



UNIT 2
Fitness for Sport

NAME:

FORM:

TARGET GRADE:.....

DATE	TEACHER COMMENT	PUPIL COMMENT

1. Knowledge of adaptations to body systems resulting from exercise

The Structure of body systems:

Task: Find a diagram for each system and label using the key words listed for each one.

Cardio vascular system

Atria, ventricles, vena cava, aorta, pulmonary artery, pulmonary vein

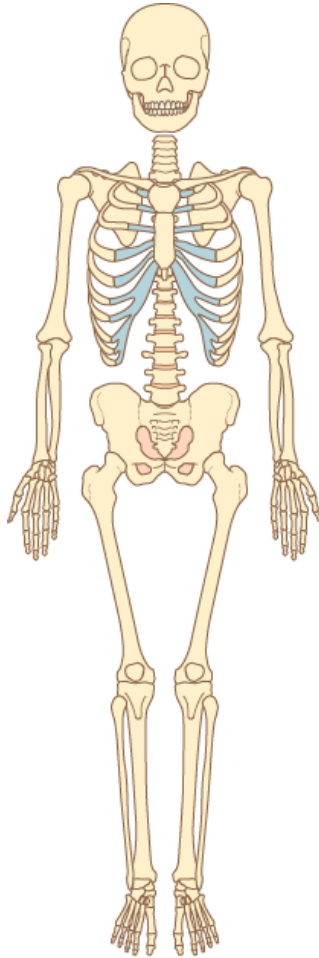
Respiratory System

Larynx, trachea, bronchus, bronchioles, lungs, diaphragm

Muscular-skeletal System

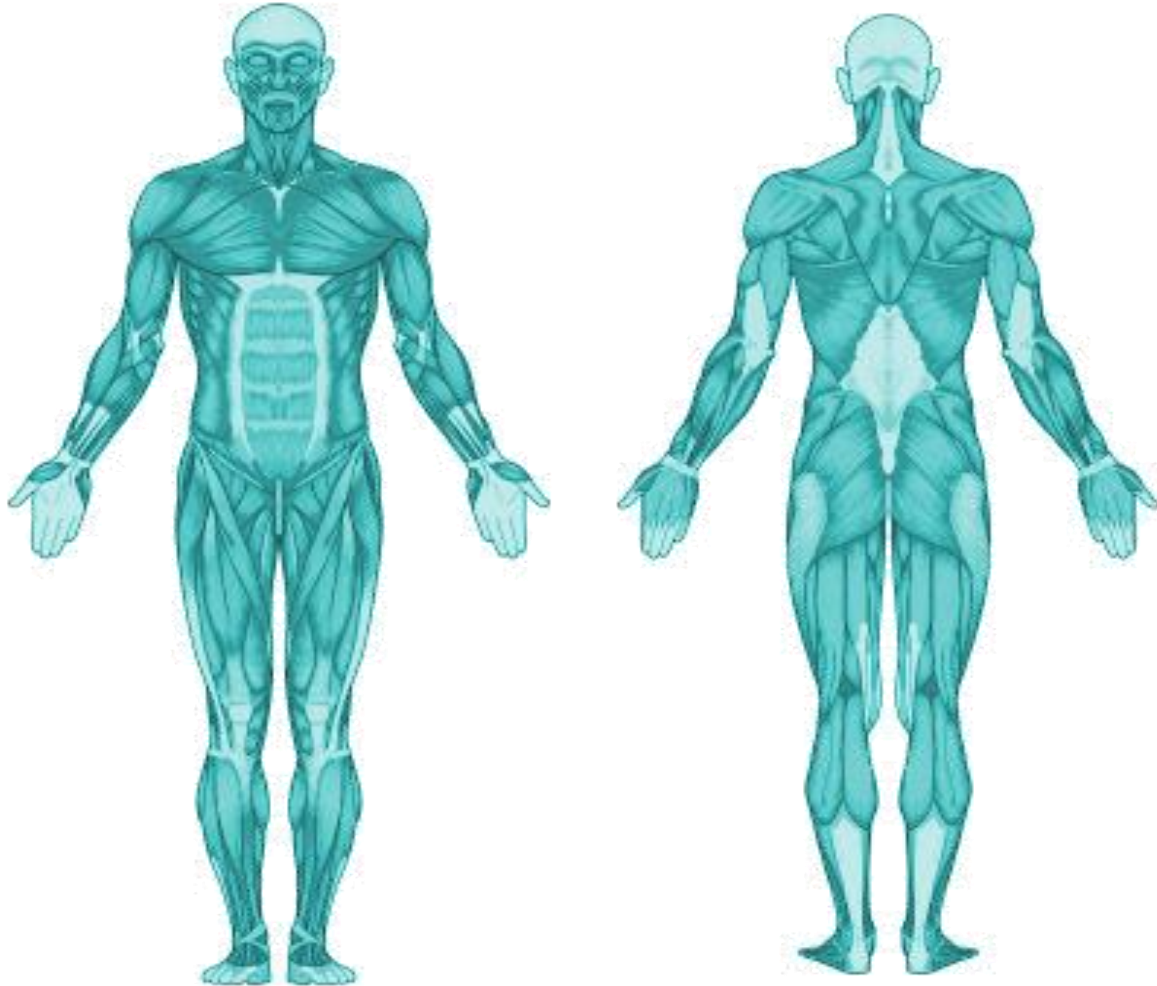
Place the names of the main bones on the skeleton below:

