UANL

VISIÓN UANL 2040

La excelencia por principio la educación como instrumento

PORTFOLIO OF EVIDENCES

EXTRAORDINARY 2° OPPORTUNITY

THE SCIENCE OF MOTION

Student name: _____

Group: _____

Student ID: _____ Date: _____

Teacher: _____

The present portfolio is part of 50% of your grade. This value will be obtained as long as it meets the following requirements:

1. Write your complete identification data.
2. The portfolio must be delivered person as a requirement the day of the exam.

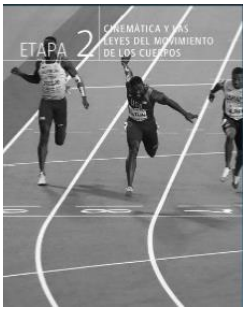
FOLLOW THE INSTRUCTIONS PROVIDED BY YOUR TEACHER FOR THE COMPLETION OF THIS PORTFOLIO

¡¡¡WARNING!!!

Plagiarisms and trade of academic material contained in this portfolio will be punished under the terms of the University Legislation.

THE SCIENCE OF MOTION

EVIDENCE PORTFOLIO
EXTRAORDINARY OPPORTUNITY



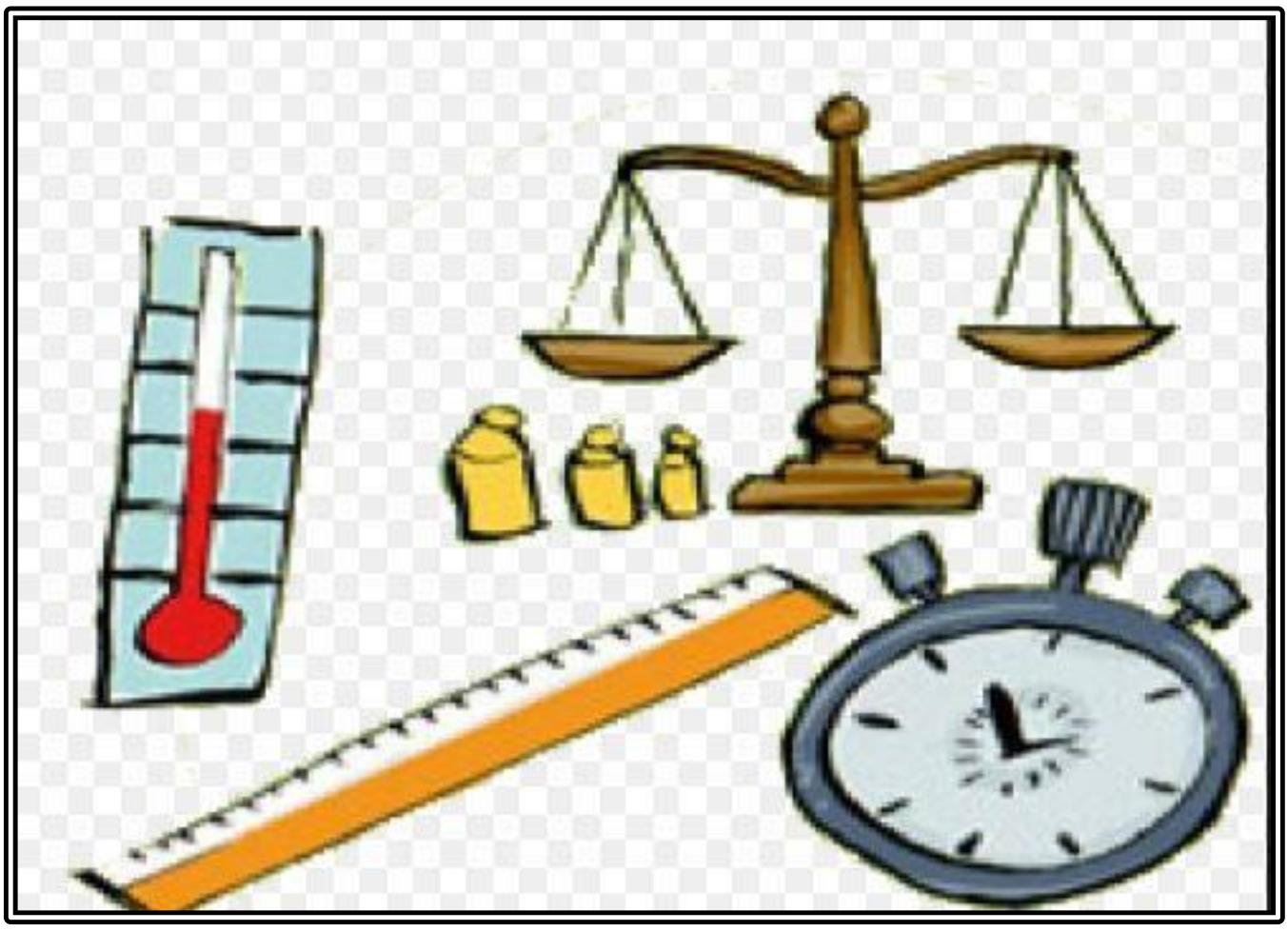
This portfolio is part of 50% of your rating. This value will be obtained as long as the following requirements are met:

1. **Full identification details.**
2. **The portfolio solution will be in blue ink and by hand, remember that the complete procedures are requested.**
3. **The portfolio is complete and correct.**
4. **Take photo of each sheet, to make a WORD document, to convert it later to PDF.**
5. **This portfolio must be uploaded to TEAMS in PDF format, on the day and time indicated by the teacher in the TASKS section of the equipment corresponding to the subject.**
6. **PLEASE VERIFY CORRECT PORTFOLIO SUBMISSION AND ADD YOUR NAME ON EACH SHEET.**

Student Name:	
Group:	
Teacher name:	

STAGE 1:

PHYSICAL, THE SCIENCE OF MEASUREMENTS



STAGE 1: PHYSICAL, THE SCIENCE OF MEASUREMENTS

Dimensions: Recovery, Understanding, Analysis and Application
INSTRUCTIONS: Briefly answer each of the following reagents.

1. Science studying nature, matter and energy and the relationships between the two:	
2. It is the branch of Physics that describes the movement of the bodies	
3. It is the branch of physics that studies the behavior of light, its characteristics and its manifestations.	
4. Study the circulation and transfer of energy and heat and describe how energy instills movement or performs work.	
5. Quantum physics, relativity atomic physics are branches of...	
6. It is a branch of Physics that studies and unifies electrical and magnetic phenomena in a single theory	
7. It is a branch of interdisciplinary physics that studies sound, infrasound and ultrasound, that is, mechanical waves that propagate through matter (both solid and liquid or gaseous) (they do not propagate in a vacuum) by means of physical and mathematical models.	
8. It is a term associated with some property or some measurable characteristic and has a representation in the real world.	
9. Physical quantities that do not depend on any other physical quantity, their measurement is direct.	
10. It is a numerical value that is obtained as a result of making a comparison of the physical magnitude of the object to be measured with the corresponding measurement standard	
11. Physical quantity that has magnitude, direction, and meaning.	
12. The distance, mass, time, temperature, electrical current, etc. are examples of quantities:	
13. An example of a derived unit is:	
14. It is the comparison of one physical property or magnitude to another of the same class (unit of measure)	
15. This is the duration of 9,192,631,770 cycles of radiation associated with the transition between two levels of a cesium atom	
16. Instrument used to measure mass	
13. It is the length of the path traveled by light in a vacuum for a time of 1/299 792 458 of a second,	
14. Classification of physical magnitudes according to directional properties	

15. These quantities are fully defined when their magnitude (number and unit of measurement) is provided	
16. Physical quantity that has magnitude, direction, and meaning.	
17. Using trigonometric functions, what is the expression for finding the vector component on the x-axis?	
18. Using trigonometric functions, what is the expression for finding the vector component on the y-axis?	
19. If we have the rectangular coordinates, the mathematical tool that helps us find the magnitude of the RESULTING vector, is ...	
20. And the function that helps us find the direction of the vector in sexagesimal degrees, to have the polar coordinates of the vector is ...	
21. Method used to add two or more vectors and you want to find the effect of all those vectors.	
22. Is the name given to the vector representing the sum of two or more vectors	

STAGE 1: PHYSICAL, THE SCIENCE OF MEASUREMENTS (PROBLEMS)

INSTRUCTIONS: Solve the following problems:
MAKE SURE YOUR PROCEDURES ARE CLEAR AND CONSISTENT, DO NOT FORGET THE UNITS IN THE RESULT.

