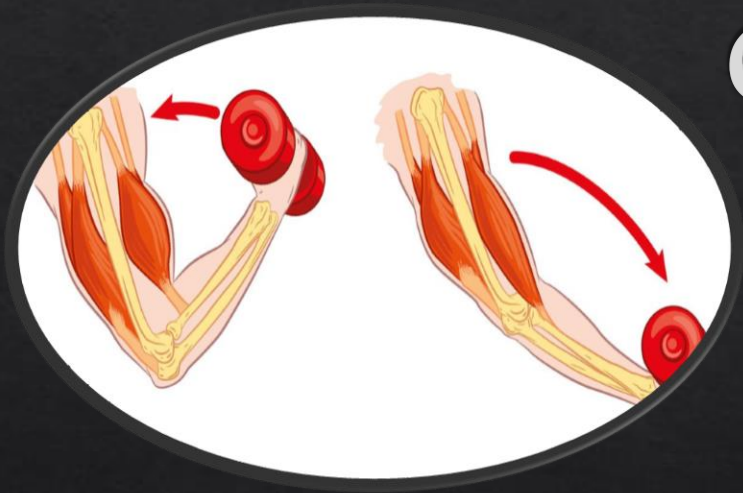


# English Tutorial Classes Week 3

## Resistance exercises – muscle contractions



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# Resistance Exercise

Resistance training is an exercise that focuses on **the contraction of a muscle (kontrakcija mišića)** against **resistance (otpor)**. Resistance training helps for many different reasons.



# Resistance Exercise

The main reasons is to increase one's **muscular endurance** (**mišićna izdržljivost**), strength, and power of the active muscles.





# Resistance Exercise

Resistance exercises can use any external resistance; a few examples are **dumbbells** (tegovi / bučice), **elastic bands** (elastične trake), your **bodyweight** (sopstvena težina tela), and even **canned goods** (konzervirana roba).





# Resistance Exercise

Canned  
goods?



# Resistance Exercise

These exercises consist of:

**ISOMETRIC** (izometrijske vežbe),

**ISOTONIC** (izotoničke vežbe),

**ISOKINETIC** (izokinetičke vežbe),

and **PLYOMETRIC EXERCISES** (pliometrijske vežbe).

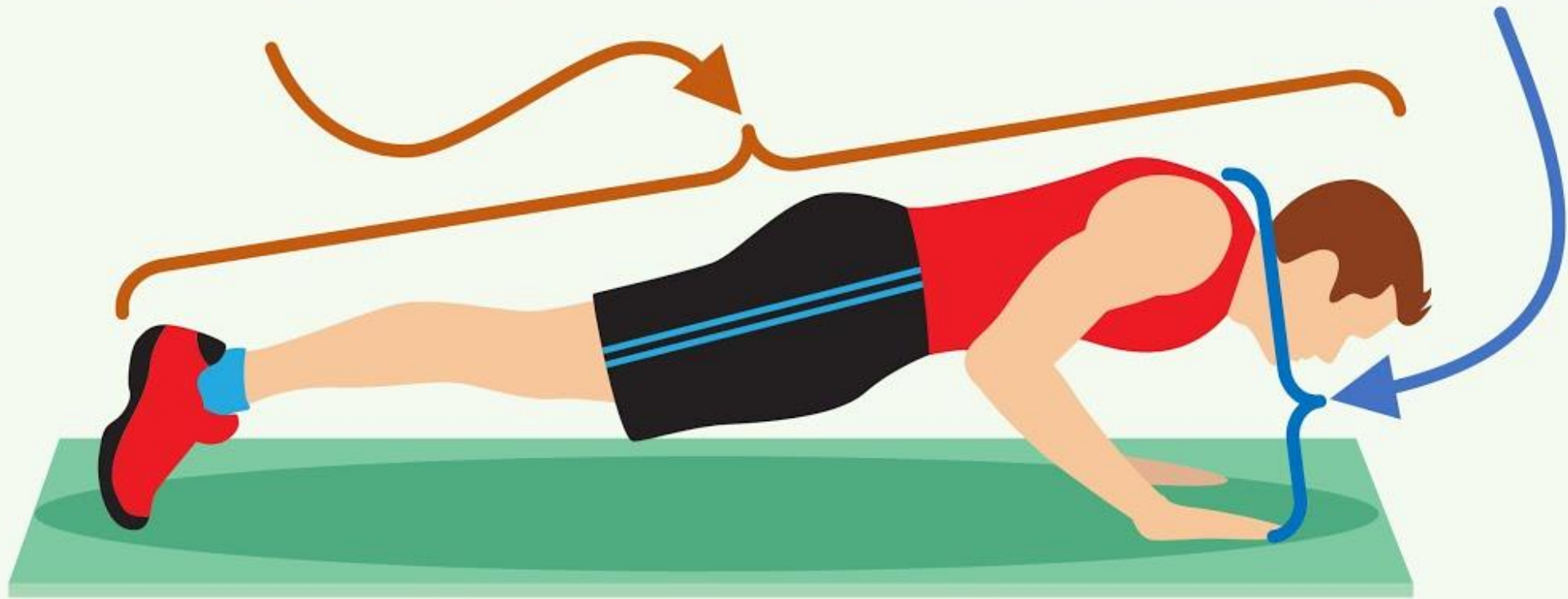
Within these exercises, there are two types of muscular contractions, **ISOMETRIC** (izometrijske kontrakcije) and **ISOTONIC CONTRACTIONS** (izotoničke kontrakcije).



