

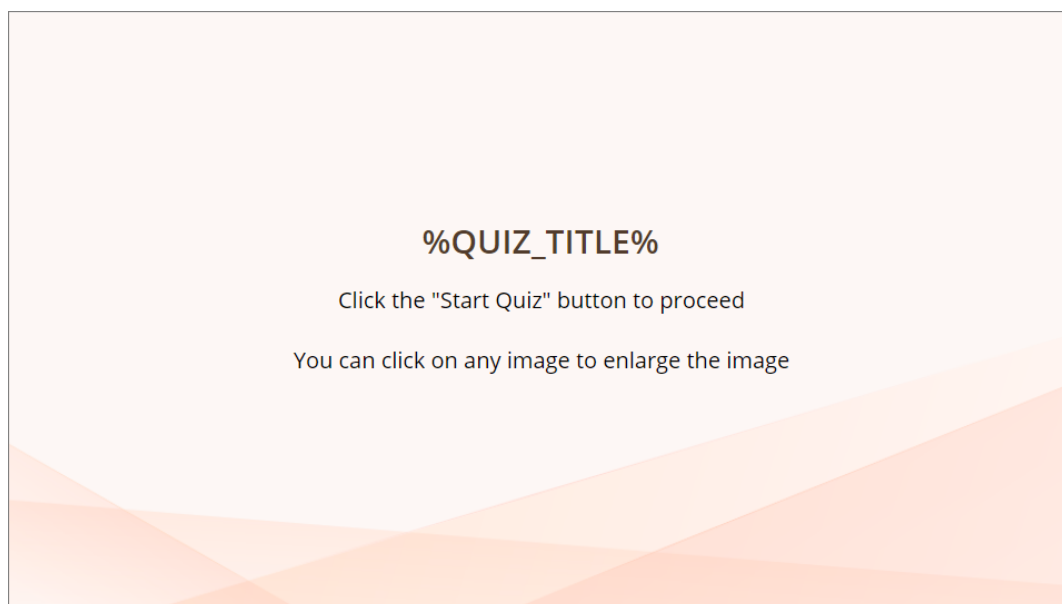
A-Level Physics Revision : Power and Energy

Document created: 02.14.2021 07:24

Quiz Settings

Setting	Value
Passing score:	50%
Total number of questions:	10
Number of questions to ask:	10
Answer submission:	Submit one question at a time
Number of quiz retries:	None
When quiz is finished:	Show slide with results
Send quiz results to instructor:	mjovery@yahoo.com
Send quiz results to user:	No

Intro Slide



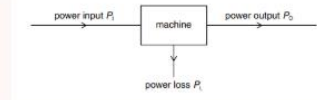
%QUIZ_TITLE%
Click the "Start Quiz" button to proceed
You can click on any image to enlarge the image

Question Group 1 (10/10 questions)

Question 1. Multiple Choice, 10 points, 1 attempt

Power is transferred through a machine as shown. What is the efficiency of the machine ?

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- $\frac{P_i}{P_i + P_L}$
- $\frac{P_L}{P_i}$
- $\frac{P_L}{P_o}$
- $\frac{P_o}{P_i}$

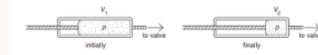
Correct	Choices
	$\frac{P_i}{P_i + P_L}$
	$\frac{P_L}{P_i}$
	$\frac{P_L}{P_o}$
V	$\frac{P_o}{P_i}$

Feedback	
Correct:	That's right! You chose the correct response.
Incorrect:	You did not choose the correct response. The efficiency. The power lost is irrelevant here. (Useful Power Out)/(Power IN) =

Question 2. Multiple Choice, 10 points, 1 attempt

A piston compresses a gas from a volume V_1 to V_2 at constant pressure P . The work one on the gas will be

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- $p (V_1 + V_2) / 2$
- $p (V_1 + V_2)$
- $p (V_1 - V_2)$
- $p V_1$

Correct	Choices
	$p (V_1 + V_2) / 2$
	$p (V_1 + V_2)$
V	$p (V_1 - V_2)$
	$p V_1$

Feedback	
Correct:	That's right! You chose the correct response.
Incorrect:	You did not choose the correct response. The work done in compressing an ideal gas, at constant pressure, is equal to the (pressure x change in volume)

Question 3. Multiple Choice, 10 points, 1 attempt

A trolley runs from P to Q along a track. At Q its potential energy is 50 kJ less than at P. At P, the kinetic energy of the trolley is 5 kJ. Between P and Q the work the trolley does against friction is 10 kJ. What is the kinetic energy of the trolley at Q?

