PORTAFOLIO DE EVIDENCIAS

2DA OPORTUNIDAD EXTRAORDINARIA

THE SCIENCE OF MOTION

Nombre del estudiante: _____

Matrícula: _____ **Grupo:** _____

Docente: _____

Fecha: _____

El presente portafolio forma parte del 50% de tu calificación. Este valor se obtendrá siempre y cuando cumpla con los siguientes requisitos:

1.Escribe tus datos de identificación completos.

2.Adjunta el portafolio en la Plataforma Ms Teams en formato PDF, el día y hora que el docente asigne la tarea correspondiente a la segunda oportunidad; no olvides agregar tu nombre completo en cada hoja.

3.Verifica el envío correcto del portafolio.

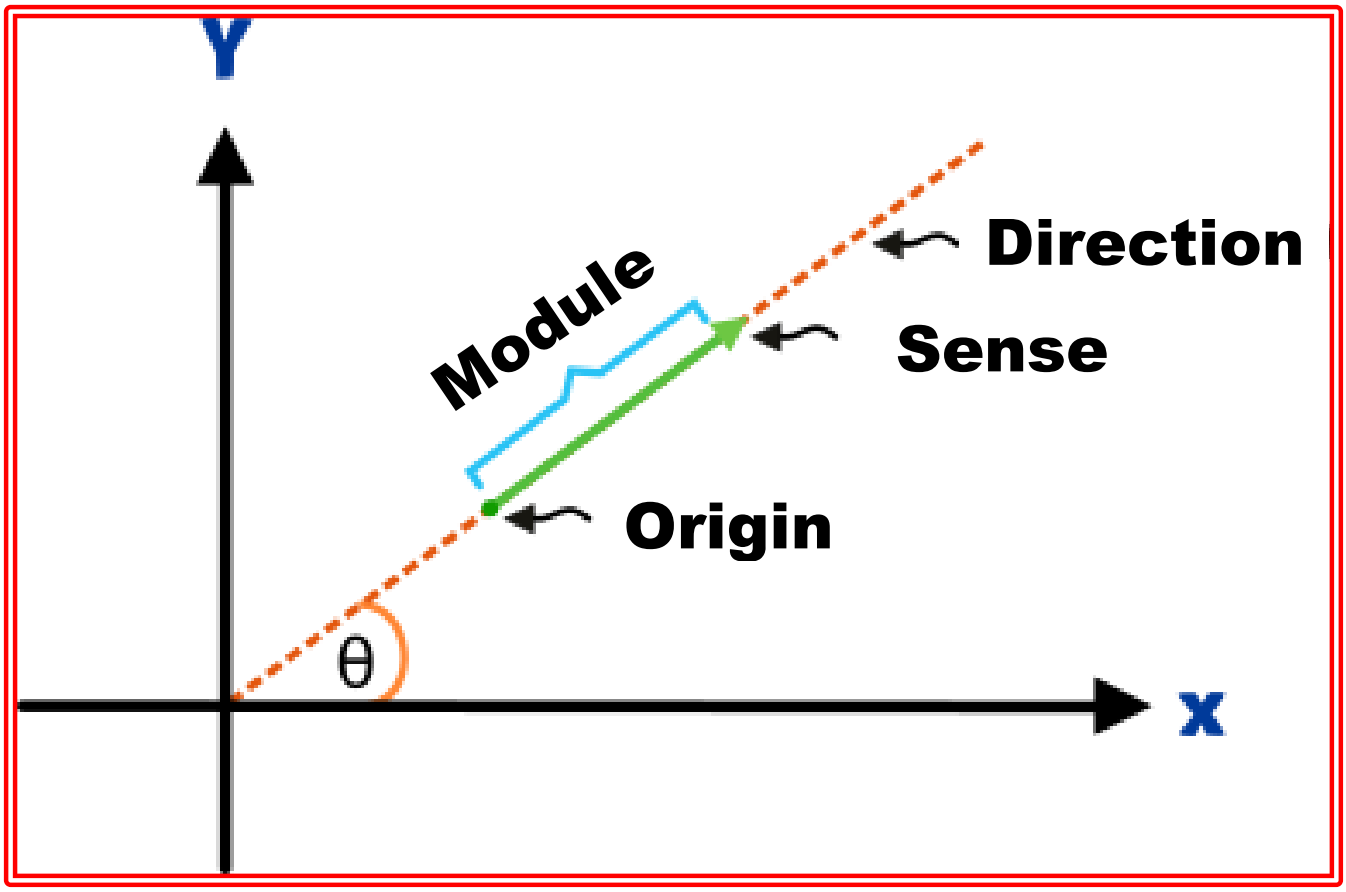
SIGUE LAS INSTRUCCIONES BRINDADAS POR TU MAESTRO PARA EL LLENADO DE ESTE PORTAFOLIO.

