the start of a race.
- The speed of the wind at the time of a race affects results. If the wind speed is too strong (more than 2 metres per second), then any record time set during that race is not recognised.

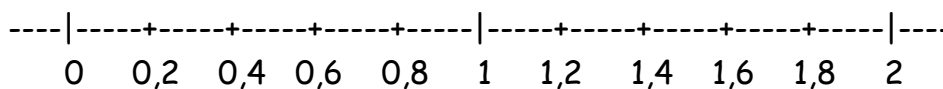
- Work with your partner
- Study the first example, and then answer the questions that follow.

On the stop watch on the previous page, you can count in seconds and two tenths of a second.

- If you represented the time it shows between 0 seconds and 2 seconds on a number line, it would look like this:

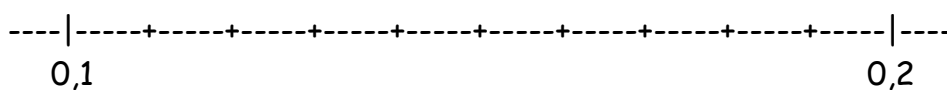


- If we divided the distance between 0 and 1, and then between 1 and 2, into five equal parts, then each part would represent 2 tenths of a second (or 0,2 of a second).



1. We now want you to draw a number line on which you could plot a time between 0 seconds and 1 second in tenths of a second. Follow the following procedure:
  - a) Draw a line about 15 cm long. Mark a point on the left hand side of the line and label it 0 seconds.
  - b) Use 1 cm to represent each tenth of a second. On the number line, mark the position of each tenth of a second, as well as the position of 1 second. (NB: it is important to make sure that the distances between each tenth of a second are exactly the same.)
  - c) On this number line, draw a dot at 0,4 seconds and 0,7 seconds.
  
2. Suppose we needed to draw a number line on which we could plot  $\frac{1}{100}$  (or 0,01) of a second.

- a) Draw a number line like the following one:



- Notice that the distance between 0,1 seconds (or  $\frac{1}{10}$  second) and 0,2 seconds (or  $\frac{2}{10}$  second) has been divided into 10 equal parts i.e. into hundredths.
- b) On the number line, fill in the values at each of the markings between 0,1 and 0,2. (HINT: It is easier to do this if you write 0,1 as 0,10, and 0,2 as 0,20.)
  - c) On the number line, draw a dot at 0,14 seconds and another one at 0,17 seconds.
3. a) Draw a number line like the one in number 2, but this time start it at 10,1 and end it at 10,2. Fill in the values at each of the markings.
  - b) On the number line, draw a dot at 10,14 seconds and another one at 10,17 seconds.

4. a) Draw a number line on which you could show the two times 21,32 seconds and 21,37 seconds.  
b) Which time is faster: 21,32 seconds, or 21,37 seconds?
5. Write these times for a 100 m school girl race from fastest to slowest: 14,53 seconds; 14,23 seconds; 13,98 seconds; 14,67 seconds; 14,09 seconds and 13,79 seconds.

**Activity 2.5      *RUNNING ONE HUNDRED METRES***



*In this activity you will be*

- *Timing members of your class as they run a 100 m race.*
  - *Comparing their times.*
- 
- *Work with your whole class on this activity.*
1. Measure a track that is 100 metres long using the metre lengths of string you made in Activity 2.1.
  2. Select 5 boys in the class to run the 100 metres. The timekeeper should have a watch with a seconds hand.
    - (a) Record the time of each runner.
    - (b) Arrange the times in order from fastest to slowest.
  3. Then select 5 girls in the class to run the 100 metres.
    - (a) Record the time of each runner.
    - (b) Arrange the times in order from fastest to slowest.

4. Use these times to answer the following questions:

- (a) What is the difference in time between the youngest boy's time and the oldest boy's time?
- (c) What is the difference in time between the youngest girl's time and the oldest girl's time?
- (d) What is the difference in time between the tallest boy's time and the shortest boy's time?
- (e) What is the difference in time between the tallest girl's time and the shortest boy's time?



## Activity 2.6      **WHAT IS TEAM SPIRIT?**

*In this activity, you get an opportunity to think about what is meant by "team spirit".*

- Read the information given in the following box:

- Mr. Williams, Linda and Makhaya's athletics coach talks to his athletes about having a good team spirit. He tells them how important it is for everyone to work as a team and to encourage each other in their races.
- Some of the team members hate going to singing practices before the big school matches. They think the songs such as "*Who are, Who are, Who are we? We are the best team you can see*" are stupid.
- Mr. Williams reminds them that it is not only their own hard work and talent that makes them champions, but also the support they get from everyone at school, at home and in the community.
- He shows them this picture to inspire them. It is of SA Youth Champion, Zanelle Grobler being supported by a fellow team member Mandla Nkosi as her 4 x 400m relay team finishes third at the World Youth Games of 1998.



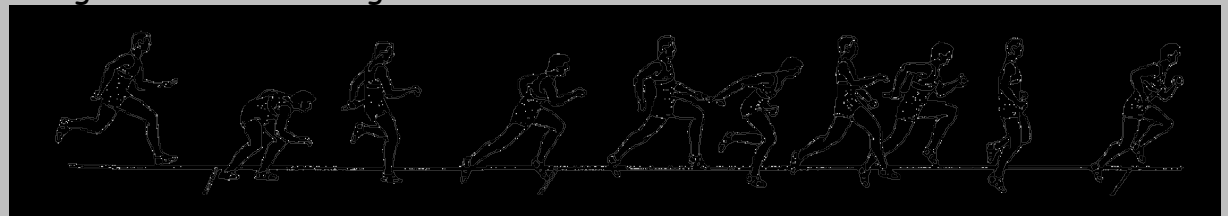
- Discuss with your group
- What do we mean by team spirit?
- Give some examples when people in your school have shown that they have team spirit.

