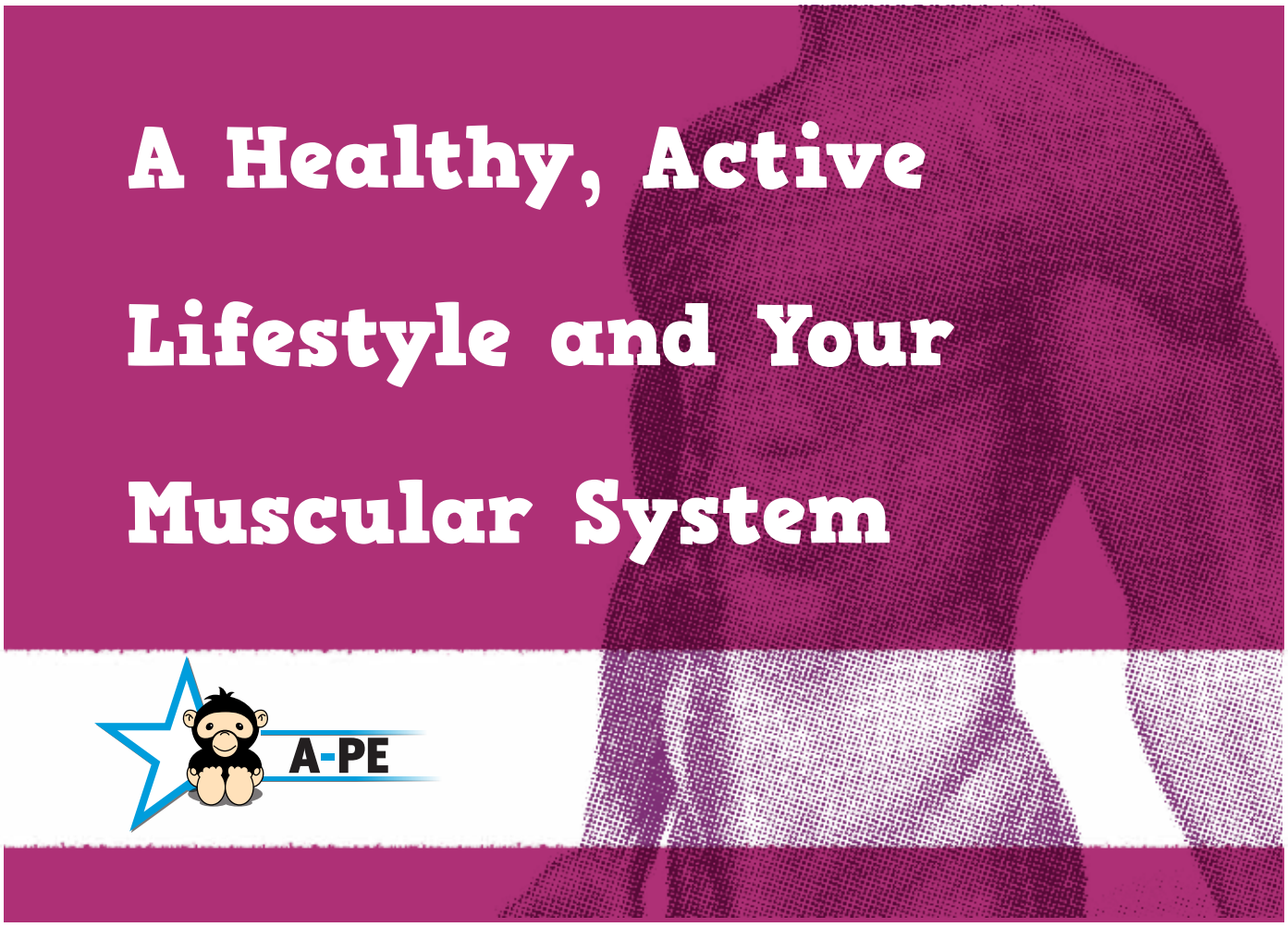
A Healthy, Active Lifestyle and Your Muscular System



