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Name: ..... **Form:** .....

See **pages 30 and 31** of *The Body Book*

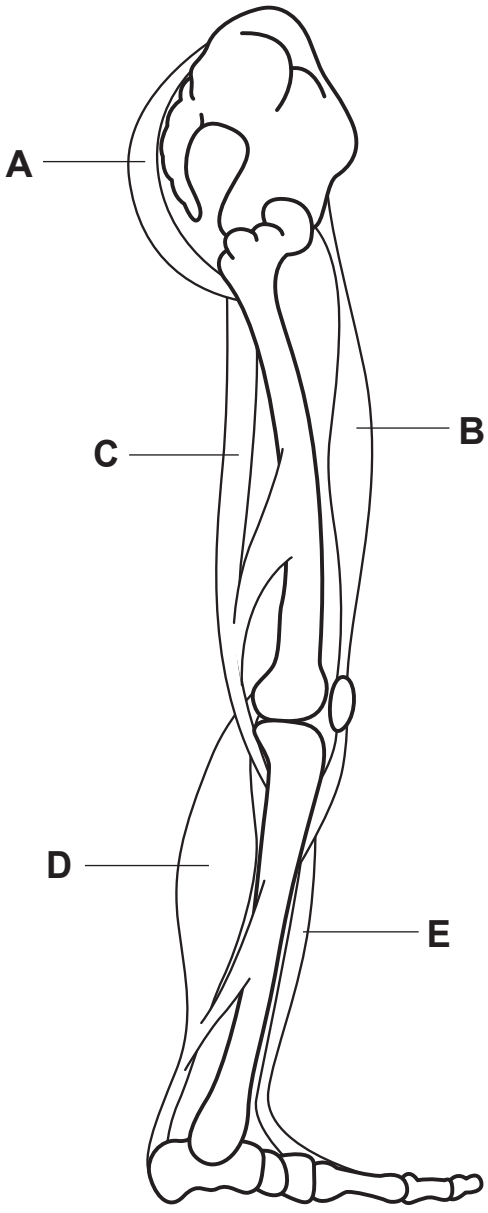
PRACTICAL

Muscles

The large diagram shows five muscles which move the bones in the leg when they contract.

(1) Try and work out which muscles are contracting to produce the five movements shown in the smaller pictures.

You may feel the muscles in your own legs as you try the actions to help you answer.

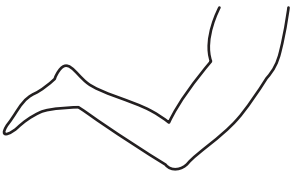


1 .....

2 .....

3 .....

4 .....



5 .....

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Teacher's sheet: Practical

See **pages 30 and 31** of *The Body Book*

Introducing the work

Use the following to integrate with Diagram 2 on page 31 of the *Students' Book*.

If someone is asked about the strength of their muscles, they may raise their arms and flex them to display biceps. This type of incident can be used to introduce this practical work. When someone is challenged to feel the bicep muscles, they are supposed to be impressed at how hard the muscle is. This can be built on by asking the class members to put their thumb and first finger three centimetres apart then stick the tips into the contracted biceps muscles and push in to feel how hard it is. Then with the finger and thumb tips still in place, the arm should be straightened. The muscle will feel softer and also longer. You may say that the bicep muscle has been lengthened by the action of the tricep muscle on the back of the upper arm, and ask the class to investigate this muscle with their finger and thumb. They should find the triceps becomes harder and shorter when the arm is outstretched, and longer and softer when the arm is flexed.

Pairs of muscles which produce opposite effects are called antagonistic muscles. The biceps and triceps are easy to see. Other skeletal muscles are arranged in similar pairs but cannot be investigated easily. To emphasise this point you could ask the class to feel the tendon of the biceps in the elbow joint as they flex and extend their arm. Then they should stretch out a hand and wiggle their fingers to see the tendons connected to the fingers moving under their skin. The class may be surprised to find that the muscles which operate their fingers are actually located in the lower arm and not between the fingers themselves. They may like to speculate on how their fingers would look if the muscles were attached between each finger bone. This one example shows how the arrangements of muscles on the skeleton can be complex.

Use the following to introduce this practical work.

The muscle diagram shown here is greatly simplified, to show the consequences of the action of five muscles in the leg. There are many more muscles in the leg, which the class will appreciate as they try to confirm their ideas by examining their own legs.

Before the class tries this activity you may also like to make sure that they are aware of the importance of tendons. These are tough, non-elastic cords which connect the muscle to the bone. The class may like to speculate on what would happen if the tendons were elastic (the muscles would pull on them instead of the bones and movement would be reduced).

They could also feel the hamstring tendons at the back of the leg.

Outcomes

The children:

- Can interpret diagrams.
- Can make observations and use them to answer questions.

Answers

(1) E.

(2) C.

(3) D.

(4) B.

(5) A, C and D.