## Activity 2.7      **RELAY RACES**

*In this Activity, you are asked to*

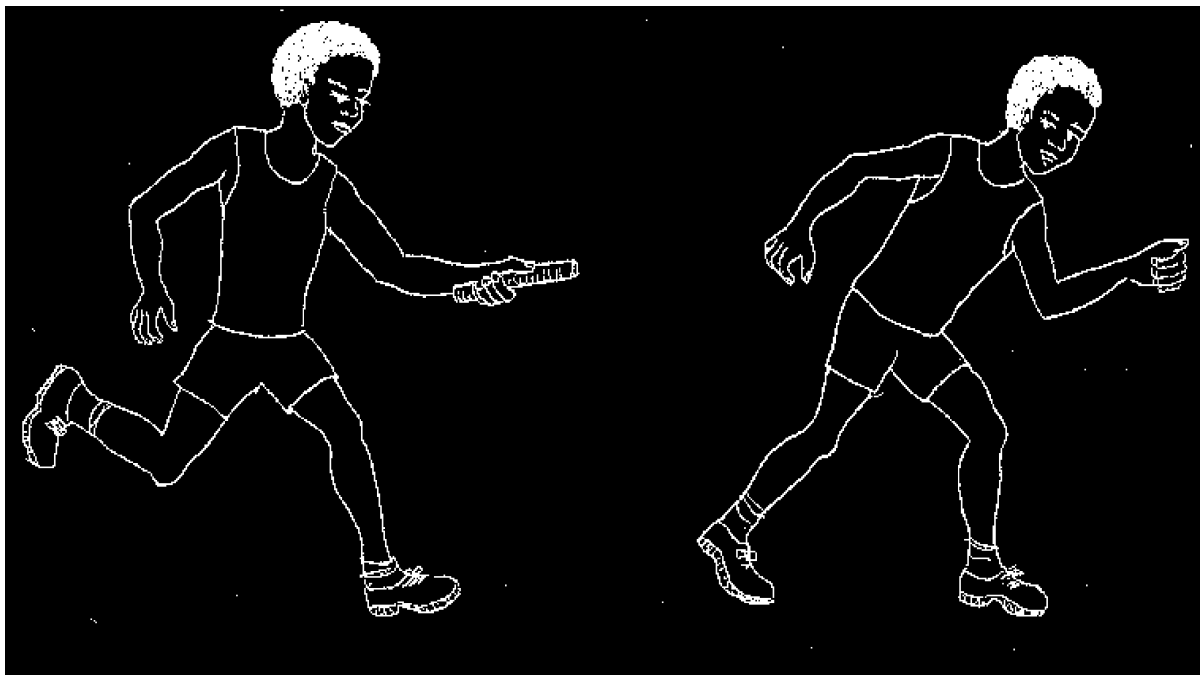
- *Read about how important Team Spirit is in a Relay Race*
  - *Do some calculations to work out how many batons can be made from various lengths of tubing.*
  - *Work out the diameter of a baton.*
- 
- Read the information in the box.

- The relay race is one of the best examples where team spirit is needed.
- If one of the players does not hand over the baton correctly he can spoil the whole team's chances.
- A baton is a smooth circular hollow tube made out of firm material. As one of the team reaches his mark, he hands the baton to the next runner.
- If the baton is dropped it must be picked up by the person who dropped it. This slows the runners down.
- A baton must weigh no more than 50g. Its circumference is 12cm and its length is 28.30 cm long



- Work with your partner to find the following answers:
  - Mr. Williams has a friend who makes batons for the schools' athletics teams.
1. He cuts the batons from a piece of tubing that is 60 cm long
    - a) How many batons can he make from this length?
    - b) How much tubing will he have left over?
  2. How many batons could he make from tubing that is 6m long?
  3. Work out how many batons can be made from tubing that is:
    - a) 346cm long    b) 905,6cm long    c) 2,00m long    d) 5,66m long

- 4 We are told that the circumference of the baton is 12 cm.
- Write down what we mean when we talk about the circumference of a baton.
  - Cut a piece of string 12 cm long, and use it to help you draw a circle with a circumference of 12 cm
  - Measure its diameter( *the longest distance across a circle*).
  - Compare your answer to the other group's answers. Did you all get the same measurement?





## UNIT 3: THE OLYMPIC GAMES

### Activity 3.1 LET'S FIND OUT ABOUT THE OLYMPIC GAMES

*In this Activity, you will*

- *get to know when the first Olympic Games were held in Ancient Greece*
  - *get to know about when the first Modern Olympic Games were held*
  - *get to know about South Africa's involvement with the Olympic Games*
  - *construct a time-line to show the year in which the first of the Ancient Olympic Games were held, and when the first of the Modern Olympic Games were held.*
  - *do calculations involving time.*
- 
- Read the information given in the box below