Cranium, ribs, scapula, humerus, radius, ulna, pelvis, femur, patella, tibia, fibula, vertebral column



Place the major muscle groups on the diagrams below

Biceps, triceps, deltoids, pectoralis major, quadriceps, hamstrings, gastrocnemius, trapezius, latissimus dorsi, gluteus maximus



The function of body systems

Cardio-respiratory and vascular system:

- Transport of nutrients and oxygen

.....
.....

- Removal of waste products

.....
.....

- Regulation of body temperature

.....
.....

Cardio-respiratory system:

- Uptake of oxygen through breathing

.....
.....

- Gaseous exchange

.....
.....

- Diffusion

.....
.....

Muscular-skeletal system

Muscles are involved in every movement in the body.

There are 3 types of Muscle Fibres (research each one and make notes)

Voluntary Muscles:

.....
.....

Involuntary Muscles:

.....
.....

Cardiac Muscle:

.....
.....

..... muscles are needed to create movement for exercise and sport.

Muscles in action

Muscles work in P.....

When one muscle Contracts (gets S.....), the other Relaxes (gets L.....). This is called working **ANTAGONISTICALLY**.

The agonist (P..... M.....) is the muscle doing the work. It contracts to pull on the bone.

The antagonist is the muscle that relaxes to let the movement take effect.

Types of movement:

Types of movement	Definition	Sporting example
Flexion		
Extension		
Adduction		
Abduction		
Rotation		
Circumduction		

Energy Systems:

There are 3 types of energy systems, which are used at different stages of exercise.

Complete the table below to understand each one.

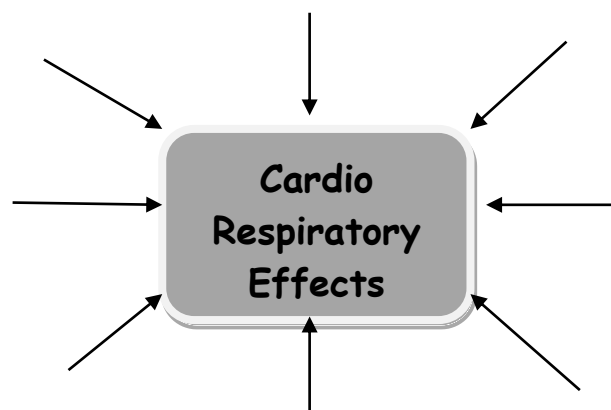
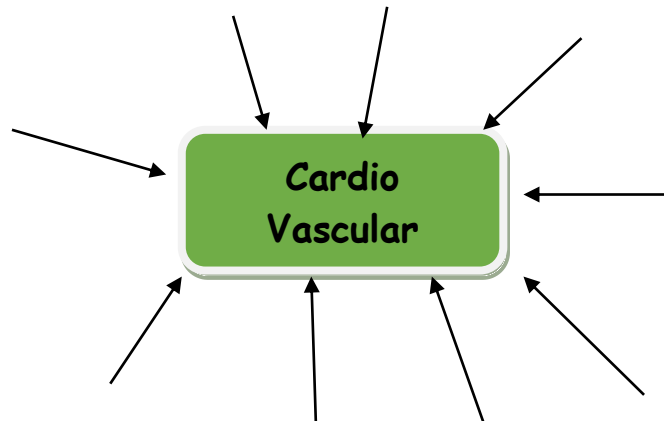
Energy System	Aerobic/ Anaerobic	Fuel/ Energy Source	By- product	Exercise intensity	Duration	Sporting Examples
ATP/ PC						
Lactic Acid						
Aerobic						

The short term and long term effects of exercise on body system

Short term or Immediate effects of exercise:

-
-
-
-
-
-

Long term benefits of exercise:



Muscular/Skeletal Effects:

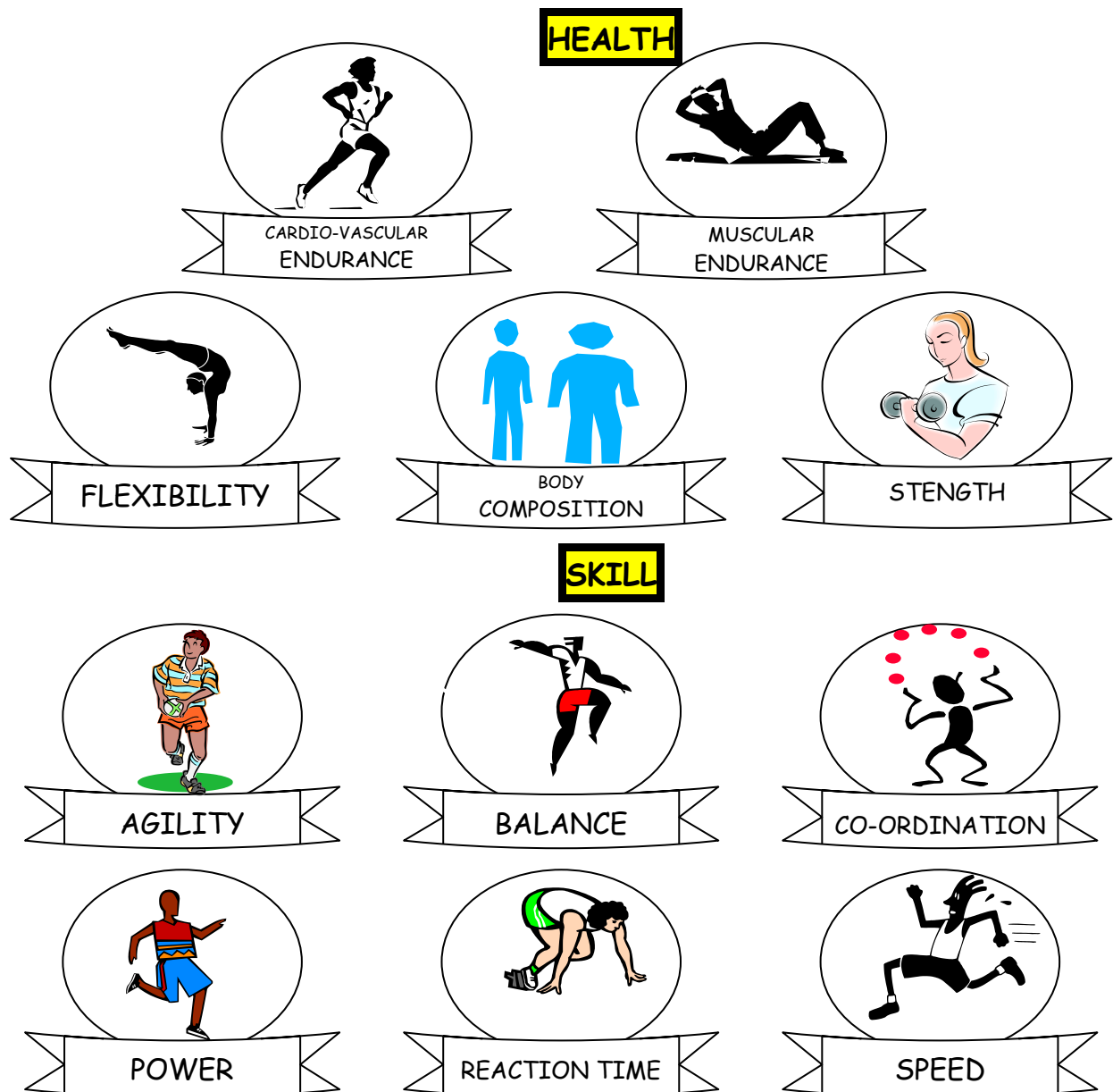
- *
- *
- *
- *
- *
- *

Energy Systems:

- ✓
- ✓
- ✓
- ✓
- ✓
- ✓

2. Understand the importance of the components of fitness for different physical activities

The components of physical fitness are shown below:

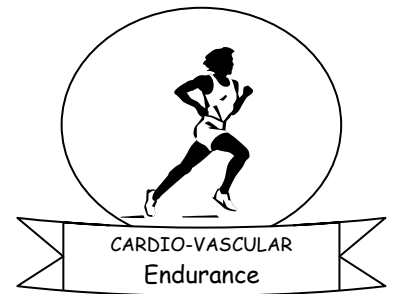


Within this section you will understand the different components of fitness, including:

- their definition
- the fitness test related to each component (along with understanding the importance of the validity and reliability of testing) and
- the sporting activities related to the components.

Cardiovascular Endurance

What is cardiovascular fitness?:



The tests for measuring Cardiovascular endurance are

The Multi Stage Fitness Test and Coopers 12 minute run

Test 1 → The Multi-Stage Fitness Test (Bleep Test)

- This test is maximal & progressive.