1. 30 m/s to km/h

2. 36 km/hr to m/s

3. A 4.4 km copper wire is used to make driving clips with a length of 2.2 cm that are used in car harnesses how many clips are produced?

4. Transform the polar coordinate to rectangular coordinates F= 160N θ = 130º

5. Transform rectangular coordinates to polar coordinate Fx = 600N Fy = 600N

6. Find the resulting vector (magnitude and direction) of the following force vectors:
V_1= 135N θ_1= 45° V_2 = 175N θ_2= 120°.

CHECKLIST FOR STAGE 1		
ENDPOINT	**YES**	**NO**
1. Stage exercises are complete		
2. Theory responses are clear and leave no doubt (good letter)		
3. Problems present data with units in SI		
4. The formula (mathematical model) to be used is correct		
5. In problems, procedures are clear		
6. Problem results have requested units		

STAGE 2.

KINEMATICS AND THE LAWS OF MOTION OF BODIES

Dimensions: Recovery, Understanding, Analysis and Application
INSTRUCTIONS: Briefly answer each of the following reagents.

1. Branch of Physics that studies the movement of bodies:	
2. Change of position in space over time of a body, with respect to other bodies	
2. Branch of mechanics that studies the movement of bodies according to their mathematical description and graphic analysis	
3. Study the movement of bodies according to the causes that produce it and their changes	
5. It is the model that considers that the mass is concentrated at a point from where changes in space and time are analyzed	
6. It is the set of points in the space occupied by the body successively during the change of position	
7. Scalar quantity representing the actual length of the path followed by the body	
8. Vector quantity representing the change in position of a mobile from a start point to an end point in a straight line:	
9. Scalar quantity that is defined as the division of the total distance traveled by a mobile by the total time:	
10. Vector quantity that is defined as the division of the total displacement of a mobile and the total time:	
11. It is the change in the speed of a body in relation to the time at which said change occurs	
13. These are the acceleration units in SI	
14. Type of forces that are due to the attraction that exists between two bodies due to their masses and the distance that separates them.	
14. Property of bodies to resist a change in their motion or state of rest.	
15. Defined as the quantitative measure of inertia, inherent property of a body.	
16. Any agent capable of producing a change in the state of movement of a body or a deformation thereof	
17. Unit of force of the SI and which is defined as the force applied to a mass of 1 kg produces an acceleration of 1 m/s^2	
19. Forces whose origin is in a property possessed by particles: electric charge	
20. Forces originating from the components of the nucleus of atoms	
21. Attractive force exerted by the Earth on bodies that are on or near its surface	
22. "Every body will remain at rest or with uniform rectilinear movement, unless an external force is applied to change it."	
23. "If a body is under the action of a net force other than zero, then the acceleration produced is directly proportional to the force applied and inversely proportional to the mass of the body"	
24. Mathematical expression representing Newton's Second Law	
26. "To every force of action corresponds another force of equal magnitude, but in the opposite direction called reaction."	