#### **THE OLYMPIC GAMES - PROMOTING WORLD PEACE**

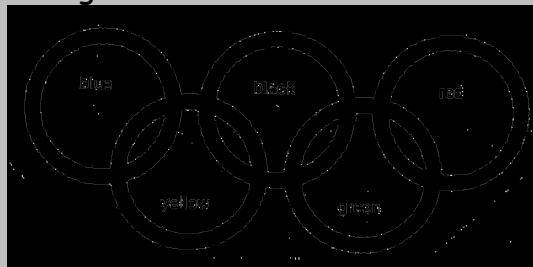
- The Olympic Games is the most famous of all international sporting events. The aim of the Olympic Games is to promote world peace and friendship and to encourage world sport. No nation wins the games though some countries get more gold medals than the others.
- The first Olympic Games were held in Olympia in Greece in 1370 BC. They were held in honour of the Greek God Zeus and lasted for five days. Prizes were laurel wreaths made from the branches of the laurel tree.
- In about 500 AD, the stadium at Olympia was destroyed by an earthquake. In 1895, a Frenchman, Pierre de Coubertin discovered the remains of the stadium and work on restoring it began.
- The first Olympic Games in modern times were held in 1896 in Greece.
- Women only became full participants in the 1928 Antwerp Games

## SOUTH AFRICA AND THE OLYMPICS

- South Africa first took part in the Olympic Games in 1908.
- Because of the racist politics of apartheid, in 1964 the country was banned from entering.
- In 1992 South Africa once again took part in the Olympic Games, which in that year were held in Barcelona. At these games, long distance runner Elana Meyer won a silver medal in the 10 000 metres event.
- In the 1996 Olympic Games in Atlanta in the USA, Josiah Thugwane won the gold medal for the Marathon, the last Olympic event on the programme. Ezekial Sepeng won the silver medal for the 800 metres

## OLYMPIC SYMBOLS

- The Olympic Rings stand for the five continents that participate in the games. The rings are black, blue, green, red and yellow. The flag of every nation competing in the games has at least one of these colours as part of it.

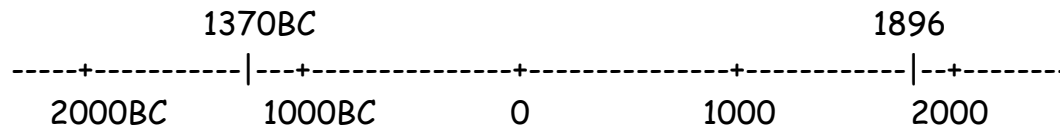


- The Olympic flame is a symbol for the torch that is lit before the start of each games. Torchbearers carry the flame from Greece to the host country This is a way of remembering how the Games began in Ancient Greece



- Now work with your partner to answer the following

Look at this sketch of a time- line



It shows you the time between the first ever Olympic Games in Ancient Greece and the first Olympic Games in Modern Times

- 1) Using jumps of 500 years, construct a time line from 2000 BC to 2000AD. On this time line, plot the two years 1370BC and 1896AD.
- 2) How many years were there between the first Olympic Games in Ancient Greece, and the first Olympic Games in Modern Times?
- 3) How many years were there between the first Modern Olympic games and the 1928 Games where women were first allowed to compete in all events.
- 4) When and where will the next Olympic Games be held?
- 5) How many years are there between the year that the first games were held in Ancient Times and the next Olympic Games?
- 6) For how many years have women been allowed to compete fully in the Games?
- 7) How long ago was South Africa barred from the Games?
- 8) How many years has it been since South Africa was readmitted to the Games?

### **Activity 3.2      *WOMEN'S 100 METRES OLYMPIC RECORDS***

*In this Activity, you will*

- *arrange the names of some of the winners of the Women's Olympic 100m race in order from the earliest date to the latest date.*
  - *then arrange them in order from the slowest time to the fastest time.*
  - *do calculations involving these dates and times.*
- Read the information in the box on the next page.

- Linda has a scrapbook where she keeps as many stories and reports that she can about women sprinters. She finds these in newspapers and magazines.
- She is most interested in Olympic women's sprint records i.e. for the 100m, 200m, and the 4 x 100m relay.

- Work with your partner to answer the following questions:

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

2. Now arrange the names in order of times from slowest to fastest.
3. (a) Calculate the difference between the record times set up in 1984 and in 1992.  
(b) Which was bigger: the improvement in time between 1984 and 1988, or between 1988 and 1992? Explain how you got your answer.
4. The Olympic Record times do not always improve from one Games to the next. Find an example in the table to prove this.
5. What fraction of the runners on the list are from the USA?
6. (a) If the Olympics Games are held every four years, when will the next four Olympic Games take place?  
(b) In which century or centuries will this be?

## UNIT 4: LET'S MEET THE CHAMPIONS

### Activity 4.1      **INTRODUCING MARION JONES**

*In this Activity, you will*

- *find out about Marion Jones, a top American sprinter*
- *discuss Marion's message to the South African youth with the rest of the members of your group.*
  
- Read the information given in the box



- In 1998, Marion Jones from the USA became the new sprinting wonder of The world. She competed, and set up new records, in the 100 metre sprint, 200 metres sprint, the long jump and the 4 x 100 metre relay.
- Early in 1999 she came to South Africa to participate in the Engen Summer Athletics Series. This trip was to help her prepare for the European Summer Season and the World Championships in Spain.
- While in South Africa, she ran clinics to coach talented young sprinters from Soweto and the Cape Flats. She really admired the children she worked with. She said that they were both beautiful and friendly. Part of the message That she left for all the budding young South African athletes was: *"You must follow you hearts and not listen to negative people. Everything is possible!"*

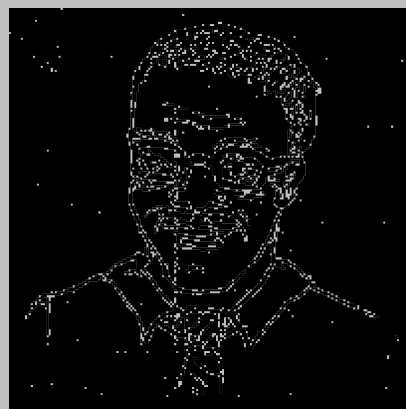
- Now work with your group.
  - Read Marion Jones' message to young athletes.
1. Do you agree with what she says or not. Is her advice only useful for sport, or also for other areas of life? Give examples of where you think her advice would also be useful.
  2. Do you agree with her that "South African children are beautiful and friendly"? Give a reason for your answer.