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- 35 kJ
- 45 kJ
- 55 kJ
- 65 kJ

Correct	Choices
	35 kJ
V	45 kJ
	55 kJ
	65 kJ

Feedback

Correct: That's right! You chose the correct response.

Incorrect: You did not choose the correct response. Had there not been any energy loss the loss of PE would have equalled the gain of KE. However there is a loss of 10 kJ to the surroundings, so the KE = initial KE + 40 kJ = 45 kJ

Question 4. Multiple Choice, 10 points, 1 attempt

To travel at a constant speed, a car engine provides 24 kW of useful power. The driving force on the car is 600 N. At what speed does it travel?

To travel at a constant speed, a car engine provides 24 kW of useful power. The driving force on the car is 600 N. At what speed does it travel?

- 2.5 ms⁻¹
- 4.0 ms⁻¹
- 25 ms⁻¹
- 40 ms⁻¹

Correct	Choices
	2.5 ms ⁻¹
	4.0 ms ⁻¹
	25 ms ⁻¹
V	40 ms ⁻¹

Feedback	
Correct:	That's right! You chose the correct response.
Incorrect:	You did not choose the correct response. (Power = Force x velocity) , so rearrange formula to calculate velocity = 24000/600

Question 5. Drag the Words, 10 points, 1 attempt

Drag and drop the words to their places:

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Work is done on an object when a force moves an object in the direction of the force and is given by the product of the force and the distance moved in the direction. The formula is $W = F \times d$ where F is the applied force and d is the moved in the of the force. In the case of an ideal gas being compressed at a constant pressure, the work done to compress the gas is equal to the multiplied by the change in of the gas. Work is measured in the same units as energy. Work is measured in if the force is in and the distance moved is measured in .

distance direction pressure volume joules newtons metres

Text with Blanks

Work is done on an object when a force moves an object in the direction of the force and is given by the product of the force and the distance moved in the direction. The formula is $W = F \times d$ where F is the applied force and d is the [**distance**] moved in the [**direction**] of the force. In the case of an ideal gas being compressed at a constant pressure, the work done to compress the gas is equal to the [**pressure**] multiplied by the change in [**volume**] of the gas. Work is measured in the same units as energy. Work is measured in [**joules**] if the force is in [**newtons**] and the distance moved is measured in [**metres**]

Feedback	
Correct:	That's right! You chose the correct response.
Incorrect:	You did not choose the correct response.

Question 6. Drag the Words, 10 points, 1 attempt

Drag and drop the words to their places:

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The of a device is a measure of how much of the energy is transferred as output energy . The formula is given by Efficiency = (Useful Energy OUT)/ (Total Energy IN) . The difference between the useful energy out and the total energy will be the energy converted into other, unwanted forms. This is usually known as energy.

Text with Blanks

The [**efficiency**] of a device is a measure of how much of the [**input**] energy is transferred as [**useful**] output energy . The formula is given by Efficiency = (Useful Energy OUT)/ (Total Energy IN) . The difference between the useful energy out and the total energy [**supplied**] will be the energy converted into other, unwanted forms. This is usually known as [**wasted**] energy.

Feedback

Correct: That's right! You chose the correct response.

Incorrect: You did not choose the correct response.

Question 7. Multiple Choice, 10 points, 1 attempt

What is the expression used to define power ?

What is the expression used to define power ?