Isometric  
Contraction

vs

Isotonic  
Contraction



# Isometric Exercise

Isometric exercises focus on isometric contractions. This type of exercise involves the contraction of a muscle **without movement of the joint (bez pokreta u zglobu)**.

The joint doesn't move, but **the muscle contracts without changing its length (mišić se napreže bez promene dužine)**. The absence of shortening and lengthening joints makes this exercise a great starting point for those who are recovering from surgery.





# Isometric Exercise

A few popular isometric exercises would be a **plank** (izdržaj), glute bridge (most sa aktivacijom zadnjice), and wall sits (sedenje uz zid).



# Isometric Exercise

When performing a plank, the **isometric contraction** (**izometrijska kontrakcija**) of your **core** (**mišići trupa**) can keep your body elevated off of the floor without changing length in a joint.





# Isotonic Exercise

Isotonic exercises may be the most familiar exercise of the four.

This type of exercise is dynamic and requires **MOVEMENT IN A JOINT** (pokret u zglobu).

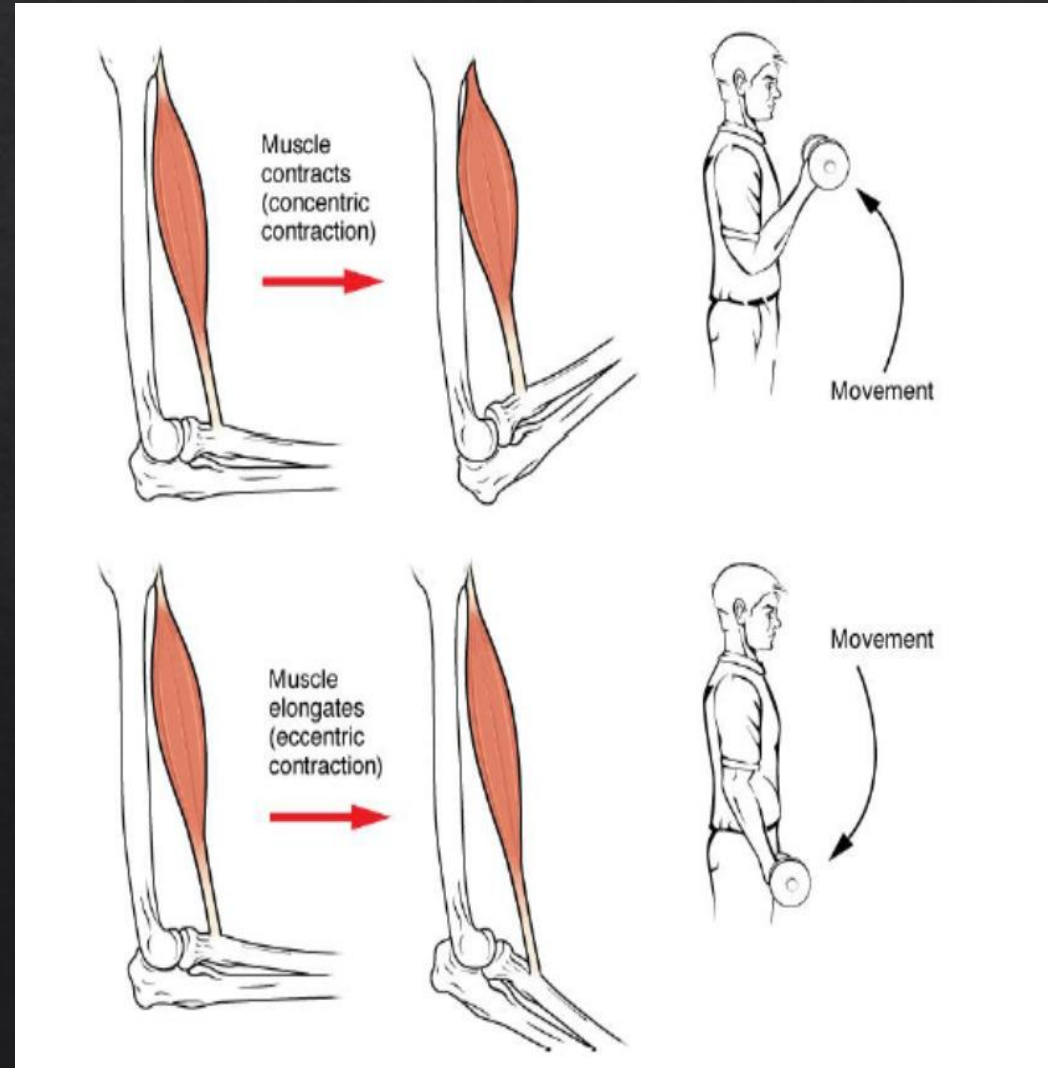
An isotonic exercise consists of two types of contractions: **concentric** (koncentrična kontrakcija) and **eccentric** (egzcentrična kontrakcija).