Describe the procedure for this test

BEEP TEST MALES	poor	fair	average	good	very good	excellent
12 - 13 yrs	3/4	5/2	6/5	7/6	8/9	10/9
14 - 15 yrs	4/7	6/2	7/5	8/10	9/9	12/2
16 - 17 yrs	5/1	6/9	8/3	9/10	11/4	13/7
18 - 25 yrs	5/2	7/2	8/6	10/2	11/6	13/10
26 - 35 yrs	5/2	6/6	7/10	8/10	10/7	12/9
36 - 45 yrs	3/8	5/4	6/5	7/8	8/10	11/3
46 - 55 yrs	3/6	4/7	5/6	6/7	7/8	9/5
56 - 65 yrs	2/7	3/7	4/9	5/7	6/9	8/4
> 65 yrs	2/2	2/6	3/8	4/9	6/2	7/2

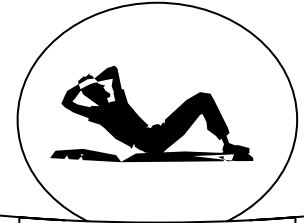
BEEP TEST FEMALES	poor	fair	average	good	very good	excellent
12 - 13 yrs	2/6	3/6	5/2	6/2	7/5	9/3
14 - 15 yrs	3/4	5/3	6/5	7/6	8/8	10/7
16 - 17 yrs	4/2	5/7	7/2	8/5	9/8	11/11
18 - 25 yrs	4/5	5/8	7/3	8/7	10/2	12/7
26 - 35 yrs	3/8	5/3	6/6	7/8	9/5	11/5
36 - 45 yrs	2/7	3/8	5/4	6/3	7/5	9/5
46 - 55 yrs	2/5	3/6	4/5	5/4	6/3	8/1
56 - 65 yrs	2/2	2/7	3/6	4/5	5/7	7/2
> 65 yrs	1/5	2/2	2/7	3/5	4/4	5/7

My Score:.....

How does cardiovascular fitness develop an improved lifestyle and/or performance?

What activities/sports require cardiovascular fitness?

Muscular Endurance



MUSCULAR
ENDURANCE

What is muscular endurance?:

Test → **The 1 minute Abdominal Curl Test**

- This test measures the muscular endurance of the abdominal muscles.

Procedure

- Subject lies on mat, knees at right angles and arms across chest.
- Ankles held by partner or fixed under wall bars
- Complete as many full sit ups in 1 minute.

My Score:.....

Norms for 1 minute sit-up test

Age (yrs)	15 – 19		20 - 29		30 - 39		40 - 49		50 - 59		60 - 69		
	Gender	M	F	M	F	M	F	M	F	M	F	M	F
Excellent	>48	>42	>43	>36	>36	>29	>31	>25	>26	>19	>23	>16	
Above Average	42-47	36-41	37-42	31-35	31-35	24-28	26-30	20-24	22-25	12-18	17-22	12-15	
Average	38-41	32-35	33-36	25-30	27-30	20-23	22-25	15-19	18-21	5-11	12-16	4-11	
Below Average	33-37	27-31	29-32	21-24	22-26	15-19	17-21	7-14	13-17	3-4	7-11	2-3	
Poor	<32	<26	<28	<20	<21	<14	<16	<6	<12	<2	<6	<1	

How does muscular endurance develop an improved lifestyle and/or performance?

What activities/sports require muscular endurance?

Flexibility

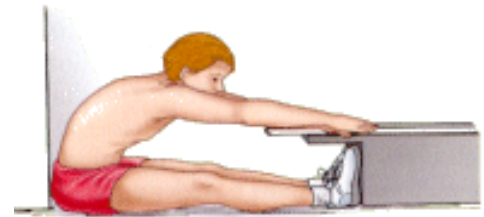


What is flexibility?:

Test → **Sit and Reach Test**

- This measures flexibility at the hip joint, which is generally restricted by the hamstring muscles.

Describe the procedure for this test



My Score:.....

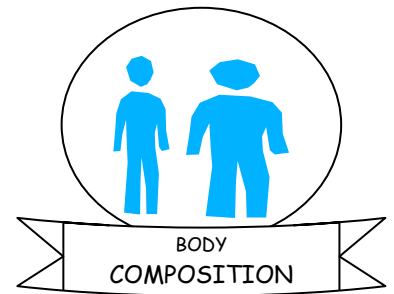
	Excellent	Good	Above Average	Average	Poor	Very Poor
Female (under 25)	23+	22	20-21	17-19	15-16	14 Or below
Male (under 25)	22+	20-21	18-19	14-17	12-13	11 or below

How can you improve your flexibility?

