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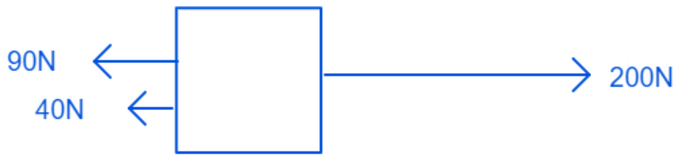
Newton's Laws:

1.11	describe the effects of forces between bodies such as changes in speed, shape or direction
1.12	identify different types of force such as gravitational or electrostatic
1.13	understand how vector quantities differ from scalar quantities
1.14	understand that force is a vector quantity
1.15	calculate the resultant force of forces that act along a line
1.16	know that friction is a force that opposes motion
1.17	know and use the relationship between unbalanced force, mass and acceleration: force = mass × acceleration $F = m \times a$



$\Delta F = 200 - 90 - 40 = 70N$ right

1st Law: a body remains at rest or at constant speed unless acted on by an unbalanced force.

State all the forces, which increase/decrease

Which are greater than others.

Discuss whether the net force is 0 or going in one direction or the other.

E.g. Explanation of terminal velocity:

1) As person is accelerating, downwards force of weight is greater than the upwards force of drag.

2) Unbalanced force acting downwards acts on person hence why they are accelerating downwards.

3) As velocity increases, drag increases, so acceleration decreases.

4) Because net force decreases (weight stays the same)

In other words downward force of weight stays the same, upwards force of drag increases, so downwards acceleration decreases.

5) Terminal velocity reached when downwards force of weight = upwards force of drag

6) So forces are balanced so by Newton's first law (...state it...) the skydiver travels at terminal velocity.

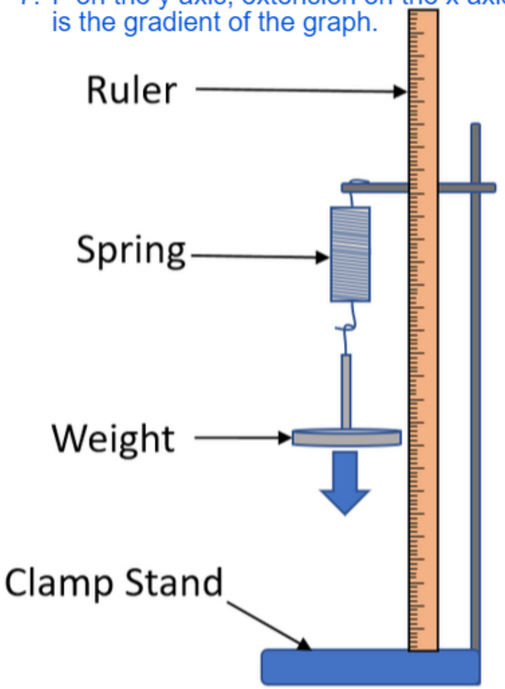
1.18	know and use the relationship between weight, mass and gravitational field strength: weight = mass × gravitational field strength $W = m \times g$
1.19	know that the stopping distance of a vehicle is made up of the sum of the thinking distance and the braking distance
1.20	describe the factors affecting vehicle stopping distance, including speed, mass, road condition and reaction time
1.21	describe the forces acting on falling objects (and explain why falling objects reach a terminal velocity)
1.22	*practical: investigate how extension varies with applied force for helical springs, metal wires and rubber bands*
1.23	know that the initial linear region of a force-extension graph is associated with Hooke's law
1.24	describe elastic behaviour as the ability of a material to recover its original shape after the forces causing deformation have been removed lesson 31

Experiment for determining the spring constant of a spring

1. Measure original length of the spring
2. Add at least 6 (known value) masses one at a time
3. Find extension using ruler
4. Plot results in table

F=kx

5. Draw graph of force against extension
6. If line is a straight line going through origin then the spring obeys Hooke's Law (**needed**).
7. F on the y axis, extension on the x axis and the spring constant is the gradient of the graph.



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(a) Units	
Students should:	
2.1	use the following units: ampere (A), coulomb (C), joule (J), ohm (Ω), second (s), volt (V) and watt (W)

(b) Mains electricity	
Students should:	
2.2	understand how the use of insulation, double insulation, earthing, fuses and circuit breakers protects the device or user in a range of domestic appliances
2.3	understand why a current in a resistor results in the electrical transfer of energy and an increase in temperature, and how this can be used in a variety of domestic contexts
2.4	know and use the relationship between power, current and voltage: power = current × voltage $P = I \times V$ and apply the relationship to the selection of appropriate fuses not given
2.5	use the relationship between energy transferred, current, voltage and time: energy transferred = current × voltage × time $E = I \times V \times t$ Given
2.6	know the difference between mains electricity being alternating current (a.c.) and direct current (d.c.) being supplied by a cell or battery

2.7	explain why a series or parallel circuit is more appropriate for particular applications, including domestic lighting
2.8	understand how the current in a series circuit depends on the applied voltage and the number and nature of other components
2.9	describe how current varies with voltage in wires, resistors, metal filament lamps and diodes, and how to investigate this experimentally

Series

Current is the same in all components.

Voltage is split between components.

Sum of the voltages adds up to the voltage of the cell.

Total resistance is equal to the sum of the resistances of the components.

$R_T = R_1 + R_2 + \dots$

Parallel

Voltage is the same across all branches.

Current is split between branches.

Total current is equal to the sum of the currents in each branch.

Total resistance is less than the resistance of each branch.

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2.9	describe how current varies with voltage in wires, resistors, metal filament lamps and diodes, and how to investigate this experimentally

Set up the circuit with a variable resistor.

Set up an ammeter in series. Voltmeter in parallel with the componnent you are measuring.

