

YMCAfit courses - An introduction to the theory knowledge

Although many of YMCA Fitness Industry Training's (YMCAfit) courses are largely practical, they do involve learning technical and theoretical information.

Students will need to complete written work and theory papers during the course and assessment. Therefore, it is very important that you are a fluent speaker of English, a confident reader, have excellent comprehension skills, good vocabulary and a reasonable standard of written English.

We want your learning experience with YMCAfit to be as positive as possible so we have produced a short introduction to the kind of information and language you will need to learn. This is on the next page, followed by a short quiz.

Please complete this quiz, as it may help you decide whether you are ready to do a course now.

If, having completed this quiz, you have any concerns please contact YMCAfit's Learning Support team before you book your course.

We can discuss the course further and provide some top tips on how you can prepare for the course. We are available Monday to Friday 9am– 5pm.

YMCAfit Learning Support team

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Joint movements

In order to perform exercises in a safe and effective manner it is important that you understand what movements a joint is capable of performing. Joint movements are determined from the standard anatomical position. The anatomical position is assumed when standing erect with the feet facing forward and palms facing forward.

1. **Flexion:** reduce the angle at the joint or to bend a limb, for example bending the arm at the elbow.
2. **Extension:** return from flexion, increase the angle at the joint, or to straighten a limb, for example, extending the arm above the shoulder or straightening the leg.
3. **Hyperextension:** move a joint beyond the standard anatomical position, for example, when standing tall and extending (leaning) the spine backwards (thus, moving the spine beyond the standard anatomical position).
4. **Adduction:** bring towards or cross the midline of the body, for example, drawing the leg across the body.
5. **Abduction:** take away from the midline of the body, for example, raising the arm or leg.
6. **Elevation:** raise a joint, as in lifting the shoulders, for example, shoulder shrugging.
7. **Depression:** pull down a joint, as in pulling down the shoulders.
8. **Lateral flexion:** bend sideways with the trunk or neck, for example, standing side bends or tilting the head.
9. **Lateral extension:** straighten from a sideways bending movement, for example, returning to the natural upright anatomical position after performing a side bend of the trunk.
10. **Horizontal flexion:** forward movement in a horizontal plane, for example, drawing the arm across the body as in a 'Pec dec' exercise.
11. **Horizontal extension:** backward movement in a horizontal plane, for example, swinging the arm away from the body.
12. **Rotation:** rotary movement, inward or outward, about the long axis of the bone, for example, turning the hip in and out, or turning the thoracic spine to the side as in trunk twists.
13. **Circumduction:** circle part of the body, for example, the arm.
14. **Pronation:** turn the palm down.
15. **Supination:** To turn the palm up.
16. **Plantar-flexion:** To point the toes away from the body, as in the upward movement of a standing calf raise.
17. **Dorsi-flexion:** To pull the toes, towards the body, as in digging the heel in the ground.
18. **Protraction:** The shoulders are drawn forwards, rounding the shoulders.
19. **Retraction:** The shoulders are drawn backwards, opening out the chest.

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The skeleton

The framework of bones, joints and cartilage of the human body is called the skeletal system. Without this framework we would be unable to perform movements such as walking, grapevines, squats, step ups or press ups. We would simply be blobs of muscle and fat.

Such an image reflects the most obvious function of the skeleton which is to support the body. The skeletal system also performs the following functions:

1. Movement

The skeleton provides a series of independently movable levers. When the muscles contract, the bones act as levers to produce movement.

2. Shape

The skeleton gives the body its characteristic shape and provides a framework for attachment of the muscles of the body.

3. Protection

The skeleton protects the delicate internal structures. For example, the skull protects the brain, the rib cage protects the heart and lungs, the vertebral column protects the spinal cord and the pelvis protects the abdominal and reproductive organs.

4. Storage

Bones serve as storage areas for mineral salts, such as calcium and magnesium phosphate, both of which are essential for growth and good health. In fact, bone owes its hardness, ie, compression strength, to these mineral deposits.

5. Blood cell production

The marrow of certain bones constantly produces red and white blood cells.

Body types

Body shapes are classified as somatotypes (from the Latin 'soma' meaning 'body').

There are three types:

- **Ectomorphs** are characterised by lean, slim builds. Such people are generally better at coping with endurance events.
- **Endomorphs** are characterised by softness and roundness throughout the body. Such people tend to do well in long distance swimming events.
- **Mesomorphs** are characterised by the predominance of muscle. Such people are often good at sports that involve jumps, throws and sprints.

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Quiz

Please read the information above and use it to help you complete the questions. Choose one answer for each question. The answers are given at the end, and you can use these to work out your score.

1. What is the main and most obvious function of the skeleton?

Your answer: _____

2. Which of the following functions are also performed by the skeleton?

- a. Production of protein
- b. Storage of fat
- c. Production of red and white blood cells
- d. Storage of carbohydrate

3. Which of the following protects the abdominal and reproductive organs?

- a. The rib cage
- b. The skull
- c. The pelvis
- d. The vertebral column

4. Which of the following best describes endomorphic body types?

- a. Lean and slim
- b. Rounded
- c. Muscular
- d. Slim and muscular

5. An individual who excels at endurance events such as long distance running tend to be:

- a. Ectomorph
- b. Mesomorph
- c. Endomorph
- d. Somatotype

6. If you bend your arm at the elbow what best describes that movement?

- a. Flexion
- b. Elevation
- c. Rotation
- d. Abduction

7. What is adduction?

- a. Taking away from the midline of the body
- b. Bringing towards or across the midline of the body
- c. Bending sideways with the trunk or the neck
- d. Straightening from a sideways position

8. What term best describes the straightening of a leg?

- a. Depression
- b. Elevation
- c. Extension
- d. Rotation

Now check your answers.

You have completed the quiz, use the answers below to work out your score.

- 8. c
- 7. b
- 6. a
- 5. a
- 4. b
- 3. c
- 2. c
- 1. To support the body