¡ADVERTENCIA!

El plagio y comercio de material académico contenido en este portafolio será sancionado en los términos de la Legislación Universitaria.

STAGE 1:

PHYSICS, THE SCIENCE OF MEASUREMENTS



""The mind is like a parachute. It only works if we keep it open"
(A. Einstein)

STAGE 1: PHYSICS, THE SCIENCE OF MEASUREMENTS

Dimensions: Retrieval, Comprehension, Analysis and Application
INSTRUCTIONS: Briefly answer each of the following items.

1. The science that studies matter and energy in nature and the relationships that exist between them:	
2. It is the branch of Physics that describes the motion of bodies.	
3. It is the branch of physics that studies the behavior of light, its characteristics and its manifestations.	
4. It studies the circulation and transfer of energy and heat and describes how energy infuses motion or does work.	
5. Quantum physics, relativity and 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, i.e. 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 everything that can be measured and has a real-world representation.	
9. Physical units that are arbitrarily selected and are not defined in terms of others.	
10. These quantities are fully defined when their magnitude (number and unit of measurement) is provided.	
11. A physical quantity that has magnitude, direction and sense.	
12. Distance, mass, time, temperature, electric current, etc., are examples of quantities:	
13. An example of a derived unit:	
14. It is the comparison of one physical property or magnitude with another of the same kind.	
15. It is the duration of 9 192 631 770 cycles of the radiation associated with the transition between two levels of a cesium atom.	
16. It is the length of the path traveled by light in a vacuum during a time of 1/299 792 458 of a second, based on the fact that the speed of light in a vacuum is exactly 299 792 458 meters/second.	
17. Classification of physical quantities according to directional properties.	
18. These quantities are fully defined when their magnitude (number and unit of measurement) is given.	

19. A physical quantity having magnitude, direction and direction.	
20. Using trigonometric functions, what is the expression for finding the component of the vector on the x-axis?	
21. Using trigonometric functions, what is the expression for finding the component of the vector in the y-axis?	
22. If we have the rectangular coordinates, the mathematical tool that helps us to find the magnitude of the RESULTANT vector is	
23. And the function that helps us to find the direction of the vector in sexagesimal degrees, to have the polar coordinates of the vector, is ...	
24. Method that is used to add two or more vectors and you want to find the effect of all these vectors.	
25. The name given to the sum of two or more vectors.	

STEP 1: PHYSICS, THE SCIENCE OF MEASUREMENTS (PROBLEMS)

INSTRUCTIONS: Solve the following problems:

SEE TO IT THAT YOUR PROCEDURES ARE CLEAR AND CONSISTENT, DO NOT FORGET THE UNITS IN THE RESULT.

1. 40 m/s a km/h

2. 36 km/hr a m/s

3. A 4.6 km copper wire is used to make conduction clips with a length of 2.3 cm that are used in car harnesses how many clips are produced?

