

# **Muscle Contraction 2**

This slide show supports a class activity to learn the explanation of muscle contraction one step at a time.



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#### Instructions

Allocate one step to each member of the class. (Pairs are acceptable if >10 students)

Ask the students to prepare their individual explanation of one step.

Play the slides as students narrate the process.

At the end, students rotate one step forwards - 1a becomes 1b etc. 5b becomes 1a

Repeat the explanation 10 times, until everyone has explained each step.

For a bit of added pressure, time each explanation.

## **Muscle contraction - the steps**

#### 1) When a nerve impulse arrives Ca<sup>2+</sup> ions are released.

- a) Ca<sup>2+</sup> ions bind with troponin, causing it to change shape which exposes the myosin binding site.
- b) A cross-bridge is formed between actin and myosin.
- **C)** P<sub>i</sub> is released and the myosin head is bound to actin.
- 2) Energy in the head of the myosin myofilament
  - a) moves the head, which
  - b) slides the actin past.
  - **C)** ADP is released.
- 3) The myosin heads
  - a) disconnect from the actin to
  - b) grab more ATP.
- 4) The ATP is then broken down
  - a) into ADP and P<sub>i</sub>
  - b) The energy released is stored in the myosin head.

#### Step 1a



# Step 1b



## Step 1c



#### Step 2a



#### Step 2b



#### Step 2c



#### Step 3a



## Step 3b



#### Step 4a







#### Rotate

Students rotate one step forwards - 1a becomes 1b etc. 5b becomes 1a

Repeat the explanation 10 times, until everyone has explained each step.

For a bit of added pressure, time each explanation. Can you get faster?