Biology 20

Unit D: Human body systems

Muscle fatigue and care

ATP use in repeated lifts

- The single curl shows one gold ATP circle and one heat wave.
- The repeated curls show a stack of ATP circles and several heat waves.

Muscle force and fatigue

- Each contraction spends ATP and releases some energy as heat.
- Muscle fatigue shows up as a drop in force during repeated work.
- Creatine phosphate can rebuild ATP for a brief burst.

Key terms

muscle fatigue

The drop in force that appears when a muscle's ATP supply lags behind repeated work.

creatine phosphate

A small energy store in muscle that can quickly rebuild ATP for a short burst.

anabolic steroid

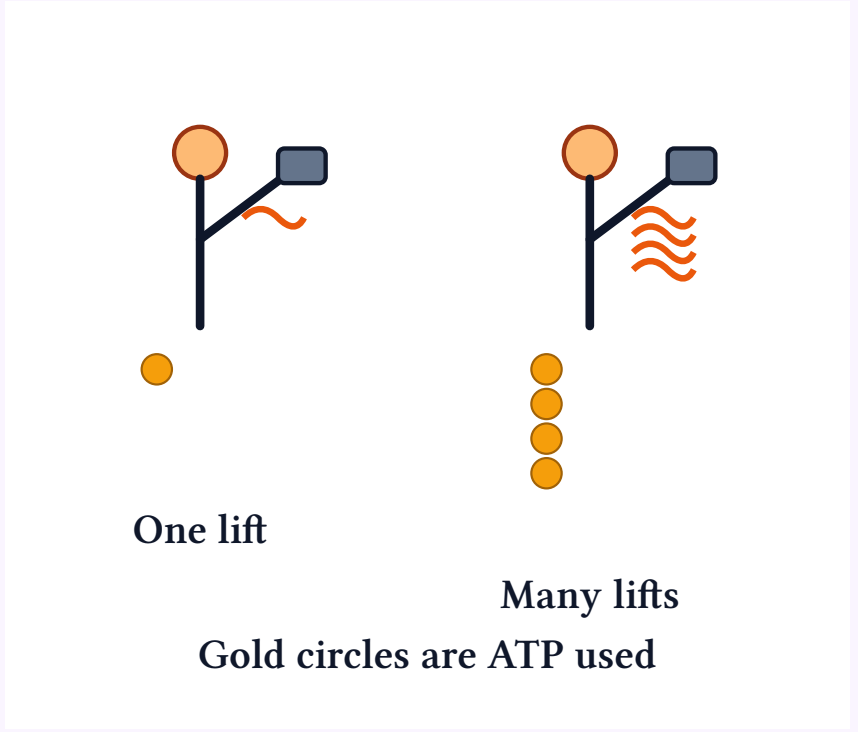
A drug related to testosterone that can increase muscle size and also harm other body systems.

tendonitis

Inflammation of a tendon, often after repeated overload where muscle meets bone.

More ATP use releases more heat

- Gold circles count ATP used, and they stack on the busy side.
- Heat waves increase on that same side.
- The muscle is the same arm in both drawings.



A small heat table

- Ten curls raise skin temperature more than two curls.
- The unit on the table is degrees Celsius.

Injury words and drug limits

- Atrophy is muscle loss from disuse, strain is a tear from overload, and tendonitis is an irritated tendon.
- An anabolic steroid can enlarge muscle and harm the heart, liver, and hormone balance.

Heat and care

- Relate ATP use and heat to repeated lifts.
- Define muscle fatigue and one injury, and name a steroid harm.

Heat still leaves the living system

- The heat waves on the busy arm are energy leaving the body.
- That same idea opened the course in the biosphere.