4. Transform the polar coordinate to rectangular coordinates F= 160N $\theta = 120^{o}$.

5. Transform the rectangular coordinates to polar coordinates Fx = -650N Fy = 600N

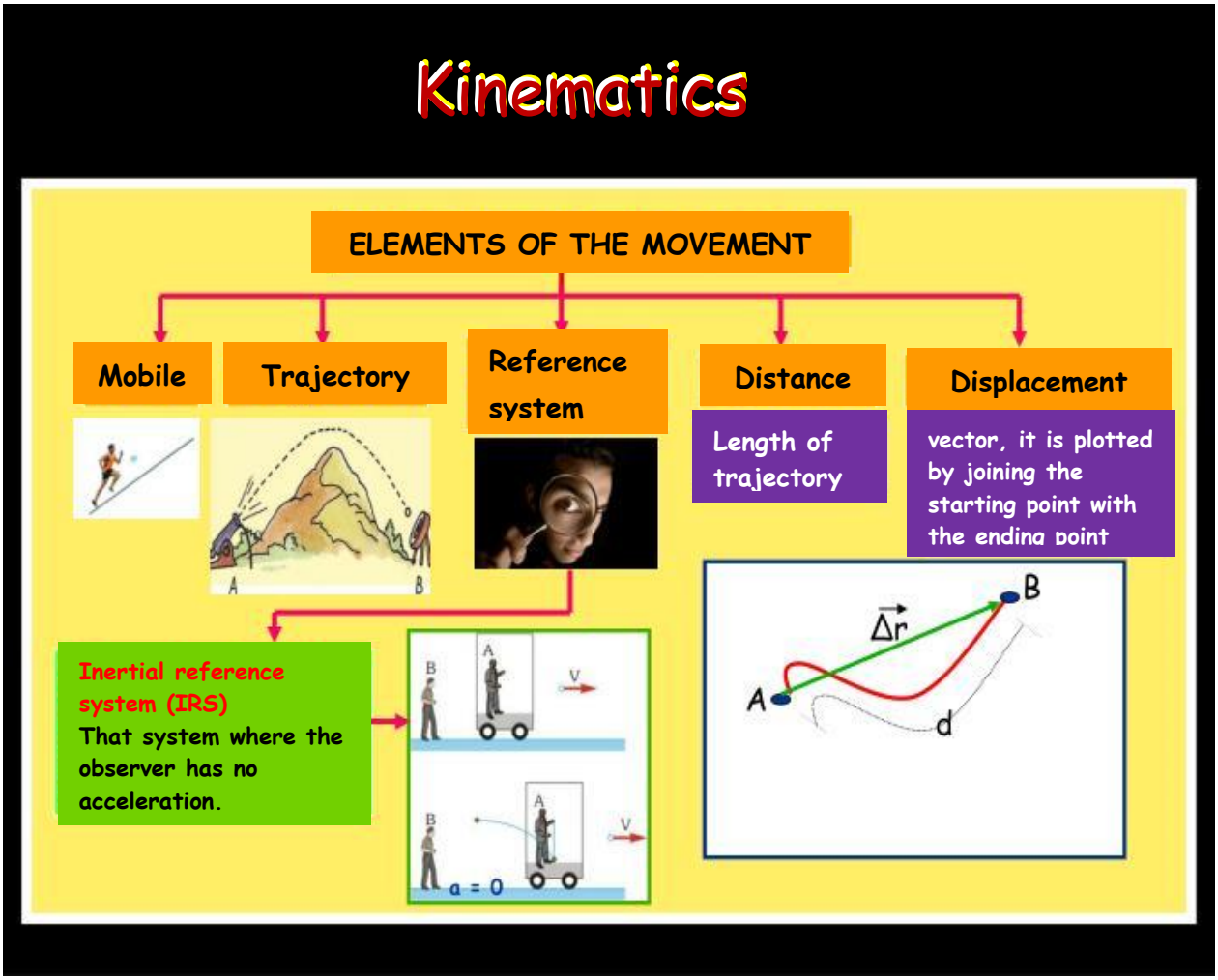
6. Find the resultant vector (magnitude and direction) of the following force vectors:
V1= 135N θ1= 40° V2 = 175N θ 2= 12

"Science is a way of thinking, and not so much an aggregate of knowledge."
(Carl Sagan)

CHECKLIST FOR STAGE 1		
EVALUATION CRITERIA	**YES**	**NO**
1. The stage exercises are complete.		
2. Theory answers are clear and leave no room for doubt (good handwriting)		
3. The problems present the data with SI units		
4. The formula (mathematical model) to be used is correct.		
5. In the problems, the procedures are clear		
6. The results of the problems have the requested units.		