- Energy Out/Energy In
- Energy x Time taken
- Force x Velocity
- Work done / Time taken

Correct	Choices
	Energy Out/Energy In
	Energy x Time taken
	Force x Velocity
V	Work done / Time taken

Feedback	
Correct:	That's right! You chose the correct response.
Incorrect:	You did not choose the correct response. The definition for power is the rate of working or work done/time taken .

Question 8. Multiple Choice, 10 points, 1 attempt

Car X is travelling at half the speed of car Y. Car X has twice the mass of car Y. Which statement is correct ?

Car X is travelling at half the speed of car Y. Car X has twice the mass of car Y. Which statement is correct ?

- Car X has half the kinetic energy of car Y.
- Car X has one quarter of the kinetic energy of car Y.
- Car X has twice the kinetic energy of car Y.
- The two cars have the same kinetic energy.

Correct	Choices
V	Car X has half the kinetic energy of car Y.
	Car X has one quarter of the kinetic energy of car Y.
	Car X has twice the kinetic energy of car Y.
	The two cars have the same kinetic energy.

Feedback	
Correct:	That's right! You chose the correct response.
Incorrect:	You did not choose the correct response. 1/2 the speed reduces the KE by a factor of 1/4 since KE is proportional to the square of the speed . Twice the mass increases the KE by a factor of 2, since KE is directly proportional to the mass. So $1/4 \times 2 = 1/2$. Therefore the overall change is by a factor of 1/2

Question 9. Multiple Choice, 10 points, 1 attempt

A motorist travelling at 10 m s^{-1} can bring a car to rest in a braking distance of 10m. In what distance could the motorist bring the car to rest from a speed of 30 m s^{-1} using the same braking force ?

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17 m

30 m

52 m

90 m

Correct	Choices
	17 m
	30 m
	52 m
V	90 m

Feedback	
Correct:	That's right! You chose the correct response.
Incorrect:	You did not choose the correct response. The braking distance depends on the Kinetic Energy ! If the speed of the car goes up by a factor of 3, then the Kinetic Energy, and hence the braking distance will go up by a factor of 3^2 or 9 . (The KE is proportional to the square of the speed of the car)

Question 10. Multiple Choice, 10 points, 1 attempt

An old-fashioned 60 W lamp converts 95% of its energy supply into heat. A 4.0 W modern lamp has the same power output of light as the old-fashioned lamp. What is the efficiency of the modern lamp ?

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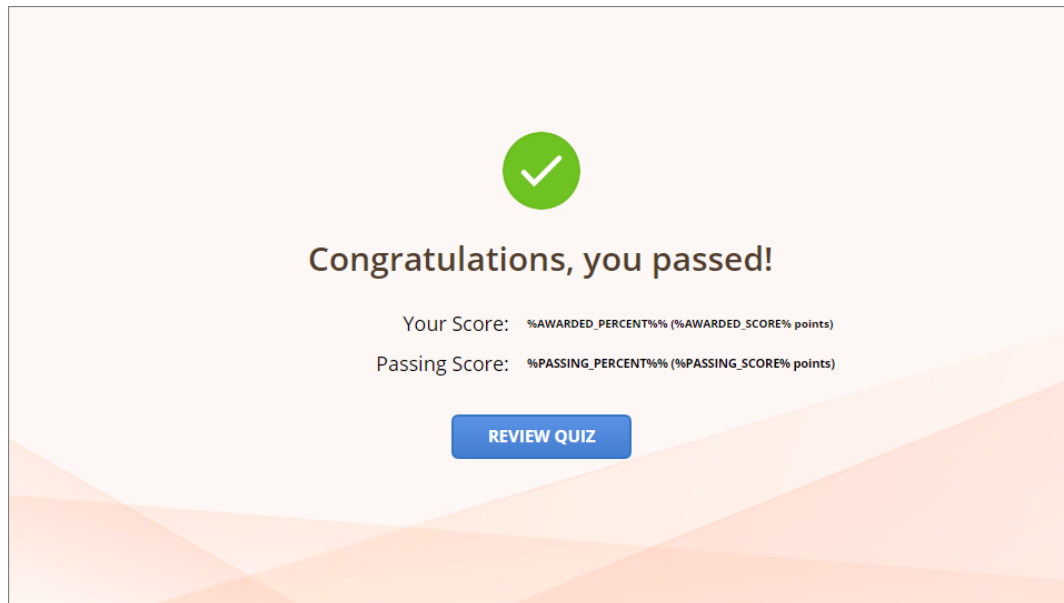
- 5.0%
- 6.7%
- 75%
- 95%