Vary the resistance of the variable resistor at set intervals e.g. 1 ohm each time.

Record the ammeter and voltmeter readings for each variable resistor setting.

Plot the results on a graph.

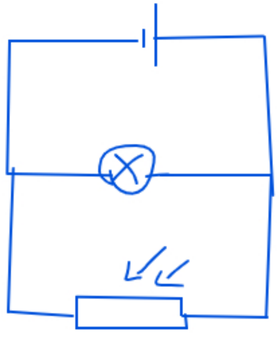
If the straight line going through the origin, then the component obey's Ohm's Law

2.10	describe the qualitative effect of changing resistance on the current in a circuit
2.11	describe the qualitative variation of resistance of light-dependent resistors (LDRs) with illumination and thermistors with temperature
2.12	know that lamps and LEDs can be used to indicate the presence of a current in a circuit
2.13	know and use the relationship between voltage, current and resistance: voltage = current × resistance $V = I \times R$
2.14	know that current is the rate of flow of charge
2.15	know and use the relationship between charge, current and time: charge = current × time $Q = I \times t$
2.16	know that electric current in solid metallic conductors is a flow of negatively charged electrons
2.17	understand why current is conserved at a junction in a circuit
2.18	know that the voltage across two components connected in parallel is the same
2.19	calculate the currents, voltages and resistances of two resistive components connected in a series circuit
2.20	know that: • voltage is the energy transferred per unit charge passed • the volt is a joule per coulomb
2.21	know and use the relationship between energy transferred, charge and voltage: energy transferred = charge × voltage $E = Q \times V$

LDR's as light intensity increases, resistance decreases negative light coefficient.

Thermistors as temperature increases resistance decreases.

Negative temperature coefficient (NTC) thermistor.



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Qualification overview

The Pearson Edexcel International GCSE in Physics consists of two externally-assessed papers:

- Physics Paper 1
- Physics Paper 2.

Content and assessment overview

Physics Paper 1	Paper codes 4PH1/1P and 4SD0/1P*
Externally assessed Written examination: 2 hours Availability: January and June First assessment: June 2019 110 marks	61.1% of the total International GCSE
Content summary Assesses core content that is **not** in bold and does not have a 'P' reference. Questions may come from any topic area across the specification. 1 Forces and motion 2 Electricity 3 Waves 4 Energy resources and energy transfers 5 Solids, liquids and gases 6 Magnetism and electromagnetism 7 Radioactivity and particles 8 Astrophysics	
Assessment A combination of different question styles, including multiple-choice questions, short-answer questions, calculations and extended open-response questions. A calculator may be used in the examinations.	

2.15	know and use the relationship between charge, current and time: charge = current × time $Q = I \times t$
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2.21	know and use the relationship between energy transferred, charge and voltage: energy transferred = charge × voltage $E = Q \times V$

(d)	**Electric charge**
Students should:	
2.22P	**identify common materials that are electrical conductors or insulators, including metals and plastics**
2.23P	***practical: investigate how insulating materials can be charged by friction***
2.24P	**explain how positive and negative electrostatic charges are produced on materials by the loss and gain of electrons**
2.25P	**know that there are forces of attraction between unlike charges and forces of repulsion between like charges**
2.26P	**explain electrostatic phenomena in terms of the movement of electrons**
2.27P	**explain the potential dangers of electrostatic charges, e.g. when fuelling aircraft and tankers**
2.28P	**explain some uses of electrostatic charges, e.g. in photocopiers and inkjet printers**

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Stuff to focus on:

3.8 explain why there is a change in the observed frequency and wavelength of a wave when its source is moving relative to an observer and that this is known as the Doppler effect 5 mark questions on Doppler effect

Look up the question: flashcard the mark scheme

Finding refractive index of glass block experiment: Look up in a paper and flashcard

Critical angle calculations, total internal reflection explanations.

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4 Energy resources and energy transfers

The following sub-topics are covered in this section.

(a) Units

(b) Energy transfers

(c) Work and power

(d) Energy resources and electricity generation

- energy transfers: mechanically, electrically, by heating, by radiation (light and sound)

Heat transfer questions, you should be talking about conduction, convection or radiation in almost every point you make.

... heat loss by conduction/convection/radiation reduced...

Convection explanation - 5 marks - flashcard.

Black and white colour - heat transfer explanations.

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5 Solids, liquids and gases

The following sub-topics are covered in this section.

(a) Units

(b) Density and pressure

(c) Change of state

(d) Ideal gas molecules

Pressure: Mention particles and particle collisions - look up these questions and flashcard common mark scheme phrases.

more particle collisions

collisions have more force

more frequent collisions

greater change in momentum so greater force for each collision

5.20	explain, for a fixed amount of gas, the qualitative relationship between: • pressure and volume at constant temperature • pressure and Kelvin temperature at constant volume
5.21	use the relationship between the pressure and Kelvin temperature of a fixed mass of gas at constant volume: $\frac{p_1}{T_1} = \frac{p_2}{T_2}$
5.22	use the relationship between the pressure and volume of a fixed mass of gas at constant temperature: $p_1V_1 = p_2V_2$

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6 Magnetism and electromagnetism

The following sub-topics are covered in this section.

(a) Units
(b) Magnetism
(c) Electromagnetism
(d) Electromagnetic induction

Flashcard all the questions and mark schemes from physics and maths tutor.

7 Radioactivity and particles

The following sub-topics are covered in this section.

(a) Units
(b) Radioactivity
(c) Fission and fusion

Make sure you can do your decay equations

Label and explain (control rods and moderator 3 mark explanations) all parts of nuclear reactor

5 mark questions on:

How a nuclear reactor works.

Fission process.

Fusion process.

Look up on pmt and flashcard.

Danger: how ionising the type of radiation is