

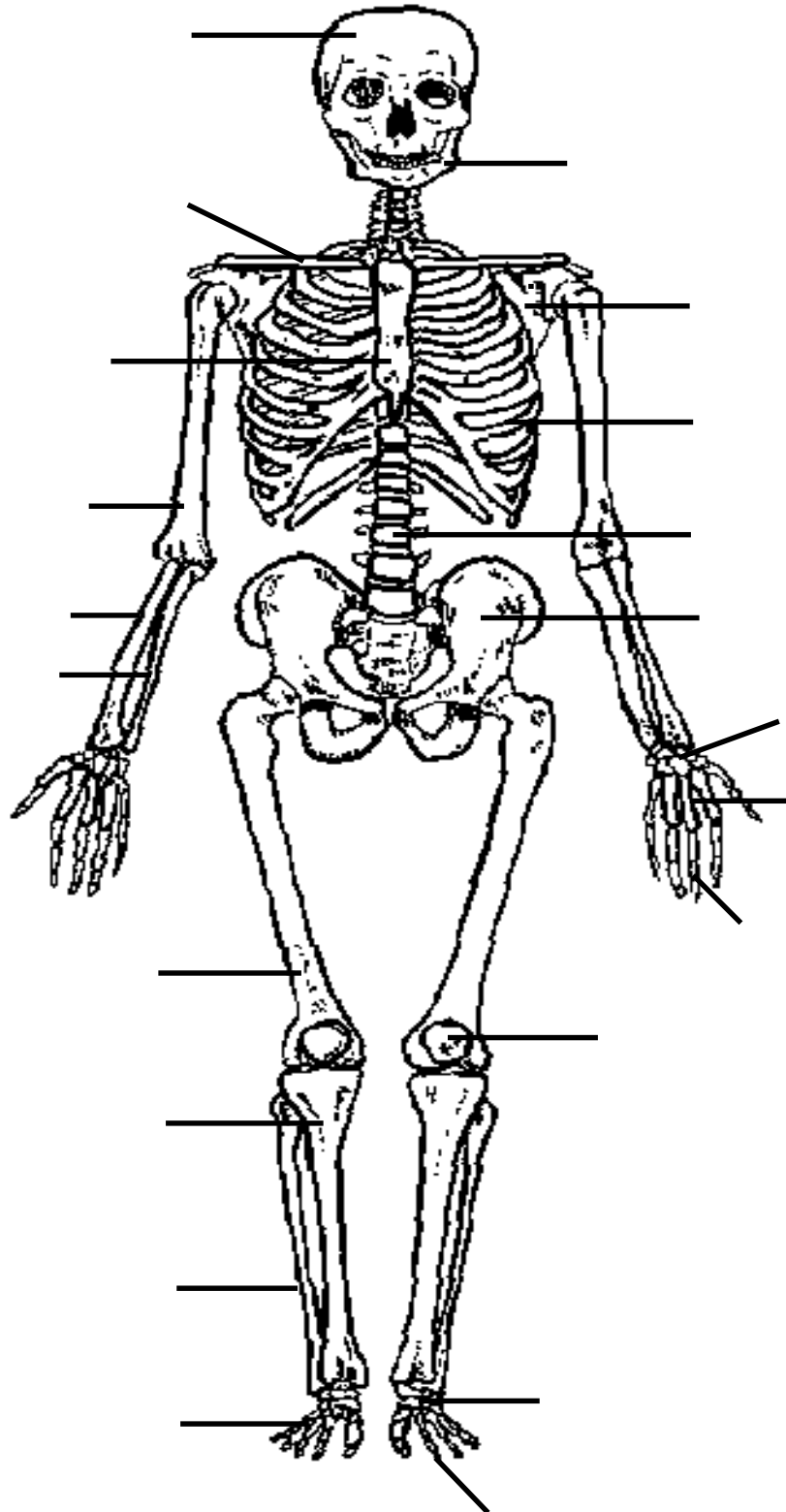
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The Masters are intended as an aid to teachers and are not a definitive course outline or summary. They represent the authors' interpretation and approach and are not endorsed by any governing body. They provide the individual teacher with the opportunity to mould them to suit their circumstances and thereby satisfy themselves that they have adequately met the requirements of their courses.

Any similarities to existing worksheets are coincidental.

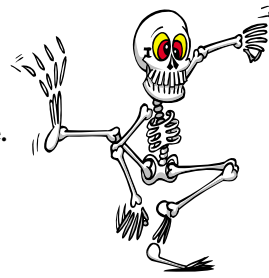
Label the diagram of the skeleton below :





Investigate the factors that contribute to healthy bone growth by preparing a report along the following lines :

1. If your parents have kept records of your growth patterns as a baby / infant / child, tabulate your height at the various ages recorded.
2. Record your present height.
3. List and discuss each of the factors that were, and are still, critical to your bone growth and development.
4. List the activities you participated in as a child and discuss the adequacy of these for the healthy growth and development of your bones.
5. List the activities you currently participate in and discuss the adequacy of these for the growth and maintenance of healthy bones.
6. List any bone and/or joint injuries you have received.
Discuss how each of these occurred and was treated and explain the impact each may have had on your bone growth and development.
7. Discuss the dietary considerations that are important for healthy bone growth.
8. Does your diet consist of enough of each of these ?
If not, how should your diet be modified ?
9. What is *osteoporosis*, who does it mostly affect, and how can it be avoided ?
10. With reference to your activity patterns and diet, discuss the extent to which your current lifestyle contributes to healthy bone growth and development.

the articular system

The body's joints or articular system allows movement to take place. When a muscle contracts across a joint, movement will be created allowing us to exercise and perform activities in our every day lives.