Tendon of Insertion

Isotonic

Antagonist

Synergists

Fast-Twitch

Antagonistic Pairs

Tendon of Origin

Keywords

Healthy, Active Lifestyles and Your Muscular System

Cardiac Muscle

Muscle Tone

Isometric

Voluntary Muscle

Slow-Twitch

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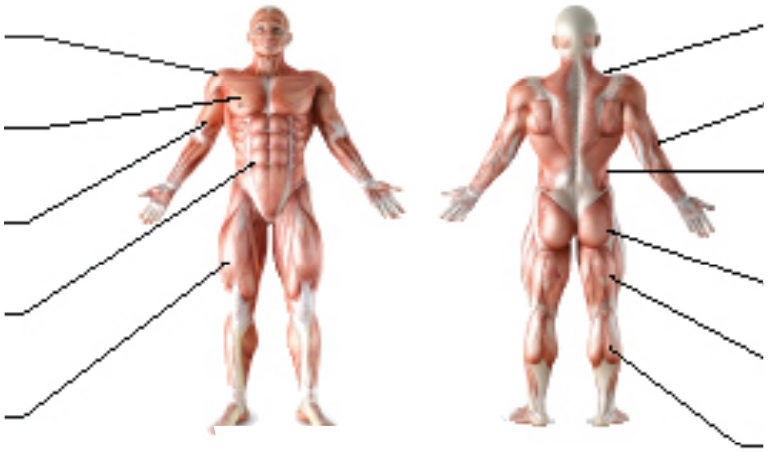
Worksheet

1. Muscular System

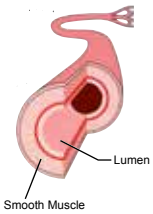


2. Types of Muscle

_____ **muscle** - Smooth Muscle that works without consciousness.

a. **Arteries** - The walls of the arteries contract and push the blood along.

b. _____ - When the walls contract food is squeezed through the gut.



_____ **Muscle** - Smooth muscle that works _____ **consciousness** that **works non-stop** without tiring.

a. Found in the _____ **of the** _____.

b. When it contracts it beats the walls **squeeze the blood along** the circulatory system.

_____ **Muscle** - Works under conscience control.

a. _____ **muscle** attaches to bones by tendons called the origin and insertion.

b. They create _____ but they can only pull bones so they need to work in pairs.

c. Voluntary muscles **tire** so they can only work for a limited amount of time.

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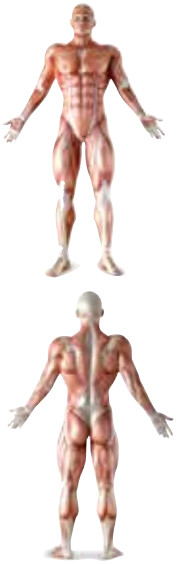
3. Muscle Movement

Voluntary	Main Action
Deltoid	Flexion, extension, adduction and abduction at the shoulder
Trapezius	Rotation at the shoulder
Pectorals	Rotation and adduction at the shoulder
Biceps	Flexion at the elbow
Triceps	Extension at the elbow
Latissimus Dorsi	Adduction, extension and rotation at the shoulder
Abdominals	Flexion at the trunk
Gluteals	Rotation and extension at the hip
Quadriceps	Extension at the knee
Hamstrings	Flexion at the knee
Gastrocnemius	Extension (plantar flexion) at the ankle joint



4. Antagonistic Pairs

Two good examples of antagonistic pairs are:

a. Hamstrings and Quadriceps

b. Biceps and Triceps

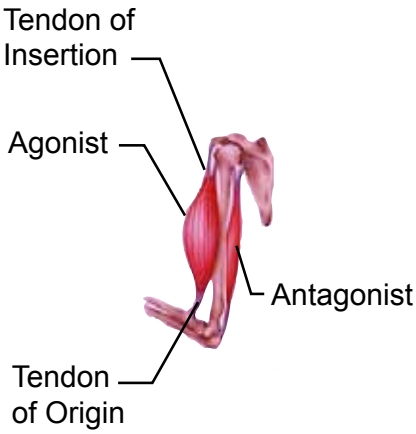
Muscles can only _____ so they have to work in _____ to create movement.

a. When the muscle contracts it _____ **on the moveable bone** attached by the **tendon of** _____.

b. It pulls _____ **the tendon of origin** on the **fixed bone**.

c. The **contracting muscle** is called the _____ _____ or **agonist**.

d. The other muscle in the pair **relaxes** and this is called the _____.



e. During movement other muscles called _____ contract to **support the contraction**.

f. During **muscle action** the **prime mover contracts** while the **antagonist** relaxes.

5. Types of Muscle Contractions

_____ **Contraction** - Muscle contraction that results in **limb movement**.

a. This is the most frequent muscle contraction during **sports play**.

b. When the **muscle contracts** it causes a _____ **movement**.

c. When the **muscle relaxes** it causes an _____ **movement**.

d. **Training** your muscles **isotonically** improves dynamic (moving) strength, power and endurance.

_____ **Contraction** - Muscle contraction with ____ **limb** _____.

a. Despite contracting the muscle length stays the same.

b. One muscle may contract isometrically to _____ **a movement** so others can contract isotonically.

c. Less sports require this muscle contraction but examples are **gymnastic handstand** or **rugby scrum**.

d. Training isometrically provides **little improvements**.