### **Activity 4.2      *WORKING TO BE A CHAMPION***

*In this activity, you will have 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.*
- Read the information about Linda that is given in the box.

- Mr Williams believes that Linda will one day be a South African Champion.
- He encourages her to train hard, to keep her body in good shape, to eat healthily and to sleep well in between training sessions.
- She is used to training for many hours throughout the season to improve her times.



- Answer these questions on your own.
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.

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

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

- 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?
2. Remember that you worked with averages in Module 1: Farming and Growth. Now Linda wants to work out her average time for the season.
- To do this she knows she must
    - (i) *add together all the times for the 10 races, and then*
    - (ii) *divide this total by the number of races (i.e. by 10)*
  - Use this method to help her work out her average time taken to run the 100m sprint. Show your working out. Round the answer off to 2 decimal places.

### **Activity 4.3      THE TOP FIVE IN THE DISTRICT**

*In this Activity, you will use the clues given to work out the times, in order, of five girl sprinters.*

- Work with your partner.
  - Read the information given and then answer the questions.
  - Mr Williams was only allowed to choose five young sprinters from his school district to attend the Marion Jones' Clinic
  - He gave all the girl sprinters from the five neighbouring schools the chance to run 100 metres. He then chose the top five times. These were run by Linda, Thandi, Joyce, Bertha, and Mpho.
1. Use the clues given in the box below to work out how fast each of them ran.

***Here are the clues.....***

- Thandi was good runner but not as good as Joyce.
- Joyce's best time was 13.62s
- Thandi's time was 0,03s more than that.
- Everyone knew that Linda was the fastest. Her time was 0,14s less than Joyce's.
- Bertha's time was 0,01 s less than Thandi's.
- Lastly Mpho came in 0,11s faster than Joyce.

- Write down the names, and the times of all five girls in order - from fastest to slowest.
2. Compare your answers to those obtained by the rest of your group. If your answers differ, redo your working out together, and see if you now have the same answer. If not, consult with one of the other groups, or with your teacher.



#### **Activity 4.4      FLORENCE "FLO-JO" GRIFFITH-JOYNER**

*In this Activity, you will*

- *find out about Florence Griffith-Joyner, another top American sprinter.*
  - *compare her times for the 100m and the 200m sprint.*
- Read the information about "Flo-Jo" that is given in the box on the next page:



- Florence Griffith-Joyner was one of the greatest women athletes of the century. In 1988, she won 3 gold medals and one silver medal at the Summer Olympics in Seoul, South Korea, and she broke the records for the 100 metre and the 200 metres sprints.
- Her time for the 100 metres was 10.54 seconds and her time for the 200 metres was 21.34 seconds
- Sadly she died of heart failure in 1998. She was only in her thirties.



- Now work on your own to answer the following questions.
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?
  2. What is the difference between the time you have just worked out and "Flo-Jo's" actual time for the 200 metres?
  3. Why do you think "Flo-Jo's" 200m time is not exactly double her 100m record?
  4. What is the difference between "Flo-Jo's" 100m time, and Linda's fastest time for the 100m?

### Activity 4.5

### **CARL LEWIS - THE GREATEST OF ALL!**

*In this Activity, you will*

- *find out about two American sprinters, Carl Lewis, who won four Gold Medals at the 1988 Olympic Games, and Jesse Owens, who won four Gold Medals at the 1940 Olympic Games.*
  - *Calculate differences between their times and the times of other Olympic winners.*
  - *Read about drugs and sport*
- 
- Read the information given about Carl Lewis and Jesse Owens in the box.



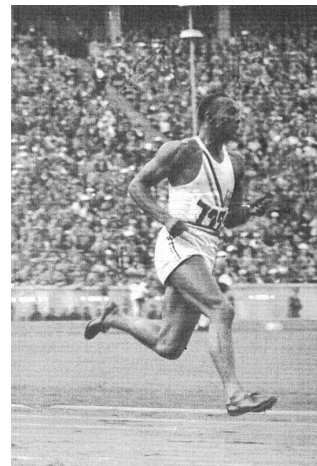
- Mr Williams also has a hero. His hero is the famous African-American runner Carl Lewis.
- Carl Lewis was the star of the Olympic games held in Los Angeles in 1984.
- Then, at the Seoul Olympic Games held in 1988, he won 4 Gold Medals, and equalled the record of another great African-American athlete, Jesse Owens who had won 4 Olympic titles at the 1940 Olympic Games.
- The medals that they won were for the 100 metres, 200 metres, the 4 x 100 metre relay, and the long jump.

- This table shows the times recorded by these two great athletes for the 100 and 200 metre Olympic events. It also shows the times their relay teams took during the same Olympic event.

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

- Work on your own to answer these questions

1. What is the difference in time between
  - (a) Jessie Owens' 100 metre time and Carl Lewis' 100 metre time?
  - (b) Jessie Owens' 200 m time and Carl Lewis' 200 m time?



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?
3. The 100 m 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?
4. What is the difference between Helen Stephens' time and Florence Griffith-Joyner's time for the 100 m (which is given in Activity 4.4)?
  - a) What do you notice is happening to the times in the women's 100m race over the years?
  - b) Why do you think this is happening?
  - c) Are the women becoming as fast as the men?