STAGE 2.

KINEMATICS AND THE LAWS OF MOTION OF THE BODIES.



“Let us not pretend that things change, if we always do the same thing.”

(A. Einstein)

STAGE 2. KINEMATICS AND THE LAWS OF MOTION OF BODIES

Dimensions: Retrieval, Comprehension, Analysis, and Application.
INSTRUCTIONS: Briefly answer each one of the following questions

1. The branch of physics that studies the motion of bodies:	
2. branch of mechanics that studies the motion of bodies by attending to their mathematical description without considering the causes that produce or modify it.	
3. It studies the motion of bodies by considering the causes that produce or modify it:	
4. A scalar quantity that represents the magnitude of the length of the real trajectory that a mobile travels.	
5. Vector quantity that represents the change in position of a mobile from an initial point to an end point in a straight line:	
6. A scalar quantity that is defined as the division of the total distance traveled by a mobile by the total time:	
7. Vector quantity that is defined as the division of the total displacement of a mobile and the total time:	
8. Name of the motion that a body has when it follows the trajectory of a straight line and travels equal distances in equal times:	
9. It is the place or point from which we can determine the motion of the object we wish to analyze.	
10. In physics, all the mass of the body will be concentrated in a point, therefore, body, object or point are the same as:	
11. Type of forces that are due to the attraction that exists between two bodies due to their masses and the distance that separates them.	
12. Type of forces that are exerted between electrically charged particles.	
13. Type of forces that occur in the nucleus of atoms.	
14. The property of bodies to resist a change in their motion or state of rest.	
15. Defined as the quantitative measure of inertia, a property inherent in a body.	
16. The force of attraction exerted by the earth on bodies.	
17. "Any body at rest or in uniform motion will remain at rest or with velocity it is carrying unless an external force is applied to it."	
18. "The acceleration of a body is directly proportional to the force applied and inversely proportional to the mass."	
19. The formula F=ma is an expression of the:	
20. "To every force of action there corresponds a force of reaction of equal magnitude, but of opposite direction".	

21. Unit of force of the international system and is defined as the force that applied to a mass of 1 kg produces an acceleration of 1 m/s².	

STEP 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 travels 200 m to the west and arrived 300 m to the south, all in a time of 20 min. Calculate:
A. The total distance
B. The displacement

2. A 900 kg car starts from rest and after 5 seconds goes a speed of 40 m/s. Calculate the following statements:
A. The acceleration of the car
B. The weight of the car on Earth
C. The weight of the car on the Moon (g=1.6 m/s2).
D. How is the weight of the car on Earth compared to the weight on the Moon?
E. How is the mass of the car on Earth compared to the mass on the Moon?
F. The total force moving the car

3. If the mass of the Earth is 6x1024 kg and its radius is 6400km. The approximate gravitational force of attraction on a mass of 80kg, placed on its surface, is:

"Perseverance can transform failure into extraordinary achievement."
(Matt Biondi)