1. Define the following types of joint :
 - (a) Fibrous
 - (b) Cartilaginous
 - (c) Synovial

2. Give two examples of the following types of joint :
 - (a) Fibrous
 - (b) Cartilaginous
 - (c) Synovial

3. List the categories of synovial joint.

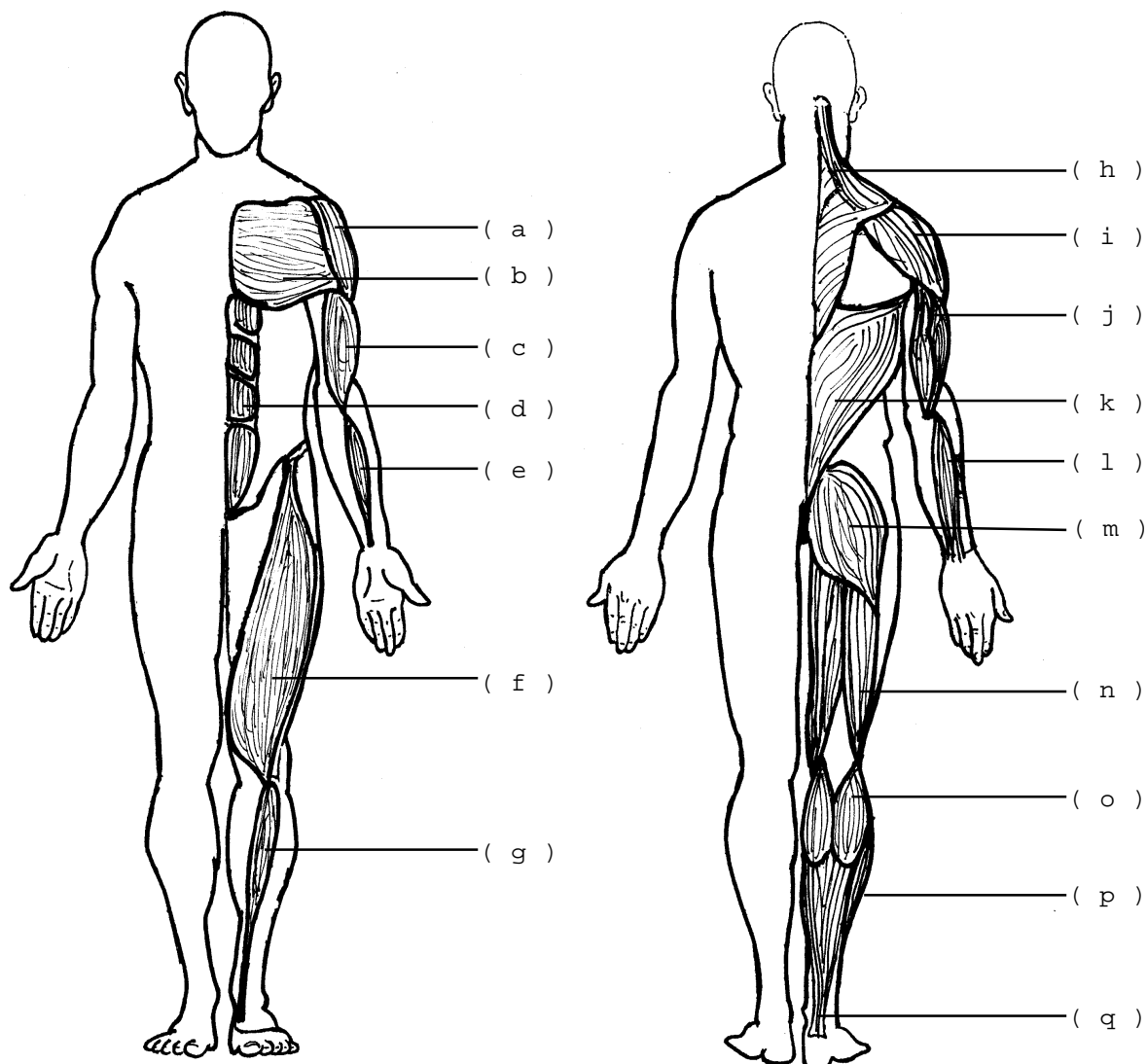
4. Explain the function of each of these features of a synovial joint :
 - (a) Joint capsule
 - (b) Articular cartilage
 - (c) Synovial membrane
 - (d) Synovial fluid
 - (e) Ligament

5. Draw and label a diagram of a synovial joint, including each of the features listed in Q3 above.

6. Define the following types of movement performed by synovial joints :
 - (a) Flexion
 - (b) Extension
 - (c) Abduction
 - (d) Adduction
 - (e) Rotation
 - (f) Circumduction
 - (g) Supination
 - (h) Pronation
 - (i) Plantar flexion
 - (j) Dorsi flexion
 - (k) Inversion
 - (l) Eversion

7. For the joints listed below, name their category (fibrous, cartilaginous, synovial) and the movements permitted. If the joint is a synovial joint, list which type of synovial joint.
 - (a) Shoulder
 - (b) Elbow
 - (c) Wrist
 - (d) Hip
 - (e) Knee
 - (f) Ankle
 - (g) Atlas & Axis
 - (h) Thumb
 - (i) Skull
 - (j) Vertebra

Label the diagrams of the muscular system below :



(a) _____ (b) _____ (c) _____
 (d) _____ (e) _____ (f) _____
 (g) _____ (h) _____ (i) _____
 (j) _____ (k) _____ (l) _____
 (m) _____ (n) _____ (o) _____
 (p) _____ (q) _____

Using magazines, newspapers, the internet, etc. collect three pictures of athletes performing physical activity.

Paste them below.

(If there is not enough space attach them on seperate pages)

Highlight on the pictures:

- the names of the major muscles being used.
- the type of contraction each muscle is demonstrating.
- the type of muscle fibre needed for best performance of this action.

Our muscles consist of two main types of muscle fibre (slow twitch fibres and fast twitch fibres) with a major determinant of muscle fibre proportions being genetics.

The proportion of slow and fast twitch fibres will vary between individuals and will even vary from one muscle group to another in the same individual.

An athlete's muscle fibre make up will determine their suitability to certain types of events or sports.



MARATHON



100 M. SPRINT

1. List the main characteristics of slow twitch fibres.

2. List the main characteristics of fast twitch fibres.

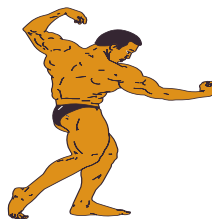
3. List some sports or events that are best suited to athletes with a higher proportion of slow twitch fibres.

4. List some sports or events that are best suited to athletes with a higher proportion of fast twitch fibres.

EXTENSION ACTIVITY :

Circle the correct responses in the table below to further highlight the differences between slow and fast twitch fibres.

CHARACTERISTIC	SLOW TWITCH FIBRES	FAST TWITCH FIBRES
COLOUR	RED / WHITE	RED / WHITE
FIBRE SIZE	LARGE / SMALL	LARGE / SMALL
SPEED OF CONTRACTION	FAST / SLOW	FAST / SLOW
FORCE PRODUCED	LOW / HIGH	LOW / HIGH
RESISTANCE TO FATIGUE	LOW / HIGH	LOW / HIGH
ABILITY TO USE OXYGEN	LOW / HIGH	LOW / HIGH
CAPILLARY DENSITY	LOW / HIGH	LOW / HIGH

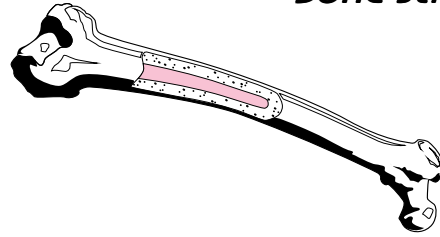


1. Complete the table below stating the **SITE** and **ACTION** of each muscle listed :

MUSCLE	SITE	ACTION
BICEPS		
TRICEPS		
PECTORALS		
DELTOIDS		
LATISSIMUS DORSI		
TRAPEZIUS		
ABDOMINALS		
ERECTOR SPINAE		
GLUTEALS		
HAMSTRINGS		
QUADRICEPS		
TIBIALIS ANTERIOR		
GASTROCNEMIUS		
SOLEUS		

2. Complete the table below to indicate the **MAJOR MUSCLES** used in the following activities :

ACTION	MAJOR MUSCLE(S) USED
KICKING A BALL	
CLIMBING STAIRS	
VERTICAL JUMP	
CHIN UPS	
BENCH PRESS	
SIT UPS	
SHOT PUT	
BARBELL CURL	

**Introduction :**

The 206 bones of the human body articulate to form the skeleton.