- 5 You have already learnt about averages. (Turn to Activity 4.2 if you want to refresh your memory.) Now work out the average time taken to run the 100 metres by each member of the 4 x 100m teams in 1936 and in 1998. How do these two times compare?

#### **DRUGS AND SPORT.....**

- In the 1988 Olympics, the world could not believe it ... Canadian sprinter Ben Johnson, who won the gold medal, broke the world 100m record in an Unbelievable time of 9,79 seconds.
- Soon after, it was found that Johnson had been taking *steroids*, a powerful Drug, taken to make you stronger and to help you run faster.
- Johnson was immediately disqualified, stripped of his title, and banned from International sport.
- Carl Lewis' time of 9,92 seconds was declared the official Olympic time

#### **Activity 4.6 CAN WOMEN RUN AS FAST AS MEN?**

*In this Activity, you will compare the improvement over the years in the men's Olympic record times, and in the women's Olympic record times for the 100m sprint.*



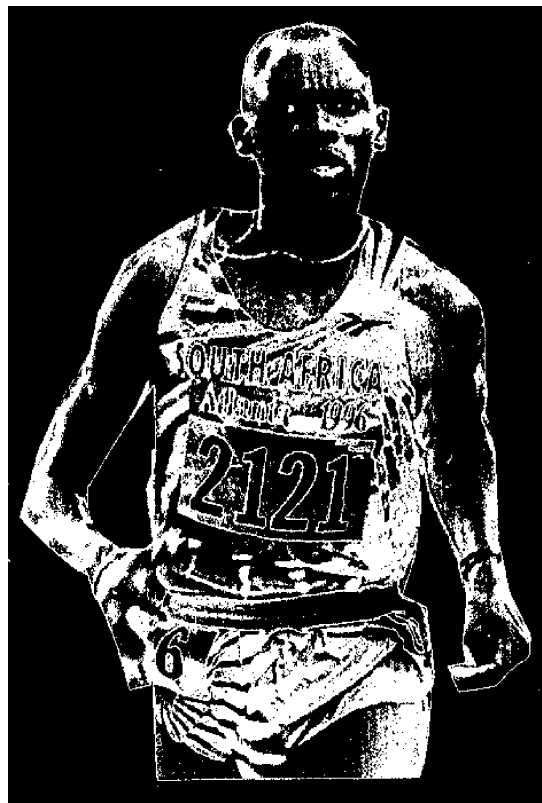
- Makhaya loves to tease Linda. He bets her that women runners will never be able to race as fast as men runners.
- Linda believes differently. She has been working things out. She knows that women sprinters are still not as fast as the men sprinters. But she can see that the women are becoming faster more quickly than the men are.

"Why do you think they call Marion Jones, the female Carl Lewis?" she boasts.

- She draws up a table and shows it to Makhaya to prove her point:

Olympic Records for the 100m men and women's races in 1932 and 1992		
Dates	Men's time in seconds	Women's time in seconds
1932	10,8	11,9
1992	9,96	10,82

- Study the table
  - Compare the times of the men and the women in the 100 metre race in both years.
1. Who has improved more: men or women?
  2. By how much?
  3. Is Linda correct? Do you think that women can one day be as fast as men?



## UNIT 5: DISTANCE RUNNING

### Activity 5.1      *LOCAL HEROS*

*In this Activity, you*

- *read about Sydney Maree*
  - *make up three questions about his life*
  - *give these questions to someone else to answer.*
- 
- Read the information about Sydney Maree in the box



- Sydney Maree was born in Cullinan near Pretoria.
- In 1965 he and his family suffered the fate of forced removals and were taken off their land. After a long hot journey in an open truck, they were dumped in a camp of tents near Hammanskraal.
- His father was imprisoned for his fight against apartheid. Sydney never saw him again. He was brought up by his mother and grandmother.
- Despite these difficulties Maree went on to become one of the greatest long distance runners in the world.
- In 1976 the great marathon athlete was the first South African school boy to run the "mile" in under 4 minutes. (*The mile today has been replaced by the 1500 metre race.*)

- He achieved this great feat in Port Elizabeth. Everybody has their hopes on a young white school boy named Clive Dale, but Sydney led all the way.

At the last 150 metres, "I saw everybody standing up and clapping " he writes " I thought that this was South Africa,- 1976 - they could not be clapping for me!"

"As I crossed the tape I looked back and there Clive Dale was about 25m behind me. The noise in the stadium became a deafening roar!"

- After this win he was offered a scholarship to study in America.
- In 1980 he broke the record for the 5<sup>th</sup> Avenue Mile in New York City. This record still stands today.
- In 1982, while representing the USA, he broke the 1 500 metres US record at the Los Angeles Olympics when he achieved a time of 3:29:77 . This is still the US record today.
- He was again chosen for the US Olympic team for the Seoul Olympics in 1998.
- In 1995, after living in America for 18 years, he returned to South Africa
- "Sport stars must realise that they have a responsibility to provide role models to our youth. I am committed to helping our South African youth find the road to success" he told a journalist recently.

- Work on your own.
- Make up three questions about Sydney Maree.
- Give them to someone else to answer.

## Activity 5.2      **TIMES FOR THE 1500 m RACE**

In this Activity you have to

- work with times for the men's Olympic 1 500m race that are given in minutes, seconds and fractions of a second.
- compare the times set up by women and by men in the Olympic 1 500m races.
- Work on this activity on your own.
- Read the information given in the box.

- Makhaya's favourite race is the 1 500m.
- We read the times taken to run middle distances races in minutes, seconds and fractions of a second.
- Makhaya's best time for the 1 500m is 4:45:39. This means that he took 4 minutes, 45 seconds and 39 hundredths of a second, or 4 minutes 45,39 seconds, to run it.
- Makhaya knows all the best times run by international athletes in this race and sees them as goal to work for.