What activites/sports require flexibility?

Body Composition

What is body composition?:



Test → **Skinfold Measurement.**

- The skinfold test is a scientific way of measuring the depth of fat tissue a person has in three places on their body.

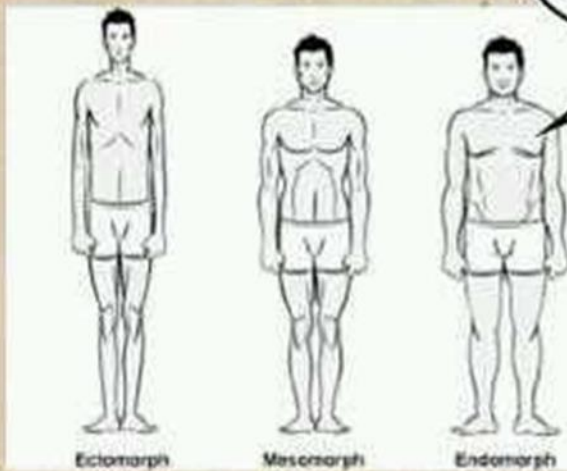
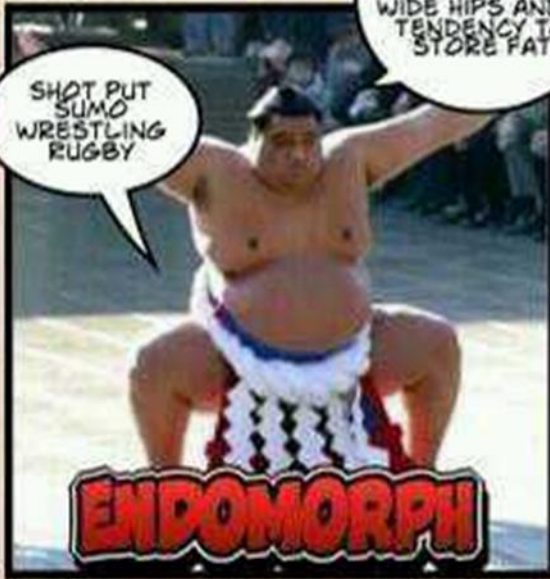
Procedure

- Take a pinch of skin and place the skin fold calipers on the pinched skin.
- Take three measurements at the three locations indicated below.
 - a) Waist (Suprailiac)
 - b) Rear Upper Arm (Tricep)
 - c) Shoulder Blade (Subscapular)
- Add together the three measurements and evaluate your body fatness.

KEY FACTS:

- Male average body fat: 13-16% (obese over 25%)
- Female average body fat: 20-24% (obese over 35%)
- Identifying body type is called somatotyping.
- Somatotyping describes lean body mass (LBM) and total body shape. It measures how round(**Endomorph**), how muscular(**Mesomorph**) and how long you are(**Ectomorph**), in that order. Each is measured on a scale of 1 to 7.
- **SEE NEXT PAGE SHOWING BODY TYPES.**

SOMATOTYPES



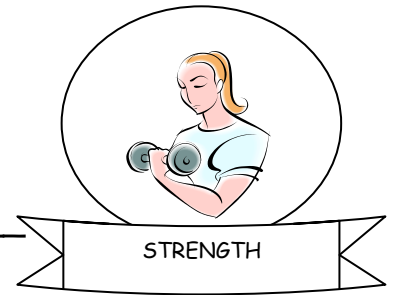
THESE
ARE THE 3
EXTREME
BODY TYPES

SHE IS
A
MESOMORPH
BECAUSE SHE HAS A
SOLID BUILD AND HAS
WIDE SHOULDERS



Strength

What is strength?



Test → 1 Repitition Maximum (1RM)

- This measures your maximum strength (static)

Procedure

- You can use free weights or multigym equipment.
- Find the maximum weight you can lift **once** (1RM) by gradually adding extra weight until you reach the maximum weight you can lift just once.
- You must allow 2/3 minutes between each lift for recovery.

Test → Grip Dynamometer

- Records grip strength using a hand-grip dynamometer



My Score:

Left

hand:

Right

hand:

How can you improve your strength?

Weight Training Terms

Repetition



Set

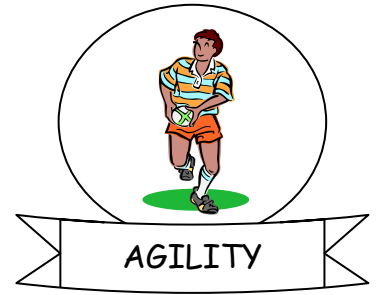
Skill Related Fitness

Skill Related Fitness is the level of fitness necessary for success in a specific sport. If a person has a high level of a skill related fitness component, it is likely that they would be good at sports.

