

SINTESI DEL PROGETTO

Scuola/e	Liceo Linguistico “G.Cesare-M.Valgimigli”, Rimini
Autori	Oriella Soggia-Giorgio Analdi
Titolo del modulo	NEWTON’S LAWS
classe	3 rd year liceo linguistico
livello linguistico	B1+
obiettivi disciplinari	Comprensione delle leggi della dinamica
contenuti disciplinari	Le tre leggi di Newton, , Aristotele VS Galilei, sistemi inerziali
punto del programma (eventuali prerequisiti)	Cinematica: descrizione dei moti
numero di ore	10
materiale	Fotocopie, websites, spago, palloncini, cannuce, scotch.
bibliografia	Caforio Ferilli “Physics” Le Monnier / Anzola Borracci “ Physics Mechanics” Zanichelli
supporti	Lim, laboratorio linguistico.
compresenza (SI/NO)	No

DESCRIZIONE DEL PROGETTO

Il progetto consiste nel presentare le leggi della dinamica mediante

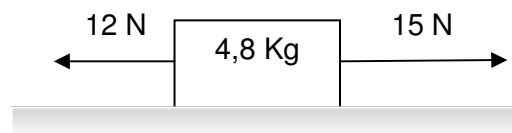
- attività mirate alla ricerca lessicale dei termini specifici della disciplina
- visione di video in cui semplici esperimenti di carattere qualitativo mostrano le leggi di Newton cui sono soggetti
- cooperative learning
- realizzazione di un semplice esperimento

CLIL lesson 1	<ul style="list-style-type: none"> • NEWTONIAN DYNAMICS. From the description of motion to its causes. CLIL Activity 1: VOCABULARY-FORCE <p>http://goo.gl/Fxa3oc</p> <p>http://goo.gl/2iQzxG</p>
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CLIL lesson 2	Correcting homework. CLIL Activity 2: Matching. Galileo versus Aristotele: Galileo's inclined planes. The inertia.
CLIL lesson 3	The first law of motion. CLIL Activity 4: Watching video “Newton in space” and listening. http://goo.gl/rK7Ne4
CLIL lesson 4	The second law of motion. Listening CLIL Activity 6: Watching video “Newton in space” and listening. Filling the gaps.
CLIL lesson 5	The second law of motion $F=ma$; $a=F/m$; $m=F/a$. Exercise bob sleigh and proportionality between F-m-a with examples.
CLIL lesson 6	Correcting homework.
CLIL lesson 7	3rd law of motion experiment with balloons. https://www.youtube.com/watch?v=THzwMoDT_Kc https://www.youtube.com/watch?v=IVjxBmxalg
CLIL lesson 8	3rd law of motion with examples and Exercise penguins.
CLIL lesson 9	Correcting homework exercises. Application of the principles of dynamics $P = mg$, Difference between mass and weight. Final Mind map.
CLIL lesson 10	CLIL lesson 10: Newton's laws classwork.

SOME EXERCISES:

- 1) Look at the picture:



Find out the acceleration (magnitude and direction) of the object.

- 2) Determine the acceleration that results when a 12-N net force is applied to a 3-Kg object.

- 3) A 5.20-N force is applied to a 1.05-kg object to accelerate it rightwards across a friction-free surface. Determine the acceleration of the object. (Neglect air resistance.)
- 4) A 5.20-N force is applied to a 1.05-kg object to accelerate it rightwards. The object encounters 3.29-N of friction. Determine the acceleration of the object. (Neglect air resistance.)
- 5) Big Bubba has a mass of 100 kg on the Earth. What is Big Bubba's mass on the Moon where the force of gravity is approximately 1/6-th that of Earth's?
- 6) A 630-Kg car is slowing down with a $17,6\text{-m/s}^2$ deceleration. Find out the magnitude of the net force applied to the car.
- 7) A player pushes a bowling ball with a 60-N force. The ball gets an acceleration of $8,75\text{ m/s}^2$. What is the ball mass?

Penguins cannot fly and walk awkwardly, but they move on the ice fields of Antarctica by sliding on their stomachs and paddling with their wings.



Lying on their stomachs, two penguins push against each other. The larger penguin, which has mass of 40.5 kg exerts a horizontal force of 80.4 N on the smaller one, which has mass 22.4 kg. Assuming negligible friction with the ice, how much do each of the two penguins accelerate?