Look at this table that Makahaya has drawn up of Olympic Records for the 1 500 metres race:

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

1. Write the names in order from slowest to fastest.



2. What is the difference between the slowest man's time and the fastest man's time?
3. What is the difference between Boulmerka's time and Rono's time?
4. Work out the average of the times run by the three men.
5. Sydney Maree's US record for the 1 500 metres is 3:29:77. How much faster is this than Sebastian Coe's time?
6. Makhaya also compared the women's times and the men's times in this race in 1972 and 1992. Study the table on the next page and then answer the questions.

MEN: OLYMPIC 1500 METRES		WOMEN: OLYMPIC 100 METRES	
1972	3:36:3	1972	4:01:4
1992	3:40:12	1992	3:55:3

- a) What is the difference between the men's time in 1972 and the women's time in 1972?
- b) What is the difference between the men's time in 1992 and the women's time in 1992?
- c) What do you notice about these two differences in time?
- d) What is the difference between the men's time in 1972 and in 1992?
- e) What is the difference between the women's time in 1972 and 1992?
- f) What do you notice about these two differences in time?
- g) Do you think Linda's idea that women will one day catch up with men is also true for long distances? Give a reason for your answer.



### Activity 5.3      **MORE FUN WITH TIME.....**

*In this Activity, you*

- *convert times from minutes, seconds and fractions of a second to seconds only.*
- *work out the average time taken for each 100m of a 1 500m race.*
  
- Study the information about Sydney Maree given in the box.

- Sydney Maree's US record time for the 1500 is 3:29:77 (i.e. 3 minutes, 29 seconds and 77 hundredths of a second). Suppose he ran at exactly the same pace for the whole race. What would his time be for each 100m of the race?
- To find out, we would have to divide 3:29:77 by 15. It is not easy to divide 3 minutes 29 seconds and 77 hundredths of a second by 15. It would be easier to divide if we only had one unit.  
3 minutes =  $3 \times 60$  seconds = 180 seconds  
29 seconds and 77 tenths = 29,77 seconds
- So 3 minutes 29 seconds and 77 tenths of a second =  $180 + 29,77$  seconds  
= 209,77 seconds

- To find out how long he took to run each 100m of the 1500 metres, we must divide 209,77 second by 15
- $209,77 \div 15 = 13,984\ 666$  seconds, which rounds off to 13,98 seconds (correct to 2 decimal places)

So he ran each 100 metres in the 1500 metre race in 13,98 seconds.

"That's pretty fast!" Makhaya teased Lindi. "Look at your own times for the 100 metres race. Sydney Maree ran almost as fast as you did, but he kept that speed up for a distance that is 15 times longer than the 100 metres you run!"

"Well, it's a bit unfair to compare a school girl's times with International Olympic athletes!" Linda replied.

1. Use the same method to work out the time taken by
  - a) Coe to run each 100 metres of his race, and
  - b) Boulmerka to run each 100 metres of his race.
  
2. Round off the following times to the nearest second. (Don't forget that there are 60 seconds in a minute, but 100 hundredths of a second in a second.)
 

e.g. 2:45:54 becomes 2:46, and 2:45:23 becomes 2:45

(a) 3:56:09    (b) 3:07:97    (c) 3:41:69    (d) 3:59:85
  
3. Round off these times to the nearest one tenth of a second
 

e.g. 3:45:09 becomes 3:45:1

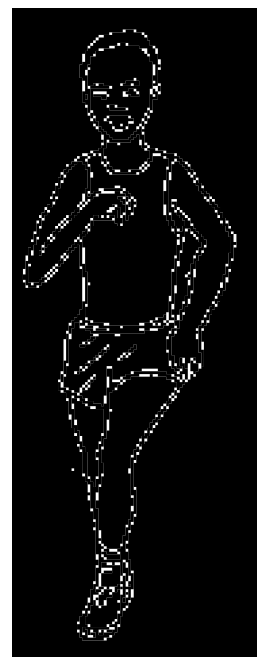
(a) 3:09:26    (b) 3:59:14    (c) 3:44:82

**Activity 5.4      MAKHAYA'S EARLY MORNING TRAINING PROGRAMME**

*In this Activity, you have to*

- study a schedule of the training distances run by Makhaya in one week
- find the total distance run by Makhaya
- draw up a schedule showing the distances Makhaya ran during the school holidays
  
- To keep fit Makhaya takes a bus every morning to the stadium to train before school. He also trains on the weekends.
  
- Makhaya keeps a record of the distances he runs in one week.

MONDAY	3,86 km
TUESDAY	4,28 km
WEDNESDAY	3,71 km
THURSDAY	4,7 km
FRIDAY	3,3 km
SATURDAY	4,79 km
SUNDAY	5,36 km



- Work on your own to answer these questions

1. a) How far did he run altogether that week?  
b) Write this amount in metres.
2. How many 1 500m races is this total amount equal to?
3. If the track was 400m long, how many times did he run around the track altogether?
4. Draw up a time table for a week during the school holidays that shows Makhaya running 6 km more per day than he did in the week shown in the table.