Correct	Choices
	5.0%
	6.7%
V	75%
	95%

Feedback	
Correct:	That's right! You chose the correct response.
Incorrect:	You did not choose the correct response. The old fashioned lamp converts only 5% of its input energy into light. So this gives an output of $(5 \times 60) / 100 = 3W$. The modern lamp efficiency is therefore $3/4$ or 75 %

Quiz Results

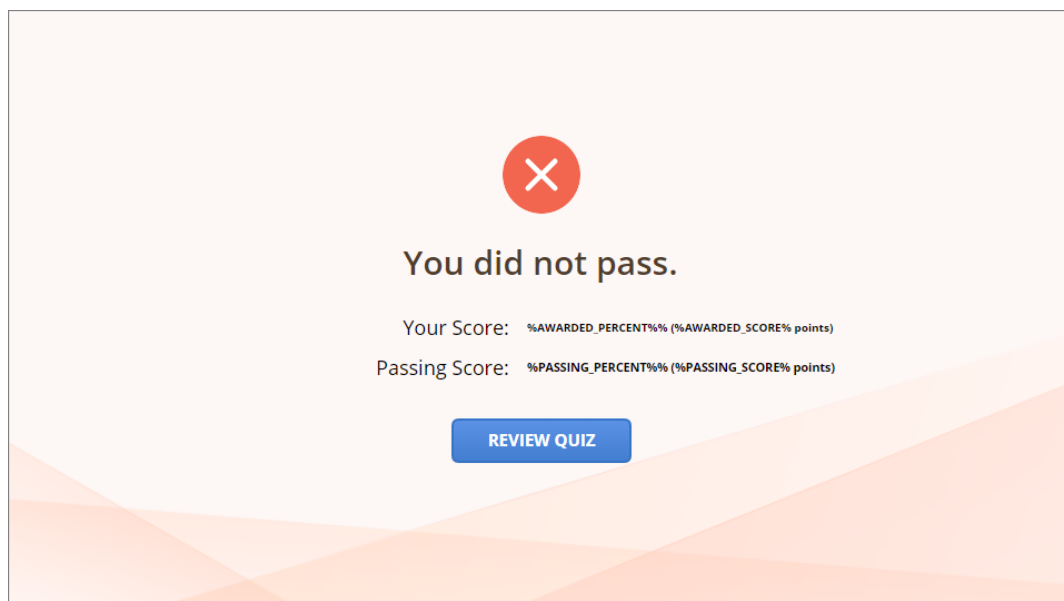
Quiz Results, Passed



A screenshot of a quiz results page for a passed quiz. At the top center is a green circle containing a white checkmark. Below it, the text "Congratulations, you passed!" is displayed in a bold, dark font. Underneath, two lines of text show "Your Score: %AWARDED_PERCENT%% (%AWARDED_SCORE% points)" and "Passing Score: %PASSING_PERCENT%% (%PASSING_SCORE% points)". At the bottom center is a blue button with the text "REVIEW QUIZ". The background features a light orange and white geometric pattern.

Congratulations, you passed!

Quiz Results, Failed



A screenshot of a quiz results page for a failed quiz. At the top center is a red circle containing a white 'X'. Below it, the text "You did not pass." is displayed in a bold, dark font. Underneath, two lines of text show "Your Score: %AWARDED_PERCENT%% (%AWARDED_SCORE% points)" and "Passing Score: %PASSING_PERCENT%% (%PASSING_SCORE% points)". At the bottom center is a blue button with the text "REVIEW QUIZ". The background features a light orange and white geometric pattern.

You did not pass.