The main functions of the skeleton are *support, protection, movement, blood cell formation, and the store of minerals.*

The axial skeleton consists of the skull, spine and thorax, whilst the *appendicular* skeleton consists of the pelvic and shoulder girdles and the limbs.

Bones can also be classified due to their shape : *long, short, flat, and irregular.*

Aim : To analyse the structure of a *long bone*.

Equipment :

A *long bone* that the butcher has sectioned *longitudinally* (cut in half longways).

Procedure :

1. Carefully examine the structure of the long bone and analyse the following parts:
 - (a) Shaft
 - (b) Head
 - (c) Marrow (medullary) cavity
 - (d) Bone marrow
 - (e) Compact bone
 - (f) Cancellous bone

Discussion :

1. Draw a *diagram* of the bone and label on it the structures (a) to (f) above.
2. Describe the appearance and texture of the *compact bone*.
3. Describe the appearance and texture of the *cancellous bone*.
4. (a) Describe the appearance of the *bone marrow* in the *cancellous bone*.
(b) What is its function ?
5. (a) Describe the appearance of the *bone marrow* in the *medullary cavity*.
(b) What is its function ?

Conclusion :

Summarise your observations in order to explain the function and major structural features of a *long bone*.

**Introduction :**

Articulations occur when two or more bones join together.

Muscles are connected to bones and when they contract across a joint, movement occurs.

Joints can be classified as follows :

Fibrous joints - bones are fused together by fibrous tissue and NO movement is possible.

Cartilagenous joints - bones are joined by cartilage and SLIGHT movement is possible.

Synovial joints - features include: joint capsule, hyaline cartilage, synovial membrane, synovial fluid, ligaments, etc. and FREE movement is possible.

Aim : To analyse the structure of a *Synovial joint*.

Equipment : Hock Scalpel Scissors Cutting board

Procedure :

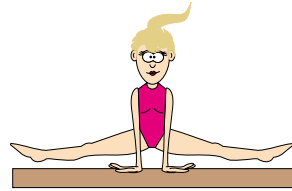
1. Examine the *hock joint* and try to move it.
What structures do you think limit its movement ?
2. Begin dissecting the hock and tick the following structures as you locate them.

skin	<input type="checkbox"/>	muscles	<input type="checkbox"/>	tendons	<input type="checkbox"/>	ligaments	<input type="checkbox"/>
bone	<input type="checkbox"/>	capsule	<input type="checkbox"/>	synovial fluid	<input type="checkbox"/>	cartilage	<input type="checkbox"/>

3. Describe the appearance and texture of each of the structures in Question 2.
4. Explain the function of each of the structures in Question 2.
5. Once dissected, try to move the hock joint.
Does it move more freely than before ? Why / why not ?

Conclusion :

Compare the *hock joint* to the *ankle joint* of the human skeleton. How do the structures examined aid *mobility*, *support*, and *strength* when you participate in physical activity ?



Introduction :

Flexibility is the range of motion about a joint and has important implications for sports performance and injury prevention.

There are two types of flexibility:

Static flexibility is the ability to move a joint through a large range of motion (eg: seated toe touch), whilst *Dynamic flexibility* involves moving with ease, speed, and without resistance or stiffness (eg: bowling a cricket ball).

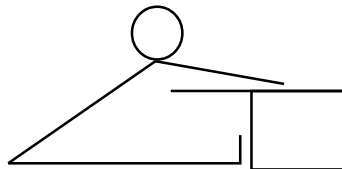
Factors that affect flexibility include: joint structure, muscle and ligament lengths, body build and percentage body fat, muscle temperature, skin, age, sex, etc.

Aim : To investigate the range of motion of selected joints.

Equipment : Sit and reach box metre rulers dressmaker's measuring tapes

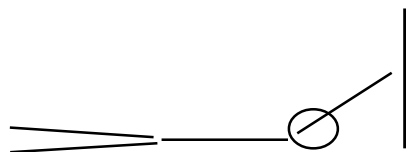
Procedure : Obtain flexibility ratings using the following tests:

Sit and reach: Sit at the sit and reach box with legs extended and the bottom of the feet against the box. With one hand on top of the other, slide your fingers along the ruler and measure the final score in centimetres.



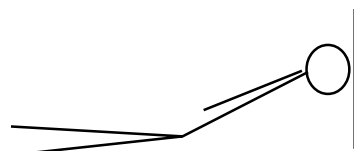
Shoulder and wrist elevation test:

Lie prone on the floor and with arms stretched forward, grasp a ruler with the hands at shoulder width. Keeping your chin on the floor, raise the ruler as high as possible and read the distance (in cm) from the floor using another ruler held vertically by another student. Measure your arm length from finger tips to acromion process. Subtract your best score from your arm length.



Trunk and neck extension test:

Lie prone on the floor with your hands clenched behind your back. Keeping your hips on the floor, raise your body as high as possible. Measure where your nose touches the ruler held vertically by another student. Now measure the distance from your nose to the seat of a chair whilst seated (ie: your trunk and neck length). Subtract your best score from your trunk and neck length.



Results :

Test	Your Score	Male Average	Female Average	Diff between your score & same sex average (+ / -)
Sit and Reach				
Shoulder and Wrist elevation				
Trunk and Neck extension				

Discussion :

1. Discuss the degree to which you are above or below the same sex average for each test and suggest possible reasons why.
2. Are the female averages above the male averages ? Why / why not ?
3. Name two sports that require each of the types of flexibility tested.
4. Explain a flexibility exercise that could be performed on a regular basis to improve each of the types of flexibility tested.

Conclusion :

With specific reference to your results, discuss the statement that :

"flexibility is specific to certain joints rather than general to all body parts".



**Introduction :**

Strength can be defined as the force a muscle or group of muscles can exert in a single maximal contraction.

The amount of strength which can be applied by an individual is influenced by a number of factors including: the cross sectional area of a muscle, muscle length and joint angle, muscle fibre types, age, sex, muscle fibre arrangement, and speed of contraction.

Aim :

To determine the relationship between *cross sectional area* of a muscle and the *force* that muscle can exert.

Equipment : Tape measure Hand dynamometer

Procedure :

1. Measure the girth of the forearm around the thickest point between the elbow and the wrist for the dominant and non-dominant hand for each subject.
2. Using the hand dynamometer, perform a maximum grip strength test for the dominant and non-dominant hands.

Results :**Individual results:**

Subject	DOMINANT HAND		NON-DOMINANT HAND	
	Girth (cm)	Max Grip (kg)	Girth (cm)	Max Grip (kg)
1.				
2.				
3.				
4.				