# Isotonic Exercise

In a **concentric contraction**, a muscle **tightens (mišić se zateže / skraćuje)** as it pulls against some form of resistance.

On the other hand, an **eccentric contraction** occurs when a muscle **lengthens (mišić se produžava)** while it still **exerts force (primenjuje silu)** to manage or resist an external load.

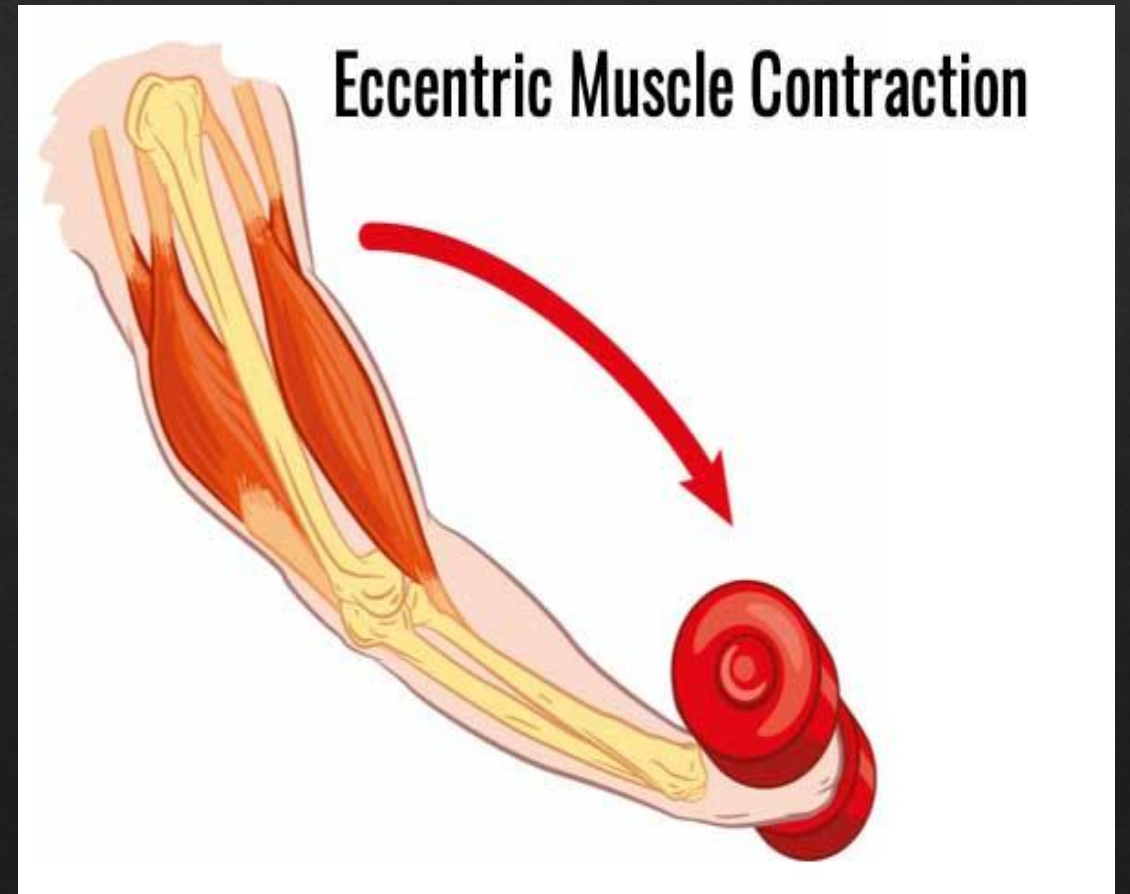




# Isotonic Exercise

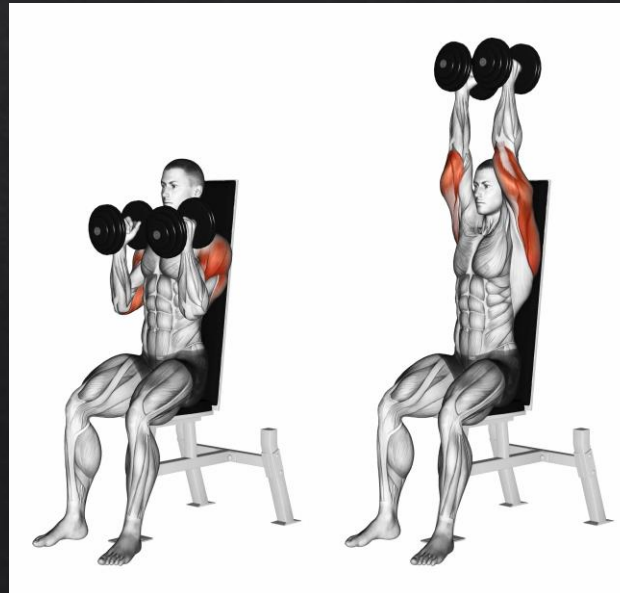
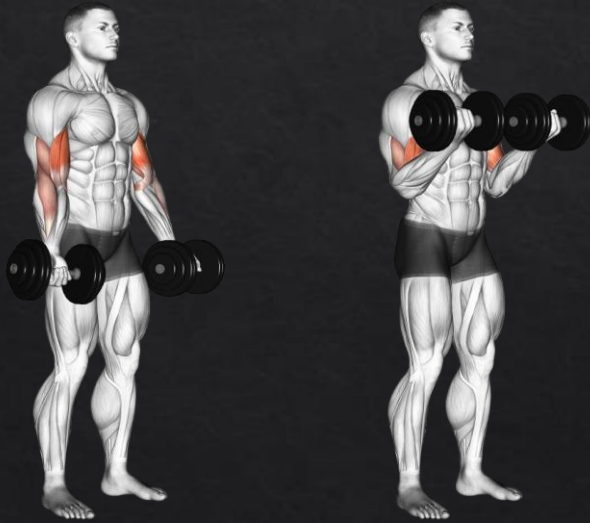
It's optimal to focus more time on an eccentric contraction rather than a concentric contraction.

When doing so, you are increasing the potential of strength and motor control.



