

Muscles

The Major Muscles of the Human Body



About this video



MUSCLES

The Major Muscles of the Human Body

Whenever you move, from pointing to jumping, dozens of muscles work together to make it happen. How? With a focus on skeletal muscles, this video follows the series of events that coordinate movement, from motor neurons to muscle fibres and sarcomeres.

Essential question:

What happens to our major muscles when we perform everyday movements?

Key vocabulary:

antagonist

agonist

myofibril

sarcomere

actin

myosin

isotonic

isoinertial

isometric

Learning intention:

Learn about the different types of muscles in the human body and understand the role they play in every movement we make.

Before watching

Make predictions: Playing with dumbbells

- Show the students a weight or dumbbell and ask them what it is and how and why it might be used.
- Ask the students:
 - What dumbbells are?
 - How are dumbbells used?
 - Why are dumbbells used?
 - Point out the muscles in your body being targeted by using dumbbells.
- Establish that the students know where their biceps and triceps are and identify where they are in the model of the human skeleton or in the students' own body.
- Put the students into small groups and get them to work together to predict what is happening with their biceps and triceps when they curl and straighten their arm.
- Encourage the students to use appropriate scientific vocabulary e.g., contract, relax, antagonistic pair of muscles.

Before watching

Literacy connection

Incorporate literacy with the video by introducing the following vocabulary. Students should self-assess themselves on their prior knowledge of each word, and provide a predicted meaning as well.

| Word | Self-Assessment Score | Predicted Meaning |
|-------------|-----------------------|-------------------|
| agonist | 1 2 3 4 | |
| antagonist | 1 2 3 4 | |
| myofibril | 1 2 3 4 | |
| sarcomere | 1 2 3 4 | |
| actin | 1 2 3 4 | |
| myosin | 1 2 3 4 | |
| isotonic | 1 2 3 4 | |
| isoinertial | 1 2 3 4 | |
| isometric | 1 2 3 4 | |

Self-Assessment Score Scale

1: I have never seen this word before
2: I have heard of this word, but I don't know what it means
3: I know what this word means
4: I know what the word means, and could give an example

Whilst watching



Watching as a class



Watch the interactive video as a class and ask students to respond to the prompts throughout the interactive.



Watching individually



Have students watch the interactive created for immediate feedback and solo viewing.

After watching

Below are two activities to extend the learning from the video and to check for understanding.

Activity 1: My life according to my muscles

Students work in groups to produce an A4 poster or storyboard to demonstrate their understanding of the different types of muscles and how their actions are essential for different activities. The students will respond to this activity from the perspective of their heart and upper arm muscles.

Each groups poster or storyboard should include the following:

- A type of activity
- The role of the biceps and triceps in the activity
- The role of the heart
- Terms from the key vocabulary in a way that defines or explains them: isotonic, isoinertial, agonist, antagonist, isometric, myofibril, sarcomere, actin, myosin
- Visuals to accompany the text

Some examples of the different activities could include:

- Running for the bus
- Swimming a length in a pool
- Painting a wall
- Playing basketball/football/tennis



Support:

Provide the following lists of definitions/descriptions for students who may require support as a way to help them get started on this activity.

| | |
|--------------------|---|
| Biceps | contracts to bend the arm |
| Triceps | contracts to straighten the arm |
| Isotonic | the tension or tone of the muscle stays the same as the muscle shortens |
| Isoinertial | the resistance pushing back is the same as the pushing against the weight, so the muscle or joint does not move |
| Agonist | describes a contracted muscle |
| Antagonist | describes a relaxed muscle |
| Isometric | when muscles are under tension to hold the contraction and keep the joint in the right position |

After watching

- Sarcomere** a unit of muscle tissue made from two proteins
- Actin** a protein in muscle involved in the muscle contracting
- Myosin** a protein in muscle involved in the muscle contracting

Extension:

Students have now learnt about isotonic and isometric muscle action. They can complete the table below to show the type of muscle action used for each activity. Choose from:

- Isometric
- Isotonic

| Type of activity | Type of muscle action |
|------------------|-----------------------|
| Biceps curls | |
| High plank hold | |
| Swimming | |
| Running | |
| Low squat | |
| Push ups | |

Alternatively, students could choose an activity that is not mentioned in the table. They are to:

- Identify whether the muscles are working in an isometric or an isotonic way.
- Justify their choice of isometric or isotonic for that activity.

After watching

Activity 2: Power to our legs

Students work in pairs and use ICT to research the key leg muscles and the role they play in one of the following:

- standing on tiptoe and then lowering the ankle back down
- bending and straightening the knee **or**
- raising the leg while standing and then lowering it back down

Students will present their findings using a maximum of two digital presentation slides (e.g. Keynote, Canva, Google Slides, etc.).

Each presentation should include the following:

- The type of physical activity
- The names of the muscles involved
- Identification of the agonist and antagonist for each action
- The student's own words, not cut and paste!
- One or more visuals

Support:

Provide students with a labelled diagram of the muscles in the legs, a list of suitable websites to begin the task with, and/or a slide template for students to populate.



Extension:

Students can research how muscle tissue can become injured and possible treatments.



Conclusion

Ask students to respond to the essential question posed at the beginning of the lesson.

Ask if they still have any questions about the content presented in the video. Discuss and answer these questions as a class.