27. Based on the Aristotelian conception, he is considered to have developed a model known as Geocentric Theory	
28. He proposed in the 16th century a model with the Sun as the center of the planetary system, called Heliocentric Theory	
29. "The planets move in elliptical-shaped orbits around the Sun and these occupy a focus of the ellipse"	
30. "The imaginary straight line linking a planet to the sun covers equal areas at equal time intervals."	
31. "Two bodies of any kind attract each other with a force that is directly proportional to the product of their masses and inversely proportional to the square of the distance between them."	
32. Mathematical expression representing the "Law of Universal Gravitation"	
34. Mathematical expression to calculate g (gravitational acceleration) using Earth's mass and Earth's radius, for a body on Earth's surface	

STAGE 2: KINEMATICS AND THE LAWS OF MOTION OF BODIES (PROBLEMS)

INSTRUCTIONS: Solve the following problems:
(REMEMBER TO INCLUDE THE STEPS: DATA, FORMULA, SUBSTITUTION AND RESULT WITH UNITS)

1. A person moves 200 m to the north and then 300 m to the south, all in a time of 20 min. Determine:
A. The total distance
B. Displacement

2. A 900 kg car starts from rest and after 5 seconds goes a speed of 144 km/h. Calculate the following statements:
A. The acceleration of car
B. The distance traveled by the car
C. The weight of the car on Earth
D. The weight of the car on the Moon (g=1.6 m/s2)
E. How is the weight of the car on Earth compared to the weight on the Moon?
F. How is the mass of the car on Earth compared to the mass on the Moon?
G. The total force that moves the car

3. If the mass of the Earth is $6x10^{24}$ kg and its radius is 6400km. The approximate gravitational force of attraction on an 80kg mass, placed on its surface, is:

CHECKLIST FOR STAGE 2		
ENDPOINT	**YES**	**NO**
1. Stage exercises are complete		
2. Theory responses are clear and leave no doubt (good letter)		
3. Problems present data with units in SI		
4. The formula (mathematical model) to be used is correct		
5. In problems, procedures are clear		
6. Problem results have requested units		

STAGE 3.

LAWS, PRINCIPLES and CONCEPTS RELATED TO MOVEMENT

STAGE 3.

LAWS, PRINCIPLES AND CONCEPTS RELATED TO MOVEMENT

Dimensions: Recovery, Understanding, Analysis and Application
INSTRUCTIONS: Briefly answer each of the following reagents.

1. It is the product of the magnitude of the force (F) by the magnitude of the displacement (x) both in the same direction, through which the force acts by the cosine of the angle(θ) that exists between the force and the displacement.	
2. It is the mathematical expression of the work	
3. Units used for Work in the SI	
4. Defined as work performed on the time unit, or how quickly a job is performed	
5. Mathematical expression that allows to calculate the Power	
6. These are the units of Power in SI	
7. It is the equivalent in watts for a horsepower (HP)	
8. In Physics, it is the ability to perform a job	
9. These are the SI units for energy	
10. It is the energy that a body possesses by virtue of its movement	
11. It is the mathematical expression to calculate the kinetic energy of a moving body	
12. It is the energy that a body possesses by virtue of its position at a reference level with respect to the gravitational field	
13. It is the mathematical expression to calculate the potential energy of a body	
14. "Energy is not created or destroyed, it can only change shape, but the total amount before the transformation is exactly equal to the total amount of energy after it"	
15. It is the sum of the kinetic energy and the potential energy of a body in a given position.	
16. It is the product of the mass (m) of a body by its velocity (v) and is represented by the letter p	
17. Mathematical expression to calculate the amount of movement of a body	

18. SI Units for Movement Quantity	
19. It is the product of the application of a force for the time interval during which it is applied	
20. Math Expression to Calculate Impulse	
21. SI units for impulse	
22. We define it as the change in the amount of movement of a body	
23. Expression relating impulse (F . Δt) with the amount of movement	
24. "The sum of the amounts of movement of the bodies, before a crash, is equal to the sum of the amounts of movement of those bodies after the crash"	
25. These are shocks where, in addition to complying with the law of conservation of the amount of movement, the law of conservation of energy is also complied with	
26. These are shocks where the amount of movement before and after the shock is conserved, but the mechanical energy is not conserved	

STAGE 3. LAWS, PRINCIPLES AND CONCEPTS RELATED TO MOVEMENT (PROBLEMS)

INSTRUCTIONS: Solve the following problems:
(REMEMBER TO INCLUDE THE STEPS: DATA, FORMULA, SUBSTITUTION AND RESULT WITH UNITS)

