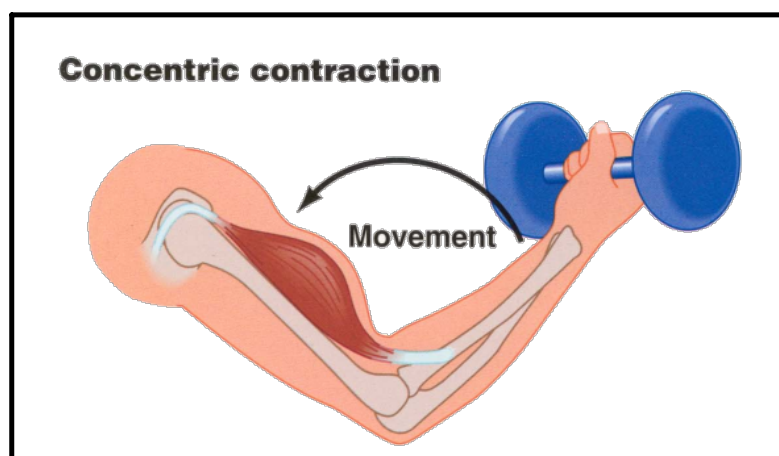


# TYPES OF MUSCULAR CONTRACTIONS

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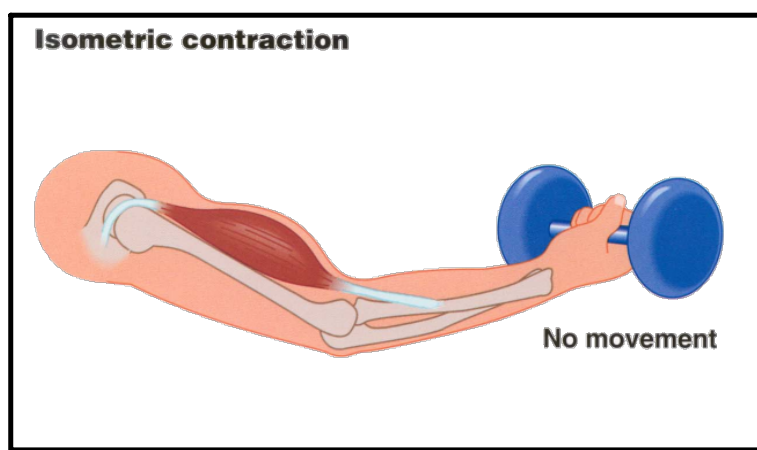
Muscle contraction intended to accomplish work results in tension developed within the muscle which either...

- overcomes a resistance (concentric contraction)
- equals a resistance (isometric contraction)
- is overcome by the resistance (eccentric contraction)



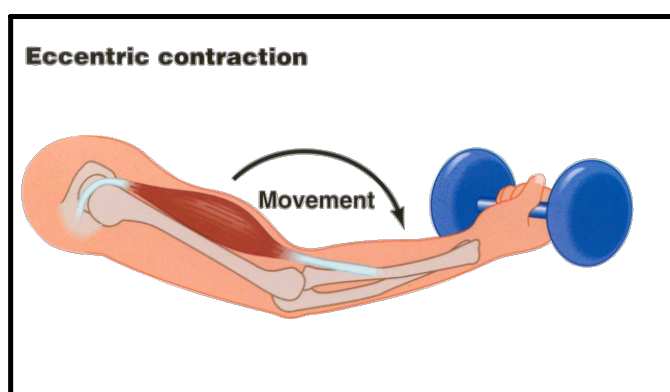
During **CONCENTRIC CONTRACTION** the origin and insertion of the muscle move closer together. Biceps contract concentrically during flexion of the elbow (lifting a weight).

COLOURING BOOK USES TERM **CONTRACTED**



During **ISOMETRIC CONTRACTION** considerable tension may be developed in the muscle but no movement is produced by the contraction. Perfectly matched arm wrestlers would exhibit this type of contraction.

COLOURING BOOK USES TERM **RELAXED**

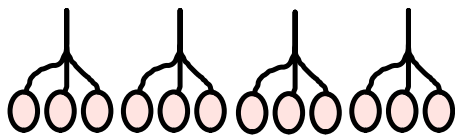


During **ECCENTRIC CONTRACTION** the origin and the insertion of the muscle move apart. Biceps contract eccentrically during the controlled lowering of a heavy book. Any controlled lowering where gravity would otherwise accelerate the movement involves eccentric contraction.

COLOURING BOOK USES TERM **STRETCHED**

## GRADES OF MUSCULAR CONTRACTION

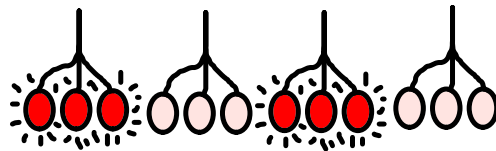
MUSCLE AT REST



○ relaxed muscle fiber

⊙ excited muscle fiber

PARTIAL CONTRACTION



MAXIMUM CONTRACTION