There are 6 components:

Agility

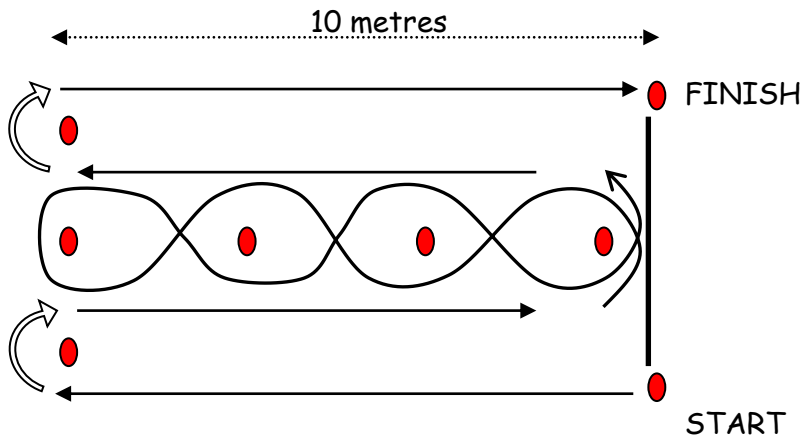
What is agility?:



Test → **Illinois Agility test**

Procedure

- Thorough warm up
- Lie flat down at the start. On the command 'Go', jump up and complete the marked course as quickly as possible.
- The course is set up as shown in the diagram:



- Record the best of two attempts and use a table to determine standard.

My Score:.....

	Excellent	Good	Average	Fair	Poor
Males	Less than 15.2	15.2-16.1	16.2-18.1	18.2-19.3	More than 19.3
Females	Less than 17.0	17.0-17.9	18.0-21.7	21.0-23.0	More than 23.0

(Time in Seconds)

How can you improve your agility:

Balance

"Is the ability to maintain the center of mass of the body above the base of support".

Test → **Stork Stand**

- This is a test of balance

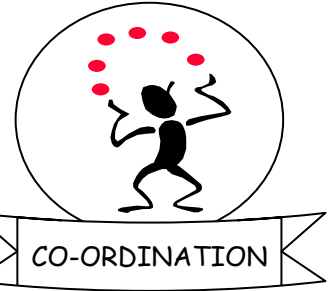


Describe the procedure for this test

My Score:.....

	High score	Above average	Average	Below average	Low score
15 - 16 years	60 - 50	49 - 40	39 - 26	25 - 11	Below 10

Co-ordination



What is co-ordination?:

Test → **Alternate Hand Throw**

Procedure

- Stand two metres from the wall.
- Throw the ball with the right hand and catch it with the left hand.
- Then do the reverse.
- Record the number of successful catches made in 30 seconds.
- You can compare your result with the norms shown in the table below:

My Score:.....

	High score	Above average	Average	Below average	Low score
15 - 16 years	Above 35	35 - 30	29 - 25	24 - 20	Below 20

Number of catches

Why would good co-ordination improve a persons lifestyle or sporting performance?

Power

What is power?:

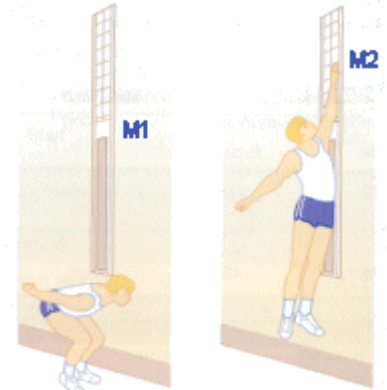


POWER

- Tests** → **Sergeant (vertical) Jump**
 → **Standing Broad Jump (horizontal)**

VJ Procedure

- Measure your stretched height and make a mark.
- Jump as high as possible and make another mark.
- Measure the difference between the two marks.
- You can compare your result with the norms shown in the table below:



	High score	Above average	Average	Below average	Low score
Males 15 - 16 years	Above 65	65 - 56	55 - 50	49 - 40	Less than 40
Females 15 - 16 years	Above 60	60 - 51	50 - 41	40 - 35	Less than 35

Distance in cms

My score: _____

SBJ Procedure

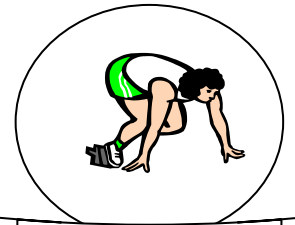
- Stand behind the line.
- Bend your knees and jump (two-footed) as far forward as possible.
- Measure from the line to heel marks.
- You can compare your result with the norms shown in the table below:

	High score	Above average	Average	Below average	Low score
Males 15 - 16 years	2.10 - 2.01	2.00 - 1.86	1.85 - 1.76	1.75 - 1.65	Less than 1.65
Females 15 - 16 years	1.68 - 1.66	1.65 - 1.56	1.55 - 1.46	1.45 - 1.35	Less than 1.35

Distance in metres

My score: _____

Reaction Time



REACTION TIME

What is reaction time?:

Test → The Ruler Drop Test

Procedure

- Rest your hand on the edge of a table, with thumb and forefinger extended.
- Get your partner to hold the ruler at the top.
- The ruler is placed between the open fingers at the 0 cm mark.
- Without warning, the ruler is dropped and you catch it as soon as possible.
- Record the point at which you caught it.