Class averages:

Subject	DOMINANT HAND		NON-DOMINANT HAND	
	Girth (cm)	Max Grip (kg)	Girth (cm)	Max Grip (kg)
Male average				
Female average				
Class average				

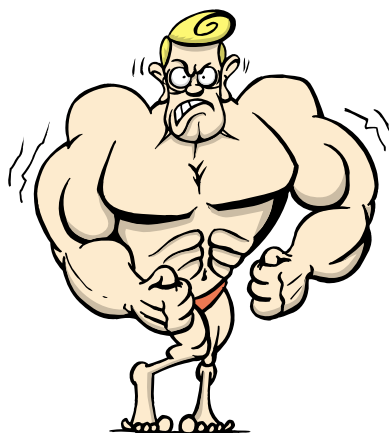
Discussion :

1. Plot a line graph of forearm circumference vs force for each subject in your group.
Plot a line for dominant hand and a line for non-dominant hand.
2. Draw a bar graph to highlight the male, female, and class averages for dominant and non-dominant hands.
3. Discuss the relationship between cross sectional muscle area and force exerted shown by your results.
Refer to specific data to support your discussion.
4. Compare the results between male and female subjects.
Discuss the influence gender has on cross sectional development of muscle.
5. Explain why measuring the circumference of the forearm is not the most accurate measure of the cross sectional area of a muscle.
Did this have any influence on your results ? Discuss with specific reference to your results.
6. Would you expect the subjects who scored highly on the grip strength test to have a greater percentage of fast or slow twitch fibres in the forearm and why ?
7. (a) Compare the scores gained by individuals for dominant and non-dominant hands.
Explain the observed difference in relation to the tendency for individuals to perform activities using preferred hands.

(b) Give an example of an athlete who would have a large variation in the force they can exert between dominant and non-dominant hands.

Conclusion :

1. Based on your results, discuss the body shape and size best suited to sports requiring *strength*.
2. Discuss methods by which muscle size can be increased to improve sports performance.



Introduction :

Muscular strength can be defined as the force a muscle or group of muscles can exert in a maximal contraction.

eg: performing a maximal bench press.

Muscular endurance is defined as the ability of a muscle to contract over long periods at sub-maximal workloads.

eg: performing a number of push ups.

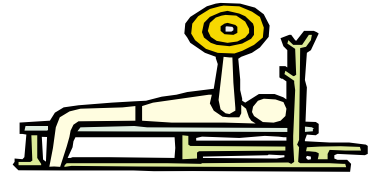
Performance in each component is determined by a number of factors including: muscle fibre type, muscle hypertrophy, age, gender, etc.

Aim : To investigate whether there is a direct correlation between strength and local muscular endurance.

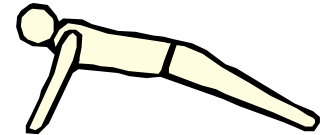
Equipment : Weights bench Selected free weights.

Procedure :

Part 1. Complete one maximal bench press and record your best weight lifted.



Part 2. Complete the maximum number of push ups before exhaustion.



Results :

Test	Subject 1	Subject 2	Subject 3	Subject 4	Average
Max Bench Press (kg)					
Max number of Push Ups					

Discussion :

1. Compare the results gained on the strength and endurance tests by plotting a graph of the results for each subject *and* the averages.
2. Based on your results, did there appear to be a relationship between strength and endurance ?
Ie: Did people who scored high on muscular strength also score well on muscular endurance ? Why / why not ?
3. Which type of muscle fibres would be predominate in individuals who scored well on the strength test.
Outline the physiological features of these muscle fibres which make them suited to strength activities.
4. Which type of muscle fibres would predominate in individuals who scored well on the endurance test.
Outline the physiological features of these muscle fibres which make them suited to endurance activities.
5. Give two sporting examples of activities / movements which rely on muscular strength.
Give two sporting examples of activities / movements which rely on muscular endurance.

Conclusion :

With specific reference to your results, discuss how you would go about training for :

- (a) a sport requiring muscular strength.
- (b) a sport requiring local muscular endurance.

The skeletal system plays a major role in the performance of physical skills.

The interplay between the bones and their joints and the effect of muscles acting on the skeleton allows movement to take place.

Participate in a game of *VOLLEYBALL* to investigate the relationship between the *skeletal system* and physical activity.

Analyse *bones, joint types and classifications, movement, and possible skeletal injuries* as they apply to the sport of *volleyball*.

Introduction :

1. List the major functions of the skeleton.

2. Name the three different *types* of joint and explain the main features of each.

(i) _____

(ii) _____

(iii) _____

3. Name the five types of *synovial* joint.

(i) _____ (ii) _____

(iii) _____ (iv) _____

(v) _____

4. Explain the main functions of each of these features of a *synovial* joint :

(i) Joint capsule : _____

(ii) Hyaline cartilage : _____

(iii) Synovial membrane: _____

(iv) Synovial fluid: _____

(v) Ligaments: _____

Discussion :

1. Analyse the *skeletal system* and the *volleyball skills* performed and complete these tables:

skill	joint	bones articulating	types of bone	joint classification	movement
serve (underarm)	shoulder				
	elbow				
	wrist				
	hips				
	knees				
	ankles				

skill	joint	movement	skill	joint	movement
set	shoulder		spike	shoulder	
	elbow			elbow	
	wrist			wrist	
	hips			hips	
	knees			knees	
	ankles			ankles	

2. With reference to the game of *volleyball*, explain how the skeletal system provided :

(i) SUPPORT _____

(ii) PROTECTION _____

(iii) MOVEMENT _____

3. How can your participation in the sport of volleyball help maintain healthy bones & joints ?

4. Name a possible *bone injury* that may occur from participation in volleyball and explain how the bone is damaged by this injury.

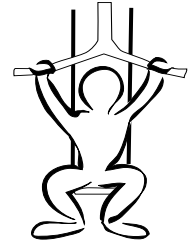
5. Name a possible *joint injury* that may occur from participation in volleyball and explain how the joint is damaged by this injury.

The body has over 600 muscles which provide vital bodily functions, maintain posture, and permit movement.

The brain sends signals to *skeletal* or *voluntary* muscles and when they contract across joints movement takes place.

These muscular contractions when performed in a controlled manner allow us to perform physical activities.

Participate in a *Weight training session* to investigate the relationship between the *muscular system* and physical activity.



Introduction :

1. Briefly explain the basic principles of weight training.

2. Define each of the following types of muscle contraction.

Isotonic - concentric: _____

Isotonic - eccentric: _____

Isometric: _____

Isokinetic: _____

3. Explain the difference between muscular *strength* and muscular *endurance*.

4. Explain the process of *reciprocal inhibition* as it applies to weight training.

Discussion :

1. How did your muscles feel whilst you performed the weight training exercises and why ?

2. How did your muscles feel the next day and why ?

3. Why might one person be able to lift heavier weights than another person of the same sex ?

4. Why might the boys in the class be able to exercise with heavier weights than the girls ?

5. How did *your* level of muscular strength affect your participation in this practical activity ?

6. How did *your* level of muscular endurance affect your participation in this activity ?

7. How could a weight training program be structured to improve :

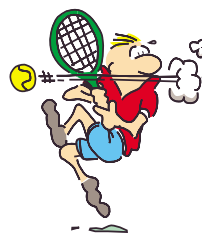
(a) Muscular strength: _____

(b) Muscular endurance: _____

8. For each of the exercises performed, complete the following table:

Exercise	Muscle	Origin	Insertion	Movement	Joint

9. Explain how weight training could be of benefit to you in your favourite sport.



Observe a game of any racquet sport on video.
(examples include: tennis, badminton, table tennis, squash, etc.)