CHECKLIST FOR STAGE 1		
EVALUATION CRITERIA	**YES**	**NO**
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2. Theory answers are clear and leave no room for doubt (good handwriting)		
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4. The formula (mathematical model) to be used is correct.		
5. In the problems, the procedures are clear		
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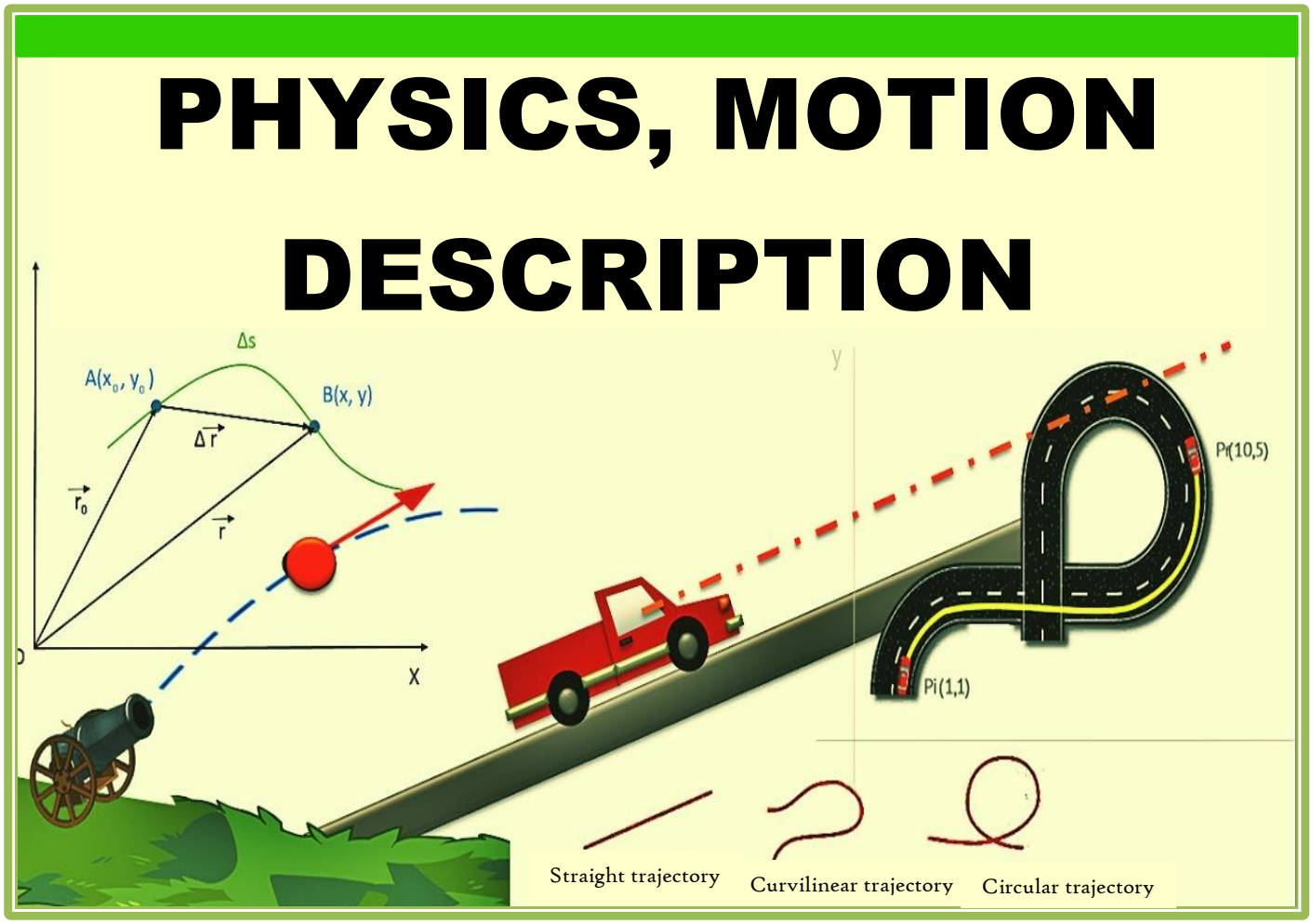
STAGE 3.

LLAWS, PRINCIPLES AND CONCEPTS RELATED TO MOVEMENT



“It doesn't matter how slowly you go as long as you don't stop.”

(Confucius)

STAGE 3. LAWS, PRINCIPLES AND CONCEPTS RELATED TO MOVEMENT

Dimensions: Retrieval, Comprehension, Analysis, and Application.
INSTRUCTIONS: Briefly answer each of the following items.

