

Development of innovative training solutions in the field of functional evaluation aimed at updating of the curricula of health sciences schools



MODULE BIOMECHANICS FOUNDATIONS

Didactic Unit A: MOVEMENTS



CLASS INDEX

- Understanding differences between Kinematics and Kinetics variables
 - Understanding the concept of acceleration
-
- **Class workshop**
Movement planes

Understanding differences between Kinematics and Kinetics

Kinematics and Kinetics variables



Kinematics

- Kinematics describes the motion of a body.

Kinematics answer the questions about **how** a body moves.

Kinetics

- Kinetics describes the forces that act over a body to produce movement.

Kinetics answer the questions about **why** a body moves.

<https://ocw.mit.edu/courses/physics/8-01sc-classical-mechanics-fall-2016/week-1-kinematics/week-1-introduction/>

The following variables related to the movement of a body belong to kinematic or kinetic analysis?
Energy, acceleration, power, ground reaction force, velocity, position, work, angle



Understanding the concept of acceleration

ACCELERATION AND VELOCITY



- Acceleration is the rate of change of velocity. It means that in the case that the velocity does not change, the acceleration is equal to zero.

Are you sure that you have understood the relationship between acceleration and velocity?



Understanding the concept of acceleration



ACCELERATION AND VELOCITY

Match the following statements:

	<i>High velocity, low acceleration</i>	<i>High velocity, high acceleration</i>	<i>Low velocity, low acceleration</i>	<i>Low velocity, high acceleration</i>
A car accelerating at maximum after red traffic lights				
A car driving by a school area at a low, almost constant velocity				
A car at high velocity and try to overtake another car increasing its velocity				
A car at a stable and high velocity				

Activity extracted from: <https://es.khanacademy.org/science/physics/one-dimensional-motion/acceleration-tutorial/a/acceleration-article?modal=1>

Understanding the concept of acceleration



ACCELERATION AND VELOCITY

Match the following statements:

	<i>High velocity, low acceleration</i>	<i>High velocity, high acceleration</i>	<i>Low velocity, low acceleration</i>	<i>Low velocity, high acceleration</i>
A car accelerating at maximum after red traffic lights				X
A car driving by a school area at a low, almost constant velocity			X	
A car at high velocity and try to overtake another car increasing its velocity		X		
A car at a stable and high velocity	X			

Activity extracted from: <https://es.khanacademy.org/science/physics/one-dimensional-motion/acceleration-tutorial/a/acceleration-article?modal=1>

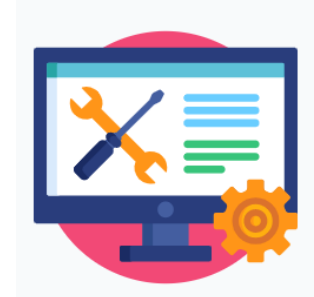
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Movement planes

WORKSHOP



Objective:

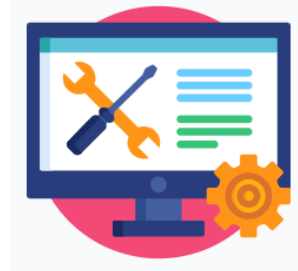
- To determine the movements planes and axis of the three movements proposed.

Instructions:

- Forming working groups.
- One of the students plays the role of an anatomical model.
- First movement: From position 1, perform shoulder internal-external rotations without separating the elbow from the trunk.
- Second movement: From position 1, perform forearm pronation and supination.
- Third movement: From position 2, perform shoulder internal-external rotations.

Movements planes

WORKSHOP



Position 1



Position 2

Movements planes

WORKSHOP



Solution:

- First movement:
Plane: Horizontal
Axis: Lateral and Anteroposterior
- Second movement:
Plane: Frontal
Axis: Lateral and Vertical
- Third movement:
Plane: Sagittal
Axis: Vertical and Anteroposterior



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