# Isotonic Exercise

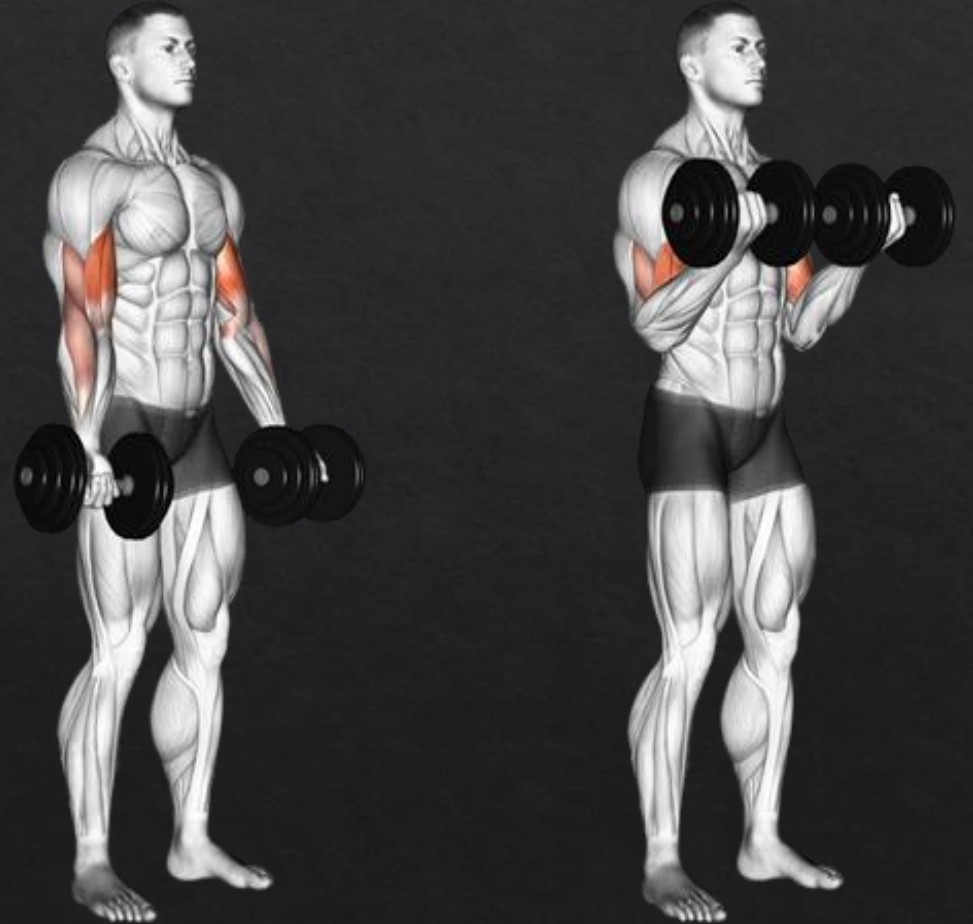
Examples of isotonic exercises are **bicep curls** (pregibi za biceps), **shoulder presses** (potisci za ramena), and **squats** (čučnjevi).





# Isotonic Exercise

You concentrically contract your bicep as you bring a dumbbell up towards your shoulder, and you eccentrically contract your bicep as you control the dumbbell back down to your side.



# Isokinetic Exercise

An isokinetic exercise involves shortening and lengthening a muscle (skraćivanje i produžavanje mišića) at a constant speed (konstantna brzina).

These exercises require machines (sprave / mašine) that help produce a constant speed and resistance in which they are performed.





# Isokinetic Exercise

The consistent **velocity (brzina)** and resistance lower the risk of injury while still increasing strength and flexibility in a muscle.



# Isokinetic Exercise

Isokinetic exercises are great for individuals who lack (nedostaje) **balance (ravnoteža)**, **coordination (koordinacija)**, and **experience (iskustvo)**.

**Stationary bikes (sobni bicikli)** and **treadmills (trake za trčanje)** focus on isokinetic resistance.





# Plyometric Exercise

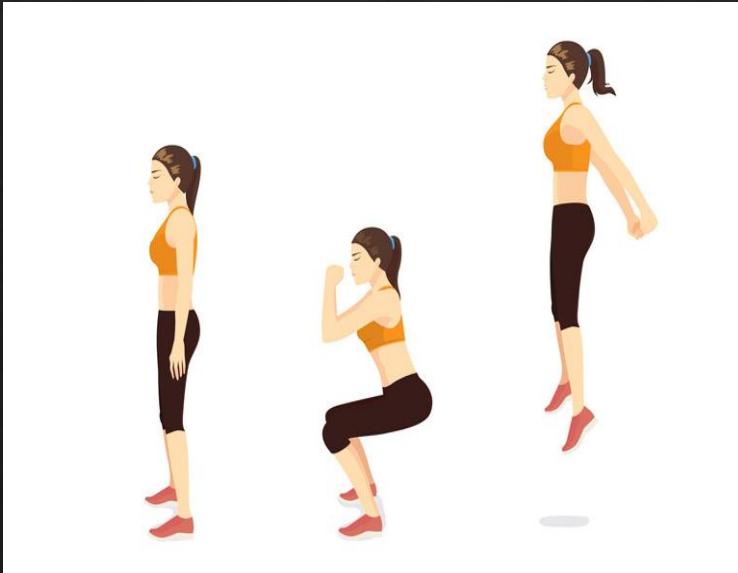
Plyometric exercises involve **rapid (brze) concentric and eccentric contractions (koncentrične i egzcentrične kontrakcije)** of a muscle.

Most of these exercises involve a type of **explosive (eksplozivan pokret)** or **jumping movement (skakački pokret)**.