My Score:.....

Excellent	Above average	Average	Below average	Poor
Less than 7.5cm	7.5-15.9cm	15.9-20.4cm	20.4-28cm	More than 28.0cm

How can reaction time improve a sports performers performance?

Speed



SPEED

What is speed?:

Test → 30-metre Sprint

Procedure

- On a 30m 'marked out' running surface, using a flying start, sprint as fast as possible between the marked lines.
- The sprint must be accurately measured from the start to the finish line.
- Record the time and use the table to determine your rating.

	High score	Above average	Average	Below average	Low score
Males 15 - 16 years	Less than 4.0	4.2 - 4.0	4.4 - 4.3	4.6 - 4.5	More than 4.6
Females 15 - 16 years	Less than 4.5	4.6 - 4.5	4.8 - 4.7	5.0 - 4.9	More than 5.0

Time in seconds

My score: _____

For our bodies to achieve speed, energy has to be supplied to the muscles very quickly. Muscles then have to contract in the shortest possible time. We will use our **anaerobic energy** supply system for speed work.

How can you improve your speed?:

Administrating & Validity of testing

When administering any physical fitness test, it is essential that all candidates are given the opportunity to achieve their best possible score.

It is important that all tests are carried out as **fairly as possible**, so the results are **both reliable and valid**.

Reliability

Can you rely on the test results - if the test was repeated it will give the same results (consistent).

Have the procedure of the test been followed properly, and could the test results be compared with other results fairly.

Validity

The validity of a test means how well does the test measure exactly what it is meant to measure. This is important because a person may achieve a high score on a certain fitness test, but may actually have a weakness in this area, if a test doesn't have good validity.

e.g A good score in the 'sit & reach' test because the person has long arms and short legs, but the person has poor amount of flexibility at the hip joint.

The results from any standard fitness tests can be used to compare fitness levels within a group of individuals or a team, amongst people of similar ages and sports or used to compare the fitness levels of people in different sports.

Why is fitness testing important?

Discuss the following reasons for testing:

- Important information for the coach

.....
.....
.....

- Team selection

.....
.....
.....

- Strengths and Weaknesses

.....
.....
.....

- Goal setting/target setting

.....
.....
.....

- Baseline

.....
.....
.....

- Comparison against normative data

.....
.....
.....

PAST PAPER TYPE QUESTIONS

1) Name a cardiovascular fitness test.

[1]

2) Give three reasons why you think it is important to test the fitness level of a sports player at regular intervals. [3]

3) Give two reasons to explain why it is important to follow correct procedures when carrying out physical fitness tests. [2]

4) Name and describe a test that measures flexibility. [4]

5) Name one of the fitness components needed for a 100 metre race, and describe a recognised fitness test for this component. [4]

6) (i) Name a skill-related physical fitness component.

[1]

(ii) Name a **recognised** test for your chosen skill-related physical fitness component. [1]

7) For any physical fitness test to be recognised it needs to be **both** reliable and valid. Explain what **each** term means. [2]

Reliable _____

Valid _____

8) In the table below name one recognised physical fitness for each of the named physical fitness components. [4]

PHYSICAL FITNESS COMPONENT	NAME OF TEST
Flexibility	
Muscular endurance	
Cardiovascular Endurance	
Agility	

9) (i) Name a health-related physical fitness component. [1]

(ii) Describe the correct procedure for carrying out **one recognised** test for the component named. [2]

Name of test _____

Description of test _____

(iii) In a named sporting activity explain how the health-related physical fitness component named in part (i) can help to improve performance. [2]

Name of sporting activity _____

Explanation _____

Total: /27

Teacher Comment:

Pupil Target:

3. Understand the role of training in achieving improvements in fitness

Principles of Training

We need to train to improve our fitness. For steady progress and to avoid injury we should follow the **SPOV** principles:

Specificity

Progression

Overload

Variance

Write down what each Principle of Training means:

Specificity	
Progression	
Overload (intensity, frequency, duration)	
Variance	

Methods of Training

Task:

Using the books provided, describe what each of the Methods of Training are. List what components of fitness they help improve, along with the advantages and disadvantages of each method.