Investigate the *movements* demonstrated by the players in their stroke play and name the movements carried out at each of the *joints* listed.

skill	joint	movement
serve	shoulder	
	elbow	
	wrist	
	hips	
	knees	
	ankles	

skill	joint	movement
topspin forehand	shoulder	
	elbow	
	wrist	
	hips	
	knees	
	ankles	

skill	joint	movement
slice forehand	shoulder	
	elbow	
	wrist	
	hips	
	knees	
	ankles	

skill	joint	movement
topspin backhand	shoulder	
	elbow	
	wrist	
	hips	
	knees	
	ankles	

skill	joint	movement
slice backhand	shoulder	
	elbow	
	wrist	
	hips	
	knees	
	ankles	

skill	joint	movement
forehand smash	shoulder	
	elbow	
	wrist	
	hips	
	knees	
	ankles	

skill	joint	movement
backhand lob	shoulder	
	elbow	
	wrist	
	hips	
	knees	
	ankles	



Observe a video of a competitive game of sport at the elite level.

For five skills investigate: the muscles used.
 the movements performed.
 the type of muscular contraction required.
 the type of muscle fibre used.

SPORT : _____

Skill	muscle(s)	movement(s)	contraction(s)	fibre type

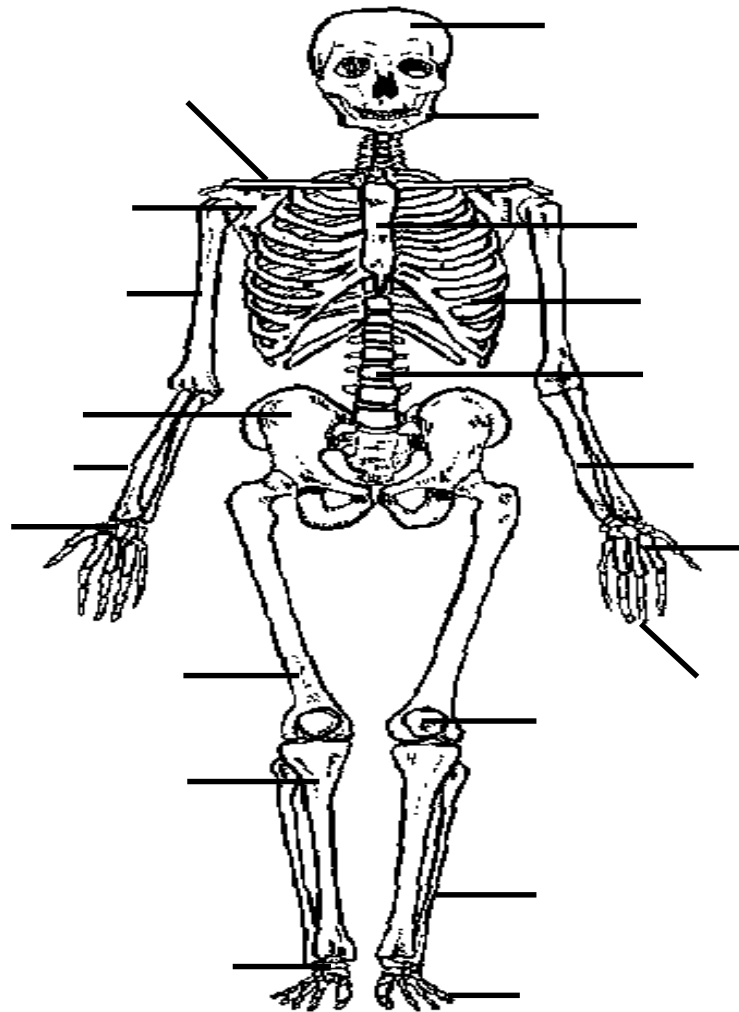
Skill	muscle(s)	movement(s)	contraction(s)	fibre type