# Plyometric Exercise

Examples of plyometric exercises are jump squats (skakački čučnjevi), box jumps (skokovi na kutiju), and burpees (kombinacija skleka, čučnja i skoka).

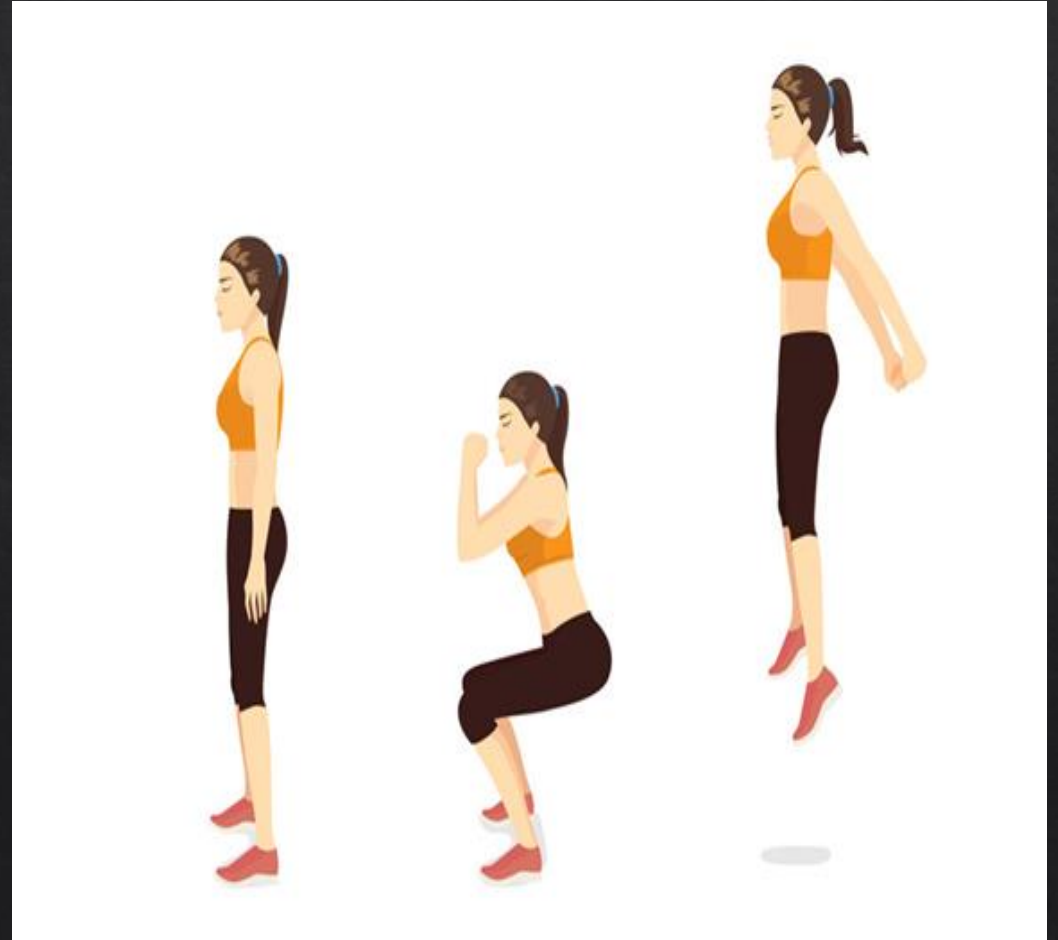




# Plyometric Exercise

A jump squat involves an explosive concentric and eccentric contraction to allow you to jump up and squat down.

\*Plyometric exercises can positively impact one's coordination.



# Why should I know all of this?

Understanding the information on resistance exercise can be highly useful in real-life situations, especially for individuals aiming to improve their overall fitness and well-being.





# Here's how this knowledge can be applied:

## 1. Personalized Workout Routines:

Individuals can design personalized workout routines based on their fitness goals.

If someone wants to enhance muscular endurance, what type of exercises would you recommend they do?

## 2. Rehabilitation and Recovery:

What type of exercises are an excellent starting point for those recovering from surgery?

## 3. Safe and Effective Training for Specific Conditions:

Individuals with balance or coordination issues may benefit from using which exercise machines?



## 4. Enhanced Athletic Performance:

What type of exercises can a basketball player incorporate to improve explosive movements and coordination on the court?



## 5. Accessible and Cost-Effective Resistance Options:

Remember the example with the canned goods?



Thank you for your  
attention!