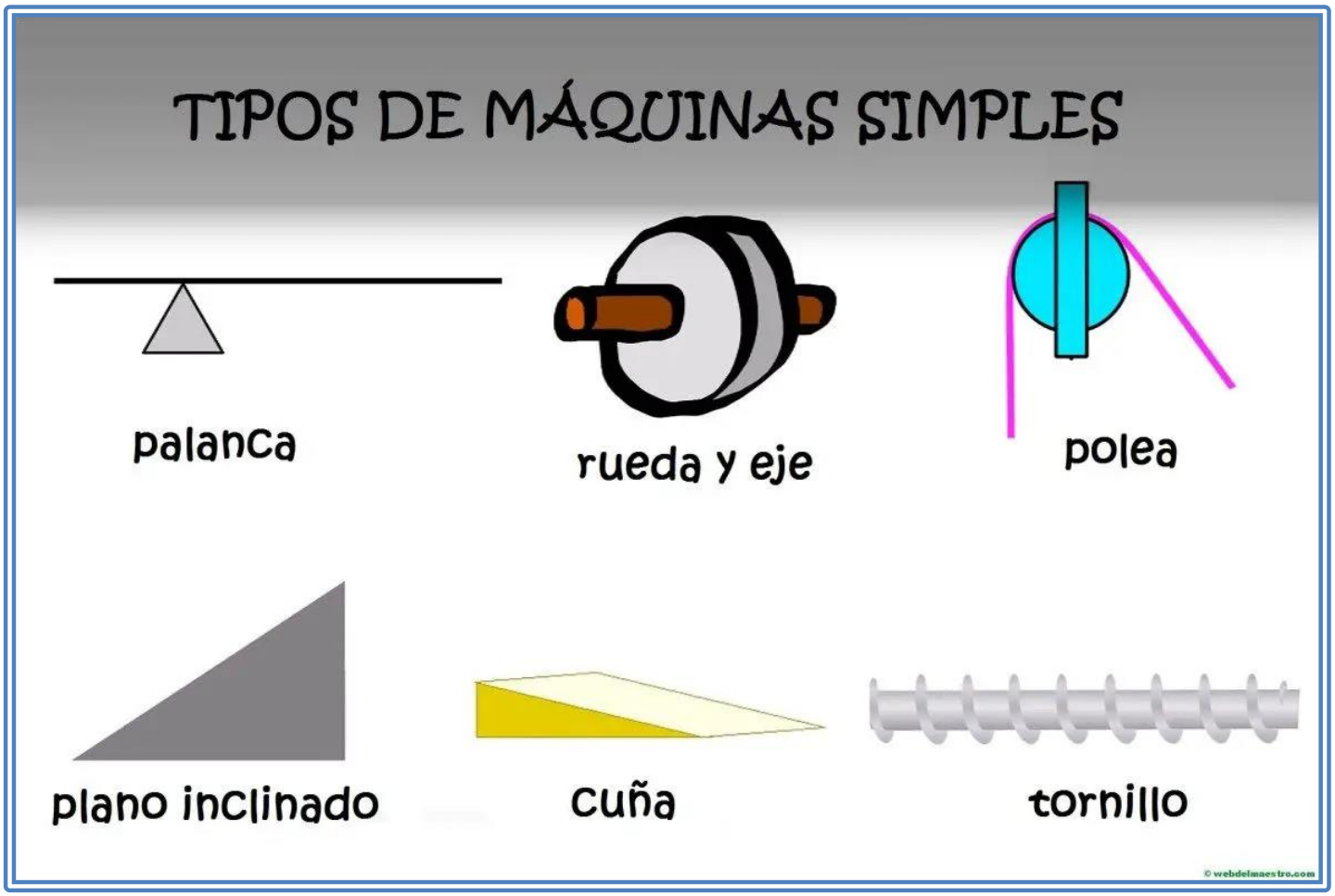
1. A person applies a horizontal force of 400N, to push a desk 35m above the floor in ¼ of a minute. Find:
a) The work done by the force of the person.
b) Power in watts
c) Power in horsepower