Continuous:

.....
.....
.....
.....

Interval:

.....
.....
.....
.....

Fartlek:

.....
.....
.....
.....

Circuit:

.....
.....
.....
.....

Weight Training:

.....
.....
.....
.....

Plyometrics:

.....

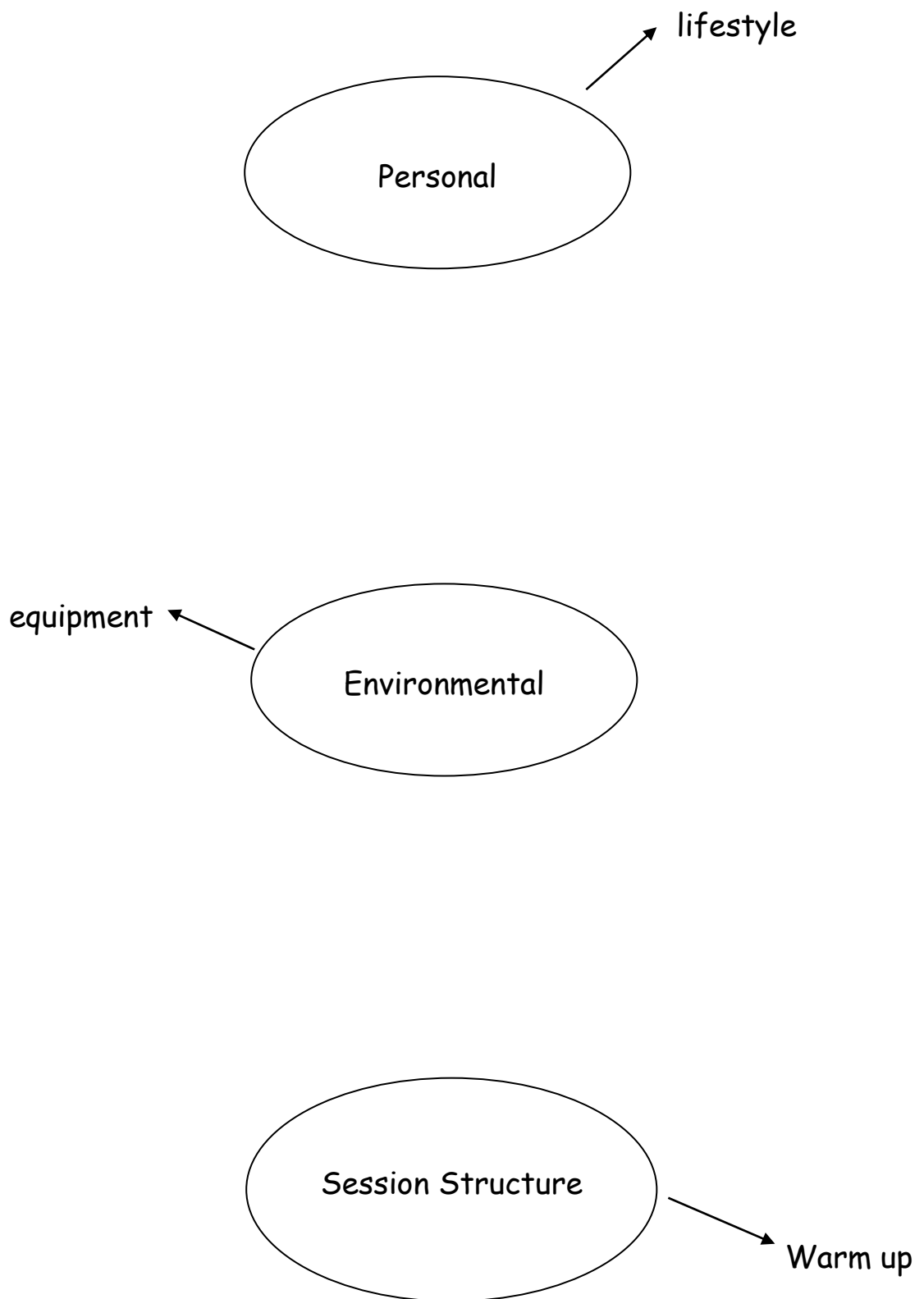
.....

.....

.....

The factors that need to be considered for training

What factors need to be considered for training? (an example has been given)



4. Be able to plan fitness training programme

Set appropriate targets to achieve long term goals for an individual

Goal Setting

Goal setting helps to...

- motivate
-
-
-
-
-

Smart targets should be used to support goal setting

SMART	Definition
Specific	
Measurable	
Achievable	
Realistic	
Timely	

Task:

Using SMART, choose a goal and list how you will achieve it.

Goal:.....

S	
M	
A	
R	
T	

Sequence training programme activities