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| **Topic heading** | **Syllabus Ref** | **Idea cluster** | **Question 1** | **Question 2** | **Question 3** | **Question 4** | **Question 5** | **Question 6** |
| **Energy** | **KS3P1a** | Energy transfers | When hot tea cools down we can say the following about energy:   1. The tea absorbs energy from the surroundings. 2. The surroundings absorb energy from the tea. 3. The surroundings transfer energy to the tea. 4. Energy is lost because the tea cools down. | There are two beakers containing the same volume of water. The temperature in one beaker is 20oC and the other is90oC. What is the most likely temperature after mixing:   1. 110oC 2. 90oC 3. 20oC 4. 50oC | Which is the best description of what is meant by a good thermal insulator?   1. A material that doesn’t allow thermal energy to move through it easily. 2. A material that doesn’t allow any thermal energy to move through it easily. 3. A material that doesn’t allow cold to move through it easily. 4. A material that does allow cold to move through it easily | Where is energy stored before and after burning a candle?   1. Before in the candle, after in the flame. 2. Before in the wick, after in the candle. 3. Before in the wick, after in the flame. 4. Before in the candle, after in the surroundings. | What happens at power stations?   1. Energy is made? 2. It makes hot water for our houses? 3. It transforms energy in fuels into electrical energy. 4. It transfers energy from fuels to our houses? | When a melon is dropped onto a pavement which of the following best describes what happens to energy?   1. The gravitational potential store reduces and the heat store of the surroundings increases. 2. The melons gains kinetic energy, which is lost when it hits the floor. 3. The melon’s energy store steadily reduces as it falls. 4. The gravitational potential store increases and the heat store of the surroundings increases. |
|  |  |  | B | D | A | D | C |  |
| **Energy** | **KS3P1b** | Efficiency of energy transfers | 1 nut transferred 500 Joules of energy when it was burned. This energy was used to heat a beaker of cold water. What is the most likely amount of energy that will be stored in the water?   1. 500oC 2. 500J 3. 400oC 4. 400J | When a battery-powered torch is switched on two processes occur. Which statement best describes these processes?   1. Useful heating and useful lighting. 2. Not useful heating and not useful lighting. 3. Not useful heating and useful lighting 4. Useful heating and not useful lighting | A group of students were testing crisps to measure their stored energy. They burned the crisps and used the energy to heat water. Which of the following heated the water most efficiently?   |  |  |  | | --- | --- | --- | |  | Energy in crisp | Energy in water | | A | 100J | 60J | | B | 100J | 45J | | C | 500J | 200J | | D | 500J | 250J | | Four people rode bikes up hill. In each case energy was transferred from the chemical store in the person to the gravitational potential store in the person and the bike. In which case was the rate of energy transfer greatest?   1. 400J were transferred in 40s 2. 200j were transferred in 10s 3. 300J were transferred in 10s 4. 300J were transferred in 20 s | In order to do work, energy is   1. transferred 2. used up 3. lost 4. lost or transferred | If 90J of energy goes into a torch and 50J is transferred by lighting, how much is transferred by heating?   1. 0 J 2. 40J 3. 50J 4. 90J |
|  |  |  | D | C | A | C | A | B |
| **Forces** | **KS3P2a** | Resultant forces | Which of the following statements is correct about the forces acting on a cup of tea and a pencil sitting on the same table?   1. The forces are the same in both. 2. The table pushes up more against the cup than the pencil. 3. The table pushes up more against the pencil than the cup. 4. There are no forces because the objects are still. | When in flight an aeroplane experiences a thrust force an uplift force, weight and air resistance.  Which of the following statements could be true?   1. The plane is stationary 2. The plane is slowing down but staying at the same height 3. The plane is moving at a steady speed and descending at a steady rate. 4. The plane is moving at a steady speed and accelerating upwards. | When a ball is suspended from a string what forces are acting on the ball:   1. Weight and string tension. 2. Weight and uphrust. 3. Weight and air resistance. 4. weight and gravity | Which one of the statements about air resistance is true?   1. It is the same in a vacuum and air. 2. It increases with speed but decreases with surface area. 3. It increases with surface area but decreases with speed. 4. It increases with speed and surface area. | A space rocket is in orbit around the moon and its engines are turned off. The only forces now acting upon the rocket are:   1. Thrust and air resistance. 2. Thrust only. 3. Weight only 4. Air resistance only |  |