### **Activity 5.5      *AN ATHLETE'S DIET***

*In this activity you get an opportunity to*

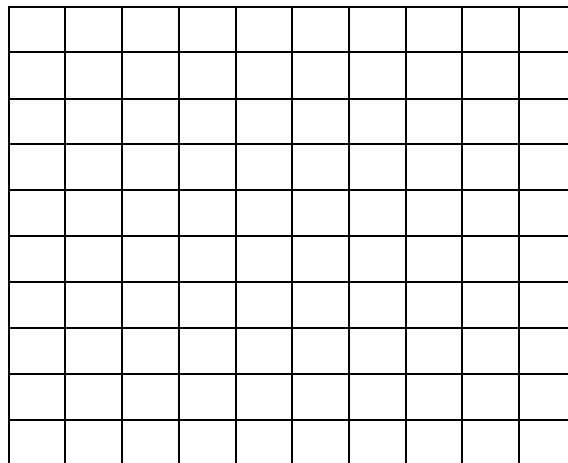
- *study the fat content of certain foodstuffs*
- *write the shaded-in portions of a grid as a percentage, as a decimal fraction, and as a common fraction.*
- Read the information in the box

- Makhaya knows that in order to keep fit he must have healthy diet.
- He knows that his diet should not contain a lot of fat but rather more carbohydrates.
- Sometimes he buys some food from the Fast Food Store on his way home from training.
- He has found out more or less what the fat content of each item is. So he thinks carefully before ordering...

- Work with your partner
- Use the table on the next page to help you answer the questions

ITEM	AVERAGE FAT CONTENT
Hamburger	39%
Potato chips	49%
Cheeseburger	59%
Chicken breast	53%
Chicken drumstick	62%
Chicken wing	67%

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?
2. If he badly wanted to eat chicken, which piece should he choose?
3. Which item has almost 20% more fat than a packet of potato chips?
4. (a) Draw out a grid like this one in your exercise book.



- (b) Shade the right number of blocks to show the item on the list with the highest percentage of fat.
5. Look at some labels of some food items in the supermarket or at home. Write down their fat content.
  6. What kinds of foods are high in fat? What kinds of foods are low in fat?
  7. Design a diet with a very low fat content for an athlete.

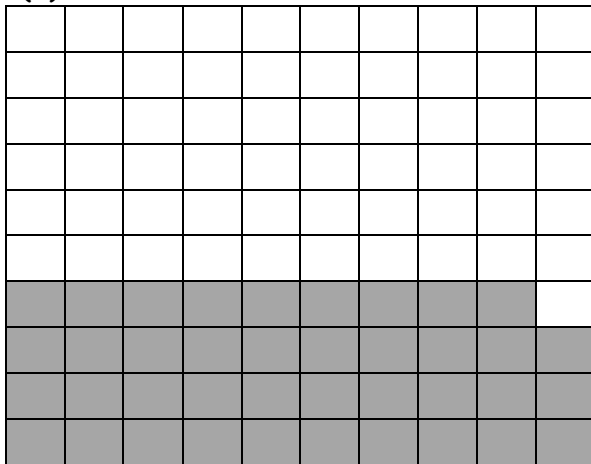
Percentages can be expressed

(a) As a decimal fraction e.g.  $22\% = 0,22$

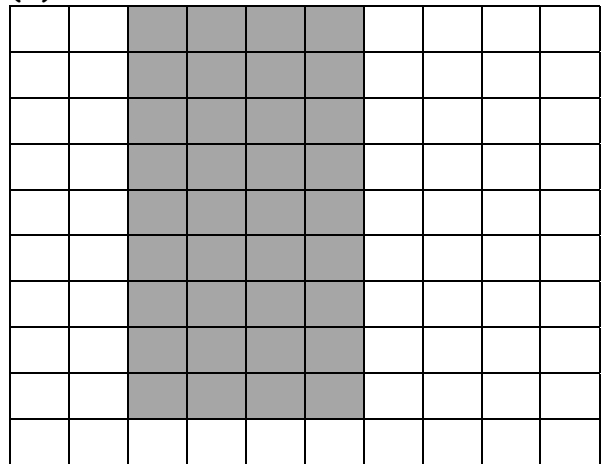
(b) As a common fraction in simplest form e.g.  $22\% = \frac{22}{100} = \frac{11}{50}$

8. Write the shaded section of these 100 grids as (i) a percentage  
(ii) a decimal fraction (iii) a common fraction in simplest form

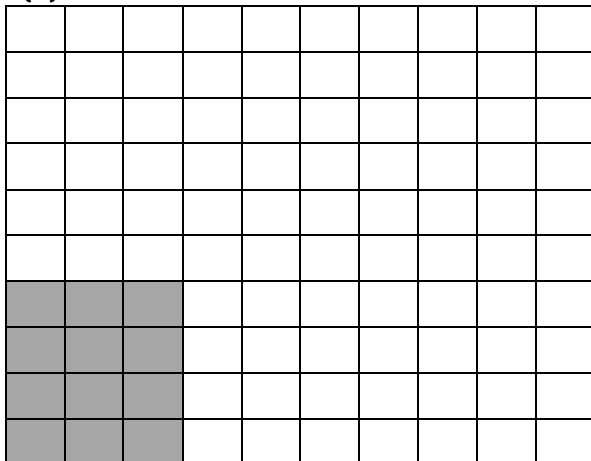
(a)



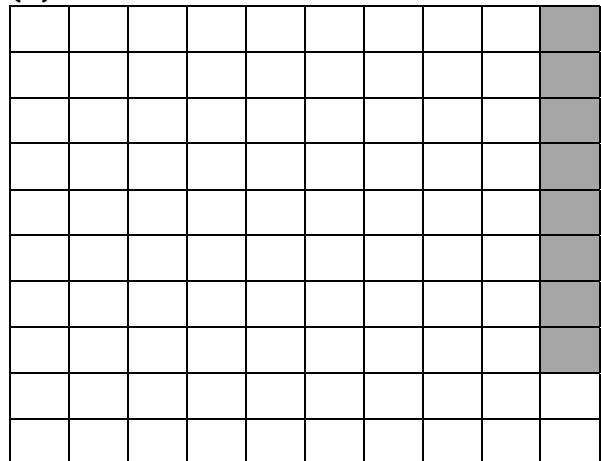
(b)