Skill	muscle(s)	movement(s)	contraction(s)	fibre type

Skill	muscle(s)	movement(s)	contraction(s)	fibre type

Skill	muscle(s)	movement(s)	contraction(s)	fibre type

1. Label the diagram of the skeleton below:



2. List four functions of the skeleton.

- (i) _____ (ii) _____
(iii) _____ (iv) _____

3. How many vertebrae are in each section of the spine ?

Cervical _____ Thoracic _____ Lumbar _____ Sacrum _____ Coccyx _____

4. Name and give an example of four different types of bone.

- (i) _____
(ii) _____
(iii) _____
(iv) _____

5. What is an *epiphyseal plate* and explain how it functions.

6. List three factors that affect bone growth.

(i) _____ (ii) _____ (iii) _____

7. Name and define the three different types of joint.

(i) _____

(ii) _____

(iii) _____

8. Explain the function of each of these features of a *synovial joint*:

Hyaline cartilage: _____

Joint capsule: _____

Synovial membrane: _____

Synovial fluid: _____

Ligaments: _____

9. Name and give an example of four different types of synovial joint.

(i) _____

(ii) _____

(iii) _____

(iv) _____

10. Define the following movements:

Flexion: _____

Extension: _____

Abduction: _____

Adduction: _____

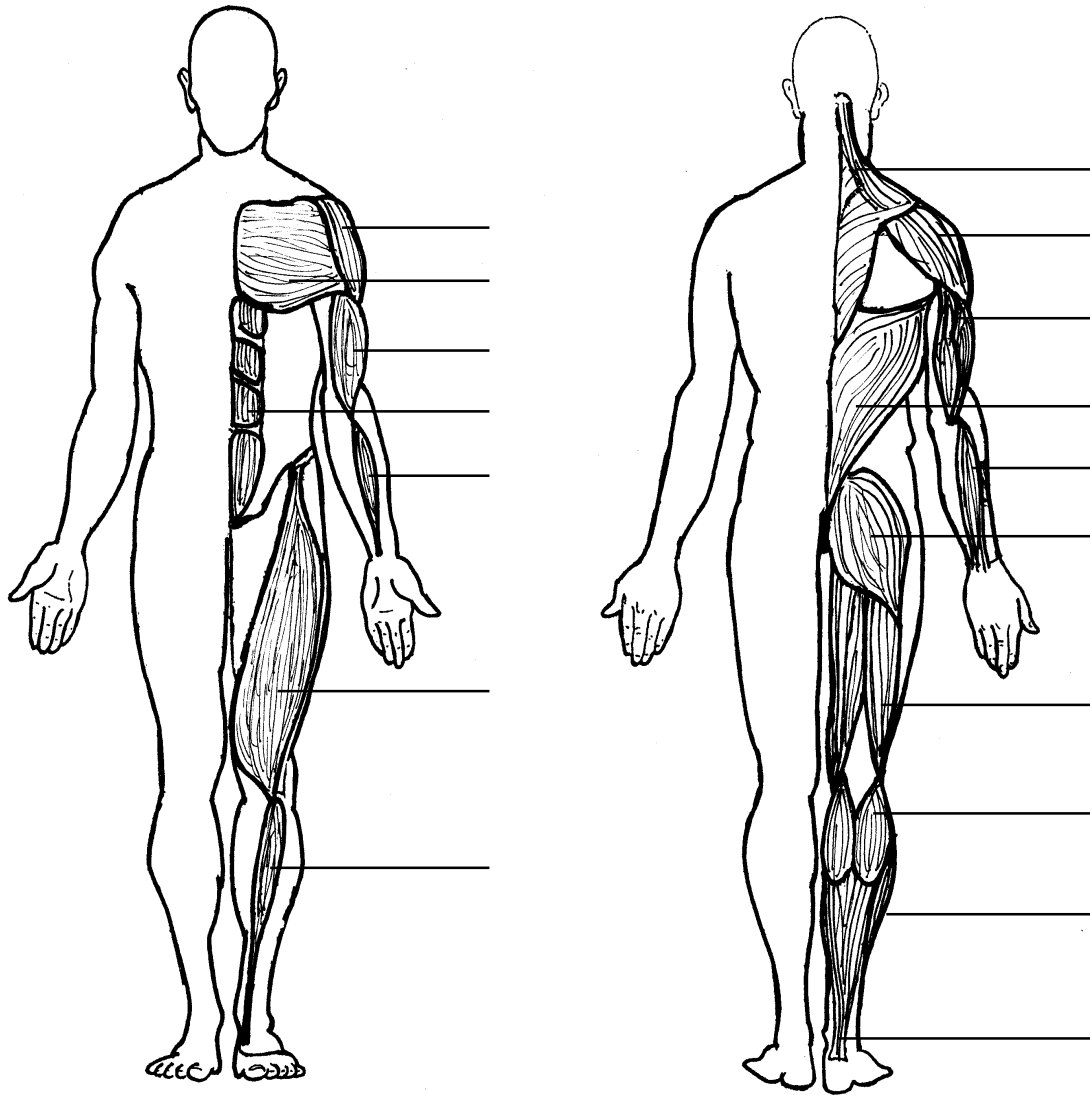
Rotation: _____

Pronation: _____

Inversion: _____

Plantar flexion: _____

1. Label the diagram of the muscular system below:



2. Name and state the function of the three different types of muscle.

- (i) _____

- (ii) _____

- (iii) _____

3. Define and give an example of each of the following types of contraction.

Isotonic - concentric: _____

Isotonic - eccentric: _____

Isometric: _____

Isokinetic: _____

4. Name and define the two different types of muscle fibre.

(i) _____

(ii) _____

5. Define the following:

Neuron: _____

Neural chain: _____

Motor unit: _____

Neuromuscular junction: _____

6. Complete the following table:

muscle	origin	insertion	movement
biceps			
triceps			
deltoid			
pectorals			
latissimus dorsi			
trapezius			
abdominals			
gluteals			
hamstrings			
quadriceps			
gastrocnemius			
soleus			
tibialis anterior			

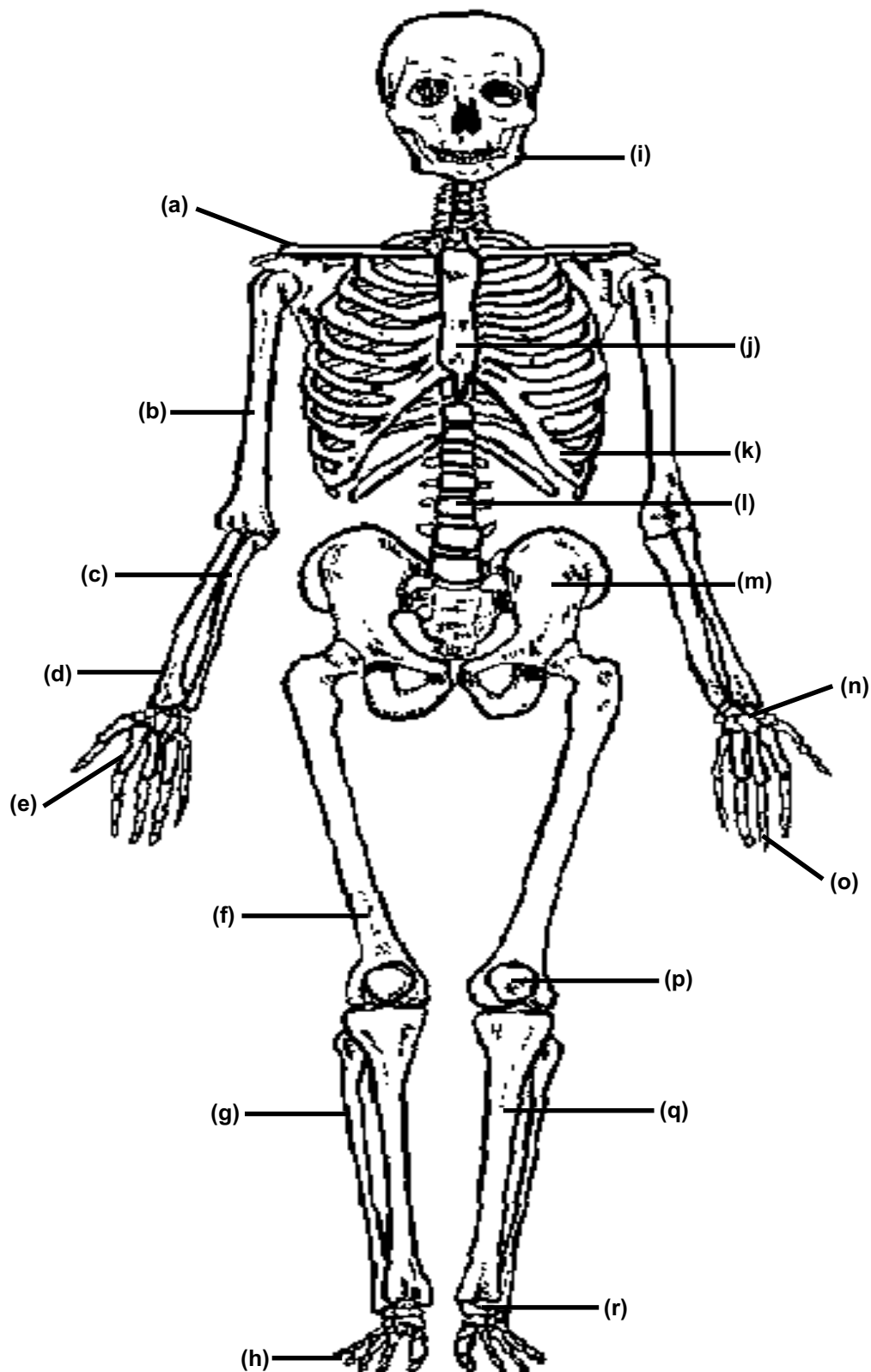
Section A - Multiple Choice:

1. From inferior to superior the curvatures of the spine are the:
A/ lumbar, sacral, cervical, thoracic.
B/ cervical, thoracic, lumbar, sacral.
C/ sacral, lumbar, thoracic, cervical.
D/ thoracic, lumbar, sacral, cervical
2. Bones are attached to each other mainly by means of:
A/ ligaments and skin.
B/ muscle and skin.
C/ ligaments and muscle.
D/ tendons and muscle.
3. Cancellous bone tissue is:
A/ of honeycombed appearance.
B/ heavy.
C/ strong.
D/ A and C above.
E/ B and C above.
4. Growth plates are also known as:
A/ epiphyseal plates.
B/ cancellous plates.
C/ calcium plates.
D/ bone plates.
5. Which of the following is *NOT* a category of joint ?
A/ cartilagenous
B/ fibrous
C/ hyaline
D/ synovial
6. A joint capsule will surround:
A/ all joints.
B/ synovial joints.
C/ hyaline joints.
D/ all of the above.
E/ none of the above.
7. Which of the following is an example of a *saddle* joint ?
A/ the base of the thumb
B/ the ankle
C/ the knee
D/ the hip
8. The movement known as *circumduction* is a combination of:
A/ abduction, adduction, pronation, supination.
B/ inversion, eversion, flexion, abduction.
C/ flexion, extension, hyperextension.
D/ flexion, extension, abduction, adduction.
9. Whilst carrying a tray in front of the body with the hands lying flat under the tray:
A/ the hands are flexed.
B/ the hands are extended.
C/ the hands are supinated.
D/ the hands are pronated.
10. The function of the *hyaline cartilage* is to:
A/ protect the bone.
B/ reduce friction in the joint.
C/ grease the surface of the joint.
D/ all of the above.
E/ none of the above.

/ 10

Section B - Short answer questions:

1. Label the diagram of the skeleton below:



/ 18

2. List four functions of the skeleton.

- (i) _____ (ii) _____
(iii) _____ (iv) _____ /2

3. Give two examples of a *long* bone.

- (i) _____ (ii) _____ /2

4. Give two examples of a *short* bone.

- (i) _____ (ii) _____ /2

5. Give two examples of a *flat* bone.

- (i) _____ (ii) _____ /2

6. Give two examples of an *irregular* bone.

- (i) _____ (ii) _____ /2

7. List three factors affecting *growth*.

- (i) _____ (ii) _____ (iii) _____ /3

8. Name five structures or features common to all *synovial* joints.

- (i) _____ (ii) _____
(iii) _____ (iv) _____
(v) _____ /5

9. What is the function of each of the features listed in Question 8 ?

- (i) _____

(ii) _____

(iii) _____

(iv) _____

(v) _____
_____ /5

10. What classification of joint is each of the following ?

Shoulder : _____

Knee : _____

Joints of the Skull : _____

Joints of the Pelvis : _____

Wrist : _____

The first Cervical Vertebra : _____ /3

11. Name the bones that form each of the following joints.

Shoulder : _____

Knee : _____

Elbow : _____

Hip : _____ /2

12. Name the movement for the following arm actions.

Bending the elbow to take a drink: _____

Raising the arm to the side: _____

Raising the arm to the front: _____

Rotating the hand to the palm *UP* position: _____ /2

13. Name the movement for the following leg actions.

Straightening the knee to kick a ball: _____

Pushing the foot down on the accelerator pedal: _____

Twisting the foot to turn the sole outward: _____

Lifting the thigh straight out in front of the body: _____ /2

MULTIPLE CHOICE = /10 SHORT ANSWER = /50 TOTAL = /60

Multiple Choice Questions:

1. C 2. C 3. D 4. A 5. C
6. B 7. A 8. D 9. C 10. D

Short Answer Questions:

1. (a) clavicle (b) humerus (c) ulna (d) radius (e) metacarpals
 (f) femur (g) fibula (h) digits (i) mandible (j) sternum
 (k) ribs (l) spine (m) pelvis (n) carpals (o) digits
 (p) patella (q) tibia (r) tarsals
2. movement, support, protection, production of blood cells
3. humerus, femur, fibula, radius, etc.
4. carpals, tarsals
5. skull, scapula
6. face, vertebra
7. diet, exercise, injury, etc.
8. joint capsule, hyaline cartilage, synovial membrane, synovial fluid, ligaments, etc.
9. joint capsule - surrounds and stabilises joint.
 hyaline cartilage - protects bones, decreases friction
 synovial membrane - secretes synovial fluid
 synovial fluid - lubricates joint
 ligaments - holds bones together
10. shoulder - synovial / ball and socket
 knee - synovial / hinge
 skull - fibrous
 pelvis - cartilagenous
 wrist - synovial / gliding
11. shoulder - scapula, clavicle, humerus
 knee - femur, tibia, patella
 elbow - humerus, radius, ulna
 hip - pelvis, femur
12. flexion
 abduction
 flexion
 supination
13. extension
 plantar flexion
 eversion
 flexion