1. It is the product of the magnitude of the force (F) times the magnitude of the displacement (x) both in the same direction, through which the force acts times 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. It is defined as the work done in a unit of time, or the speed with which work is done.	
5. Mathematical expression used to calculate Power	
6. The SI units of power	
7. It is the equivalence in watts for a horsepower (HP).	
8. In Physics, it is the capacity to do work.	
9. It is the SI units for energy	
10. It is the energy possessed by a body by virtue of its motion.	
11. It is the mathematical expression for calculating the kinetic energy of a body in motion.	
12. The energy possessed by a body by virtue of its position at a reference level with respect to the gravitational field.	
13. It is the mathematical expression for calculating the potential energy of a body.	
14. "Energy is neither created nor destroyed it can only change form, but the total amount before the transformation, is exactly equal to the total amount of energy after the transformation."	
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 it is represented by the letter p	
17. A mathematical expression for calculating the amount of motion of a body.	
18. SI units for quantity of motion	

19. The product of the application of a force times the time interval during which the force is applied.	
20. Mathematical expression for calculating momentum	
21. SI units for impulse	
22. We define it as the change in the amount of motion of a body.	
23. Expression relating the impulse (F . Δt) to the quantity of motion.	
24. "The sum of the quantities of motion of the bodies, before a collision, is equal to the sum of the quantities of motion of those bodies after the collision"	
25. These are the collisions in which, in addition to the law of conservation of the quantity of motion, the law of conservation of energy is also fulfilled.	
26. These are the collisions in which the quantity of motion is conserved before and after the collision, but the mechanical energy is not conserved.	

STAGE 3. LAWS, PRINCIPLES AND CONCEPTS RELATED TO MOTION (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 minute. Find:
(a) The work done by the person's force.
b) The power in watts
c) The power in horsepower

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

4. A 650g basketball falls from rest from a height of 122.5m. Calculate:
(a) The mechanical energy at the start of the fall.
b) The mechanical energy at the middle of the fall.
c) The mechanical energy when it reaches the ground

"There is no substitute for hard work."
(Thomas Edison)