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6. Muscle Fibre Types

There are two different types of muscle fibre;

Slow Twitch	Fast Twitch
Contracts **slowly**	Contracts **quick**
Improved through **continuous training**	Improved through **interval training**
Uses **aerobic** energy	Uses **anaerobic** energy
Fatigues **slowly**	Fatigues **quickly**
Produces little **Lactic Acid**	Produces lots of **Lactic acid**
Suited to endurance sports	Suited to strength/ power sports

7. Immediate Affects of Physical Activity

a. Increased _____ _____.

▶ During increased muscle contraction more energy is required.

b. More blood _____ to the working muscles.

▶ Blood is redirected from the digestive system to the muscles.

c. Heart beat _____.

▶ Increased energy demand also results in an increased oxygen demand.

d. Muscles _____.

▶ Insufficient oxygen and glucose delivery.

e. Build up of _____ _____.

▶ Due to working anaerobically.

f. Muscle _____.

▶ Small muscle tears develop during contractions.

g. Muscles produce _____.

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8. Trained Muscles and Performance

a. Increased Physical Performance

- Increase in **muscle** _____ and _____.
- Increase in _____.
- Increase in **muscular** _____.

b. Decreased Risk of Injury

- Muscles act as **shock** _____ so well conditioned muscles reduce the landing forces.
- More muscle around the joint helps **reduce joint** _____.

c. Increased number of _____ **surrounding the muscle**.

- **More capillaries** surround the muscle.
- The muscle tissue can therefore receive more ____ **and glucose**.

d. Increase in _____ **efficiency**.

- By increasing muscle size you **increase the body's** _____ so you burn more calories.
- Your fuel burning engine is called your **Basal Metabolic Rate**.

9. Rest

Rest allows the body to recover in a number of ways and can take up to 48 hours.

a. Allows the body to **recover** from **minor injuries**.

b. **Muscles** can **recover** from _____ and soreness.

c. Allows the muscles to _____ and improve.

d. Allows for any lost **fluids** to be **replaced**.

e. Gives time to **consume lost** _____ and refill glycogen stores in the muscle and liver.

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10. Muscle Tone

a. Voluntary muscles _____ **to** _____ or respond.

b. Muscles have **slight** _____ ready to be used.

c. When muscles are **trained their tone increases**.

d. The abdominal muscles tone helps with our _____.

e. **Posture** is important in _____ **sports** such as trampoline and gymnastics as well as **preventing back problems** later in life.

11. Muscle Injuries

Strain - caused by a _____ **or rupture in the muscle tissue** resulting in pain, swelling and bruising.

Strain should be treated with **R.I.C.E**

_____ - sit down or lie down and do not move.

_____ - cool the injured area by applying ice.

_____ - use a bandage to stop the swelling.

_____ - Raise the joint higher than the heart to reduce the swelling.

Sprains - caused by **stretched or torn** _____ from a sudden twisting movement.

Rest - sit down or lie down and do not move.

Ice - cool the injured area by applying ice.

Compression - use a bandage to stop the swelling.

Elevation - Raise the joint higher than the heart to reduce the swelling.

Muscle _____

a. When we stop training our muscles can _____ **in size**.

b. This especially happens when the limb is **restricted from moving** for a long period of time.

c. This might happen when you break your leg and it is put in a **cast**.

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12. Diet

_____ is the most important nutrient for muscle tissue.

Why is it important?

- They _____ **muscle tissues** to make the body stronger.
- They _____ **muscle tissue**.

Sources of food

- _____, _____ and **nuts**.

How much

- **2 grams per kilo weight** to build muscle mass.
- **1 gram per kilo weight** for someone not aiming to gain weight.

13. Performance Enhancing Drugs

Athletes sometimes use banned substances to improve their muscle performance.

Type of Drug	Effect on Performance	Risks	Sports Used
Narcotic-analgesics	Painkillers mask the pain of injury.	Injuries become more severe, nausea, drowsiness, dry mouth and constipation	Used in all sports where injuries are sustained.
Peptide hormones & analogues	They mimic the effect of naturally occurring hormones. Increase muscle strength and growth.	Allergic reactions, high blood pressure, abnormal growth in hands, feet and face.	Weight lifter to increase muscle mass.
Anabolic Steroids	Quick increase in strength. Able to train for longer.	Heart disease, high blood pressure, kidney and liver disease, infertility and aggression.	Strength and power related sports such as weightlifting and sprinting

14. Blood Doping

a. The **higher** the _____ of **red blood cells** the **more** _____ can be delivered to the working muscles.

b. Long distance athletes such as **cyclists** and **marathon** runners may use this method.

c. **Blood** is _____ from the athlete a few weeks before competition.

d. The **red blood cells** are _____ and _____.

e. **Just before** the **event** the red blood cells are _____ and _____ **back into the athlete.**