|  |  |  | B | C | A | D | C |  |
|  | **KS3P2b** | Turning forces | Two weights hang at each end of a seesaw.  If the seesaw is in balance what can we say about the distances and forces?  d 2  d 1  F 2  F 1   1. d2 is bigger than d1 so F2 must be bigger than d1. 2. F1 + d1 = F2 + d2 3. The two forces will always be equal. 4. F1 x d1 = F2 x d2 | If the see saw below is perfectly balanced what is the value of the unknown value “X” ?  1.5 m  1 m  3 N  X   1. 4.5 m. 2. 4.5 N 3. 3.5 m 4. 3.5 N | A hanging Christmas mobile was made by hanging three stars from a piece of wood. the stars are identical and were spaced so they were perfectly balanced.  50 cm  30 cm  X cm  What must the distance X be if the mobile is perfectly balanced?   1. 30 cm 2. 20 cm 3. 50 cm 4. 10 cm | A force of 2N is applied to the end of a seesaw; the moment of force produced is 16 Nm. how far is the end of the seesaw from the pivot?   1. 32 N 2. 18 N 3. 8 N 4. 14 N | Door hinge is about 1.5 m away from handle, and a boy pushes the door handle with a force of 4 N. The moment of force will be:   1. 6 N m 2. 5.5 N m 3. 2.66 N m 4. 2.5 N m |  |
|  |  |  | D | B | B | C | A |  |
| **Waves** | **GCSEPWa 1** | Properties of waves | :::IS1Physics '02:Physics TESTS:wave.pct  Compared to wave A, which wave or waves have smaller amplitude?   1. waves B and C 2. wave B only 3. wave D only 4. waves B and D | :::IS1Physics '02:Physics TESTS:wave.pct  Which wave or waves has the highest frequency?   1. Wave A and B 2. Wave B and C 3. Wave C and D 4. Wave D and A | :::IS1Physics '02:Physics TESTS:wave2.gif  Which interval represents one full wavelength in the wave diagram above?   1. A to C 2. B to D 3. A to G 4. A to E | :::IS1Physics '02:Physics TESTS:wave2.gif  Which variable or variables in the wave equation (*v=fλ)* can not be measured from the wave diagram above?   1. frequency and speed 2. *frequency* 3. *wavelength and speed* 4. *speed* | :::IS1Physics '02:Physics TESTS:wave2.gif  The wave shown in the diagram has a frequency of 1000Hz and the distance from A to E is 10 m. What is the speed of the wave?   1. 100m/s 2. 10,000 m 3. 10,000m/s 4. 100m | A wave traveling at 5.0 x 104 meters per second has wavelength of 2.5 x 10-1 meters. What is the frequency of the wave?   1. 2 .0x 103 2. 7.5 x 10-4 3. 2.0 x 105 4. 7.5 x 104 |
|  |  |  | D | B | D | A | C | C |
|  | **GCSEPWa 2** | Reflection of waves | When light hits a boundary between two materials it is reflected if: | Which type of mirror causes light rays to reflect away from each other?   1. plain 2. convex 3. concave 4. All of the above | From which two combinations of mediums will light bend the most?   1. water to air 2. air to glass 3. glass to water 4. water to glass | Choose the word that completes the law of reflection that states : “the angle of incidence equals the angle of ………..”   1. normal 2. refraction 3. reflection 4. absorbence | When light is shone on an opaque object which of the following can not occur:   1. The light will transmit through the material. 2. The light will be absorbed 3. The light will be reflected and scattered 4. The light will be reflected | What is the line labelled X in the diagram above called?  X   1. The reflected rau 2. The incident ray 3. The refracted ray 4. The normal |
|  |  |  |  | D | B | C | A | D |
|  | **GCSEPWa 3** | Sound waves | Sound is an example of   1. A longitudinal wave. 2. A wave that can travel through a vacuum. 3. A transverse wave. 4. A wave that does not transmit energy. | The ear drum detects sound by:   1. Vibrating at a higher frequency than the sound wave that hits it. 2. Vibrating at a lower frequency than the sound wave that hits it. 3. Vibrating at the same frequency as the sound wave that hits it. 4. Vibrating at the same volume as the sound wave. | Humans can only hear sound waves within the frequency range   1. 20 Hz to 200 Hz 2. 20 Hz to 20 kHz 3. 20 m to 200 m 4. 20 m to 20 km | Dogs are able to hear higher pitched sounds than humans because   1. Dogs’ eardrums can detect louder sounds. 2. Human eardrums can detect higher frequencies. 3. Human eardrums are not sensitive enough to detect such quiet sounds. 4. Dogs’ eardrums are able to detect higher frequency sound waves. |  |  |
|  |  |  | A | C | B | D |  |  |