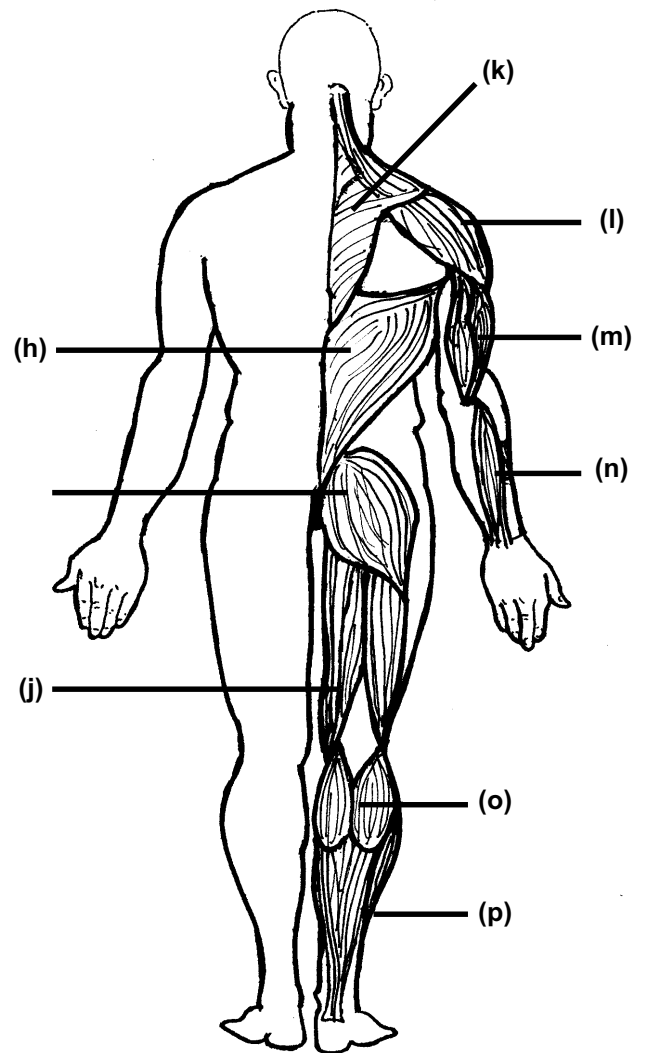
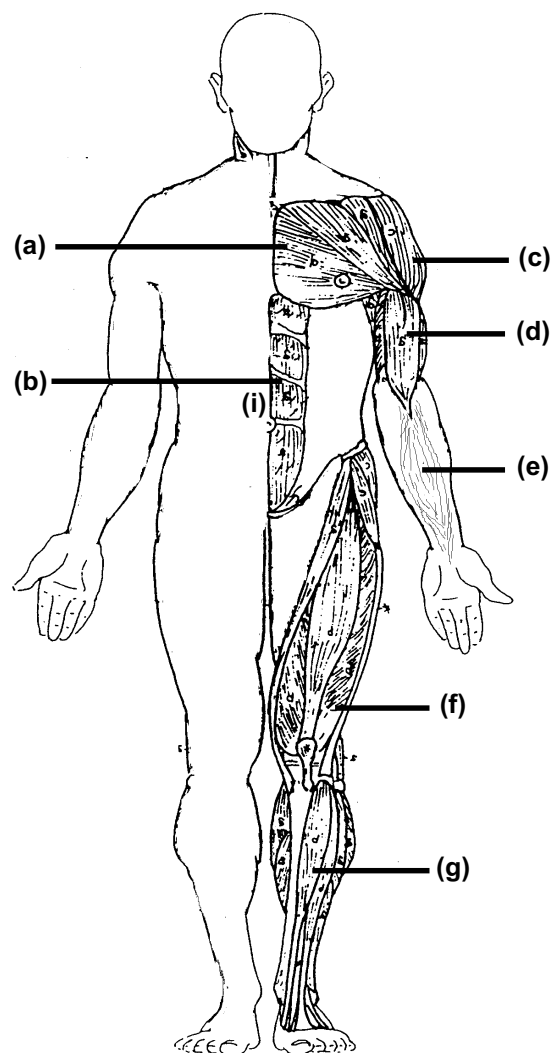
Section A - Multiple choice:

1. Which of these arrangements of muscle fibres allows for the greatest strength ?
A/ fusiform
B/ pennate
C/ skeletal
D/ smooth
2. The muscles mainly responsible for making movements are known as:
A/ stabilisers.
B/ antagonists.
C/ agonists.
D/ fixators.
3. When a muscle contracts it becomes:
A/ shorter.
B/ longer.
C/ it can be either of the above.
D/ it can be neither of the above,
4. In the action of *squatting down* which muscle group is contracted ?
A/ the quadriceps - concentrically
B/ the quadriceps - eccentrically
C/ the hamstrings - concentrically
D/ the hamstrings - eccentrically
5. A muscle can exert its greatest force during which type of contraction ?
A/ isokinetic
B/ isotonic - concentric
C/ isotonic - eccentric
D/ isometric
6. Which pair of muscles *does not* have an agonist - antagonist relationship ?
A/ trapezius - rhomboids
B/ biceps - triceps
C/ quadriceps - hamstrings
D/ erector spinae - abdominals
7. The muscle fibres responsible for explosive movements are:
A/ fast twitch.
B/ quick twitch.
C/ slow twitch.
D/ ballistic twitch.
8. The muscle responsible for *shrugging* the shoulders is the:
A/ trapezius.
B/ rhomboids.
C/ latissimus dorsi.
D/ pectoralis major.
9. The origin and insertion of the biceps muscle are:
A/ radius and humerus.
B/ ulna and humerus.
C/ radius and scapula.
D/ ulna and scapula.
10. The messages the brain sends to the muscles are:
A/ chemical.
B/ electrical.
C/ mechanical.
D/ fibrous.

/10

Section B - Short answer questions:

1. Label the diagram of the muscular system below:



(a) _____
 (c) _____
 (e) _____
 (g) _____
 (i) _____
 (k) _____
 (m) _____
 (o) _____

(b) _____
 (d) _____
 (f) _____
 (h) _____
 (j) _____
 (l) _____
 (n) _____
 (p) _____

2. Name and give an example of the three different types of muscle.

- (i) _____
- (ii) _____
- (iii) _____ /3

3. How does the message from the brain reach the muscles ?

_____ /2

4. (a) What is a *motor unit* ?

_____ /1

(b) What is a *neuromuscular junction* ?

_____ /1

5. What is an *agonist* muscle ?

_____ /2

6. What is an *antagonist* muscle ?

_____ /2

7. Explain the process known as *reciprocal inhibition*.

_____ /5

8. Name the three types of muscle contraction and briefly define each:

- (i) _____

- (ii) _____

- (iii) _____

- /6

9. Name the muscle responsible for:

- Abducting the arm: _____
- Flexing the forearm: _____
- Extending the forearm: _____
- Plantar flexion: _____
- Flexing the hip: _____
- Flexing the knee: _____
- /6

10. Which muscle is mainly responsible for the following actions ?

- Sit ups: _____
- Push ups: _____
- Chin ups (overhand grip): _____
- Vertical jump: _____
- /4

MULTIPLE CHOICE = /10 SHORT ANSWER = /40 TOTAL = /50

Multiple Choice Questions:

1. B 2. C 3. C 4. B 5. D
6. A 7. A 8. A 9. C 10. B

Short Answer Questions:

1. (a) pectorals (b) abdominals (c) deltoid (d) biceps (e) wrist flexors
(f) quadriceps (g) tibialis anterior (h) latissimus dorsi (i) gluteals (j) hamstrings
(k) trapezius (l) deltoid (m) triceps (n) wrist extensors
(o) gastrocnemius (p) soleus
2. Smooth - intestines
Cardiac - heart
Skeletal - biceps
3. Electrical impulse via the neurons.
4. Motor unit - the neuron and the muscle fibres it activates.
Neuromuscular junction - the intersection of the neuron and the muscle fibres.
5. Agonist - the muscle primarily responsible for the action.
6. Antagonist - the muscle that relaxes to allow the agonist to contract.
7. Muscles work in pairs - when the agonist contracts the antagonist must relax and vice-versa
Eg: biceps / triceps.
8. Isotonic - muscle length changes during contraction.
Isometric - muscle length is unchanged (remains fixed) during contraction.
Isokinetic - special machines (eg: cybex) allow maximal tension throughout the full range of motion.
9. Abducting the arm - deltoid
Flexing the forearm - biceps
Extending the forearm - triceps
Plantar flexion - gastrocnemius
Flexing the hip - quadriceps
Flexing the knee - hamstrings
10. Sit ups - abdominals
Push ups - pectorals (triceps)
Chin ups - latissimus dorsi
Vertical jump - quadriceps (calf muscles)