(c)



(d)

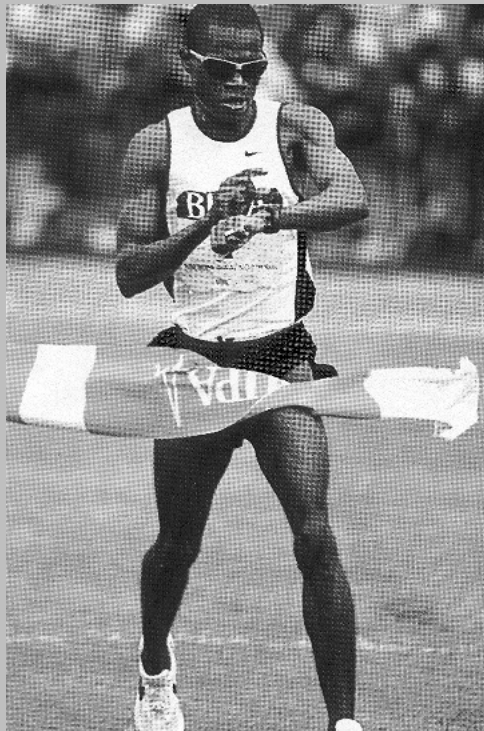


## Activity 5.6

## **JOSIAH THUGWANE - OLYMPIC MARATHON WINNER**

*In this Activity, you*

- *find out details about Josiah Thugwane's life*
- *discuss the distance covered in a Standard Marathon, and compare it to other known distances.*
  
- Read the information in the box about Josiah Thugwane



- In 1996 Josiah Thugwane became the first black gold medallist from South Africa when he won the Olympic Men's Marathon at the Atlanta Olympic Games.

### **JOSIAH'S EARLY LIFE:**

- Thugwane comes from Bethal in Mpumalanga.
- From an early age he experienced hardship and found himself helping having to work to help feed his family.
- He never had much schooling and was forced to work as a herdboys instead.
- It was during this time, that he started to run long distances, out in the open veld in Mpumalanga.

### JOSIAH'S ADULT LIFE

- Later he married and had to support his wife and children.
- He made beer to sell to miners at the local coal mines.
- This was not what he wanted but found it impossible to find other work:

"It was hard in those years, having to put something to eat before the table and one had to make plans." he said in an interview after his great win.

- Later he was offered a job to clean the kitchen on a neighbouring mine. By this stage he had already started to run in local marathons.
- The mine bosses offered him a job to work underground. Josiah was afraid that the dust from the coal would be bad for his running and he refused to do so.
- He came 14<sup>th</sup> in a Marathon in Korea, and was soon known by everyone in the community.

### JOSIAH'S TRIP TO THE OLYMPIC GAMES

- He says that his selection to the SA Olympic team in 1996 was the highlight of his life.
- But there were still some obstacles in his way!
- Just before he was about to go to Atlanta he had his car stolen and was attacked by some hitchhikers to whom he had offered a lift.
- Josiah believes to this day, that the whole incident was a plot by some jealous people in the community to stop him from competing in the Games.
- Fortunately he was able to recover quickly from the incident, and left for Atlanta the next day. The rest is all history.

- Work with your partner.
1. Josiah Thugwane won the Men's Marathon which is 42,2 km long, at the 1996 Olympic Games.
    - (a) Discuss how far you think 42,2 km is.
    - (b) Write down three journeys you may take that would be 42,2 km long.



- (c) Compare your answers in your group
2. The Marathon is usually run on the road, not on an athletics track. Suppose someone decided to run the Marathon on a track which, if you remember, is 400m long.
- a) How many times would the athletes have to run around an athletics track to run 42,5 kms?
- b) What is the length of a *half-marathon*?

### **Activity 5.7      *WORKING AGAIN WITH TIME***

*In this activity, you will*

- *work with time in hours, minutes and seconds*
- Read the information given in the box

- For longer races like marathons, we record the time taken in hours, minutes and seconds

e.g. The short hand way of recording Josiah Thugwane's time for the Marathon is 2:12:36

This means that he took 2 hours, 12 minutes and 36 seconds to run the race

- To convert 2:12:36 to minutes, we do the following:

$$2 \text{ hours} = 2 \times 60 \text{ minutes} = 120 \text{ minutes}$$

$$36 \text{ seconds} = \frac{36}{60} \text{ minutes} = 0,6 \text{ minutes}$$

$$\text{So, } 2:12:36 = 120 + 12 + 0,6 \text{ minutes} \\ = 132,6 \text{ minutes}$$

- Work on your own
1. Write these times in the short hand way:
- a) 3 hours, 45 minutes and 6 seconds
- b) 2 hours 39 minutes and 18 seconds

2. Convert the following Marathon times to minutes:

- a) 5:13:12                      b) 4:54:30                      c) 2:02:06

3. These were the marathon times recorded in the Olympics

Venue And Year	Name Of Winner	Country	Time
Rome 1960	A Bikila	Ethiopia	2:15:16
Munich 1972	Frank Shorter	USA	2:12:19
Los Angeles 1984	Carlos Lopes	Portugal	2:09:21
Atlanta 1996	Josiah Thugwane	South Africa	2:12:36

- a) Order the times from fastest to slowest.  
b) How much faster was Lopes' time than Thugwane's?