2. An electric motor produces a force of 880N on a drag chain whose speed is uniform at 3m/s. Calculate power in Hp.

4. A 650g basketball drops from rest from a height of 122.5m. Determine:
a) The mechanical energy at the beginning of the fall.
b) Mechanical energy in the middle of the fall
c) Mechanical energy when reaching the floor
d) The height and speed when reaching the floor

CHECKLIST FOR STAGE 3		
ENDPOINT	**YES**	**NO**
1. Stage exercises are complete		
2. Theory responses are clear and leave no doubt (good letter)		
3. Problems present data with units in SI		
4. The formula (mathematical model) to be used is correct		
5. In problems, procedures are clear		
6. Problem results have requested units		

STAGE 4.
MACHINES, AN APPLICATION OF THE PRINCIPLES AND LAWS OF MOTION



MACHINES, AN APPLICATION OF THE PRINCIPLES AND LAWS OF MOTION

Dimensions: Recovery, Understanding, Analysis and Application
INSTRUCTIONS: Briefly answer each of the following reagents.

1. It is a device that transforms an input force into an output force that is usually of greater magnitude and of opposite direction, its fundamental objective being to facilitate the work	
2. It consists of basic elements: an input force (man) the apparatus or device (consisting of a single element) and the output force, usually the movement of a heavy body.	
3. It is a machine that uses systems of two or more simple machines	
4. It is the name of the lever's fulcrum	
5. This is the name given to the input force on a lever	
6. This is the name given to the output force on a lever	
7. It is the distance between the fulcrum and the point where the power force is applied	
8. It is the distance between the fulcrum and the point where it applies the resistance force	
9. Lever where fulcrum is between power force and resistance force	
10. Mathematical expression for resolving lever exercises	
11. Is the relationship between the power arm and the resistance arm	
12. It is defined as the relationship between the resistance force and the power force	
13. It is obtained as a percentage and is the ratio between the actual mechanical advantage and the ideal mechanical advantage	
14. It is a simple machine in which a flat surface forms an acute angle with the horizontal (floor) forming an elevation that allows lifting or lowering objects	
15. It is the relationship between the slope length and the sloped plane height	
16. It is the ratio between the weight of the load and the force applied to raise the load	
17. The performance or efficiency of the inclined plane is given by…	

18. It is a simple machine consisting of a drum to which a rope is wound and which rotates around an inserted shaft which is attached to a crank whose arm is longer than the diameter of the cylinder	
19. It is a system formed by a grooved wheel and a wheel that moves through that channel	
20. It is the expression for the ideal mechanical advantage of the pulley	

STAGE 4. MACHINES, AN APPLICATION OF THE PRINCIPLES AND LAWS OF MOTION (PROBLEMS)

INSTRUCTIONS: Solve the following problems:
(REMEMBER TO INCLUDE THE STEPS: DATA, FORMULA, SUBSTITUTION AND RESULT WITH UNITS)

1. A person will move a rock of 2500N with a lever and is placed (the person) 3.5m from the fulcrum or fulcrum, while the rock is 35cm from the fulcrum.
a) What force should the person apply?
b) Calculate the ideal mechanical advantage
c) Calculate actual mechanical advantage
d) Determine efficiency or performance

2. A box weighing 4800N is pushed onto an inclined plane 16m long and 2.5m high with a force of 1400N.
a) Calculate the ideal mechanical advantage
b) Calculate the actual mechanical advantage
c) Determines efficiency or performance

CHECKLIST FOR STAGE 4		
ENDPOINT	**YES**	**NO**
1. Stage exercises are complete		
2. Theory responses are clear and leave no doubt (good letter)		
3. Problems present data with units in SI		
4. The formula (mathematical model) to be used is correct		
5. In problems, procedures are clear		
6. Problem results have requested units		

Realized: MEM. Mario Arturo Rodríguez Rosales (Academy Coordinator)

Approved: Academy Members

Checked: Lic. Andrea Yarelli Salas Alejandro (Class Development and Support Area)

Validated: ME. Nancy Elvira Tenorio Garza (Academic Secretary)