CHECKLIST FOR STAGE 1		
EVALUATION CRITERIA	**YES**	**NO**
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4. The formula (mathematical model) to be used is correct.		
5. In the problems, the procedures are clear		
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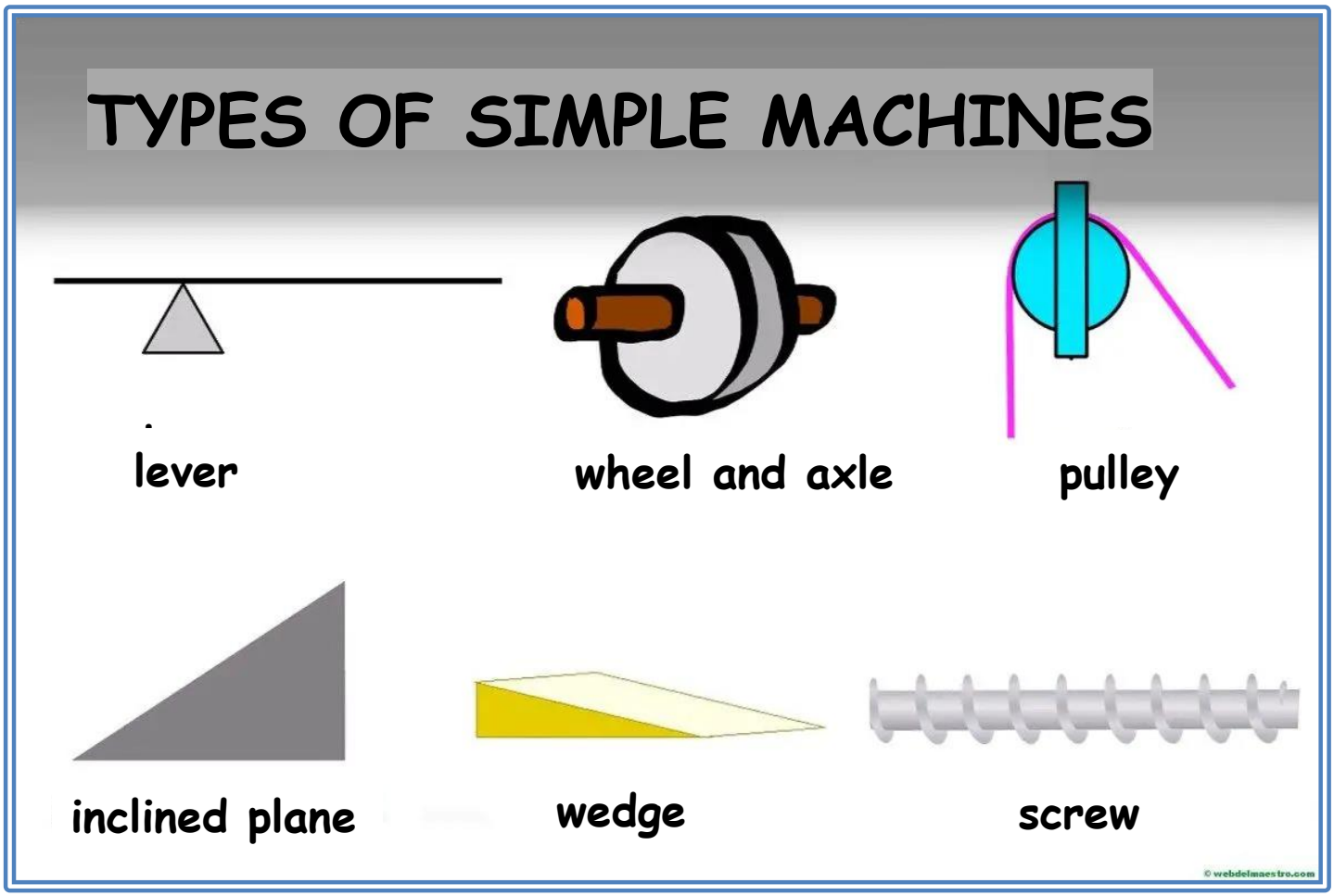
STAGE 4.
MACHINES, AN APPLICATION OF THE PRINCIPLES AND LAWS OF MOTION



"Energy and persistence conquer all things."
(Benjamin Franklin)

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

Dimensions: Retrieval, Comprehension, Analysis, and Application.
INSTRUCTIONS: Briefly answer each of the following items.

1. It is a device that transforms an input force into an output force that is usually of greater magnitude and in the opposite direction, its main 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. is a machine that uses systems of two or more simple machines.	
4. Is the name of the fulcrum of the lever.	
5. Is the name given to the input force on a lever.	
6. It 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 the resistance force is applied.	
9. Lever where the fulcrum is located between the power force and the resistance force.	
10. Mathematical expression to solve leverage exercises.	
11. The relationship that exists 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 of the actual mechanical advantage to the ideal mechanical advantage.	
14. It is a simple machine in which a flat surface forms an acute angle with the horizontal (ground) forming an elevation that allows raising or lowering objects.	
15. It is the ratio between the length of the slope and the height of the inclined plane.	
16. It is the ratio between the weight of the load and the force applied to lift the load.	
17. El rendimiento o la eficiencia del plano inclinado viene dado por…	
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. A system consisting of a grooved wheel and a wheel that moves along the groove.	
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 is going to move a 2500N rock with a lever and stands (the person) 3.5m from the fulcrum or fulcrum point, while the rock is 35 cm from the fulcrum.
a) What force should the person apply?
b) Calculate the ideal mechanical advantage
c) Calculate the actual mechanical advantage
d) Determine the efficiency or yield

2. A box weighing 4800N is pushed on 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) Determine the efficiency or performance

CHECKLIST FOR STAGE 1		
EVALUATION CRITERIA	**YES**	**NO**
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4. The formula (mathematical model) to be used is correct.		
5. In the problems, the procedures are clear		
6. The results of the problems have the requested units.		

"Eighty percent of success is based simply on insisting."
(Woody Allen)

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