# 2020-1-SK01-KA226-SCH-094350

**THE MUSCULAR SYSTEM**

* The skeleton and the muscles form the musculoskeletal system responsible for the movement of the body.
* There are approx. 600 muscles in the body.
* The muscles make up 36% of body weight in men and 32% body weight in women.
  + skeletal muscles – firm, flexible, connected to blood vessels and nerves
  + attached to the skeleton directly or with tendons
  + the basic building unit of a skeletal muscle is a multinucleated muscle fibre – covered by **sarcolemma** → 10 – 100 fibres → muscles fibre bundle → fascicle → muscle  
    The muscle is covered in connective tissue – **fascia.**

Muscles are divided into three functional groups: **1. muscles of the head and neck**

**2. muscles of the torso**

**3. muscles of the limbs**

**1. muscles of the head and neck**

There are 2 functional groups – **the muscles of mastication and the muscles of facial expressions.**

* **muscles of mastication –** they move the jaw - ***temporalis, masseter***
* **muscles of facial expressions** - connected to the skin, which they move and form facial expressions and they do not have a fascia – **orbicularis oculi, orbicularis oris, zygomaticus major, zygomaticus minor, risorius, frontalis, corrugator supercilii, nasalis**.

The muscles of the neck provide head movement. They are organised in several layers:

* ***the sternocleidomastoid muscle*** – rotates and lifts the head
* ***scalene muscles –*** bend and tilt cervical vertebrae (suprahyoid and infrahyoid muscles – chewing, swallowing, tongue movements, lip movements when talking, muscles of the pharynx and larynx - voice formation, breathing)

**2. muscles of the torso**

Muscles of the chest:

* ***pectoralis major*** – superficial, moves and rotates the humerus
* ***pectoralis minor***
* ***external intercostals*** *-* inhalation
* ***internal intercostals*** - exhalation
* ***diaphragm*** – a skeletal muscle dividing the thoracic and the abdominal cavities. When inhaling, it moves downwards, when exhaling, it moves upwards.

Muscles of the abdomen:

* ***external and internal oblique***
* ***transverse abdominal* –** supports the entrails
* ***rectus abdominis*** – forms the front wall of the abdomen

The muscles of the abdomen form the abdominal wall – it protects the entrails, allows the emptying of intestines and the bladder, childbirth and helps with breathing.

Muscles of the back:

* superficial - ***trapezius*** *–* changes the position of the scapula (outlines the nape)

*-* ***latissimus dorsi***– abduction, extension (with paired **serratus posterior muscles** underneath)

* deep – they connect the vertebrae from the neck down to the tailbone, they allow the bending and rotation of the spine and head

Muscles of the pelvic floor

* ***pelvic diaphragm***
* ***urogenital diaphragm***
* ***external anal sphincter***

**3. muscles of the limbs**

**Upper limb**

There are many, they consist of the muscles of the shoulder girdle and the arm and hand.

* muscles of the girdle – ***deltoid*** - abduction of the arm
* muscles of the arm/hand:
* *arm:* - **flexors – *the biceps*** = *biceps brachii –* bending at the elbow

- **extensors** – ***the triceps* =** *triceps brachii*

* *forearm* – they allow movement at the elbow and the joints of the wrist and hand –
  + flexors – ***flexor carpi radialis, flexor digitalis profundus***
  + extensors – ***extensor carpi ulnaris***
  + pronators – ***pronator teres***
* *hand –* very small, they allow precise movements of the fingers and holding

**Lower limb**

They provide walking.

* *pelvic girdle* = *muscles of the hip* – they provide movement in the pelvic joint
  + ***iliopsoas muscle***,
  + ***gluteus maximus, gluteus medius, gluteus minimus***
* *leg and foot*
* *thigh* – provide movement in the pelvic joint and the knee
  + - anterior - **quadriceps femoris, sartorius** (the longest muscle in the body)
    - posterior – **biceps femoris**
* *crus -* moves the foot and the toes
  + **tibialis anterior**,
  + **extensor digitorum longus**,
  + **triceps surae** – connected to the calcaneus by the Achilles tendon
* *foot* – groups of muscles forming the dorsum and the arch of the foot