|  | **GCSEPWa 4** | Waves for detection and exploration | Ultrasound waves are   1. Have frequencies higher than 20 kHz and are used to measure the depth of water. 2. Have frequencies below 20 Hz and are used to measure the depth of water. 3. Have frequencies higher than the upper limit of hearing for humans and are produced by earthquakes. 4. Have lower higher than the lower limit of hearing for humans and are produced by earthquakes. | Echo sounding uses   1. Low frequency sound waves. 2. Ultrasound waves. 3. Radio waves 4. Microwaves | Earthquakes emit P, S and L waves. Which statement below is true?   1. P waves are the only transvers wave. 2. S waves are the only transverse wave 3. P waves are longitudinal waves 4. L waves are longitudinal waves | Earthquakes emit P, S and L waves. Which statement below is true?   1. All of these waves can travel through liquids. 2. L waves only can travel through liquids. 3. P waves can travel through solids only. 4. All of these waves can travel through solids. | If an earthquake occurs on one side of the earth the following can be said about a point on the earth’s surface on the other side of the earth:   1. No seismic waves will be detected 2. Only S waves might be detected 3. P waves may be detected 4. All buildings will be destroyed. |  |
|  |  |  | A | B | C | D | C |  |
|  | **GCSEPWa 5** | Types of electromagnetic waves | The electromagnetic waves with the highest energy have:   1. The longest wavelength 2. The largest amplitude 3. The highest frequency 4. The slowest speed | Which of the following lists of electromagnetic waves are in order of increasing energy?   1. UV, IR, Radio waves, microwaves. 2. Radio, IR, Visible, gamma. 3. Gamma, X rays, UV, visible. 4. Radio, gamma, visible, microwaves. | Electromagnetic waves are:   1. Transverse waves. 2. Longitudinal waves. 3. Longitudinal and transverse waves 4. Sound waves | Human eyes are able to detect the following forms of e/m waves:   1. X rays 2. Infra red rays 3. Ultraviolet rays 4. Visible rays | When visible light is absorbed by the earth it is re emitted as   1. X rays 2. Infra red rays 3. Ultraviolet rays 4. Visible rays |  |
|  |  |  | C | B | A | D | B |  |
|  | **GCSEPWa 6** | Properties of electromagnetic waves | Refraction can occur when waves move from one medium to another because   1. Waves reflect when they hit a different material. 2. Waves have different frequencies in different materials. 3. Waves have different speeds in different materials. 4. Waves transfer energy to the mat 5. erial. | Which of the diagrams shows light being refracted as it enters and leaves a glass block?   1. .   .  .   1. . | What happens when a beam of light is shone at a block of glass with an angle of incidence of 90o?   1. The light will not refract because all parts of the wave front will change speed at the same time. 2. The light will refract because all parts of the wave front will change speed at the same time. 3. The light will not refract because the wave will not change speed. 4. The light will refract because the wave will slow down. | Matt black window blinds tend to warm up rooms because:   1. Black objects are poor absorbers of light. 2. Black objects are poor emitters of radiation. 3. Black objects are good absorbers of light and good emitters of radiation. 4. Black objects are good absorbers of light and poor emitters of radiation. | When light moves from air to water it is refracted less than when moving from air to glass because   1. Water does not refract light 2. Glass is denser than water. 3. Glass is more dense than air 4. Water is more dense than air |  |
|  |  |  | C | D | A | C | B |  |
|  | **GCSEPWa 7** | Uses of e/m waves | Infra red radiation is used in   1. Satellite communications. 2. The transmission of television signals. 3. Electrical heaters 4. Medical Imaging. | Microwaves are used in   1. Satellite communications. 2. The transmission of television signals. 3. Electrical heaters 4. Medical Imaging. | X rays are used in   1. Satellite communications. 2. The transmission of television signals. 3. Electrical heaters 4. Medical Imaging. | Radio waves are used in   1. Satellite communications. 2. The transmission of television signals. 3. Electrical heaters 4. Medical Imaging. |  |  |
|  |  |  | C | A | D | B |  |  |
|  | **GCSEPWa 8** | Lenses | The picture below shows light travelling through a convex lens  X  What is distance X called?   1. The virtual image. 2. The real image 3. The focal length 4. The image length | What type of lens is a Magnifying Glass?   1. Convex 2. Concave 3. Parabolic 4. Plane | A convex lens will make an image appear \_\_\_\_\_\_ if the object is placed between the focalpoint and the lens.   1. Smaller and upside down 2. Smaller and right side up 3. Larger and upside down 4. Larger and right side up | What is the image called that can be projected onto a screen using a lens?   1. Virtual 2. Real 3. Imaginary 4. Objective. | A convex lens produces the image below.  Image  The object tree is 20 cm tall and the image height is 30 cm tall. The magnification of the lens is:  Object   1. 600 cm2 2. 0.67 3. 10 cm 4. 1.5 |  |
|  |  |  | C | A | C | B | D |  |
|  | **GCSEPWa 9** | Visible light | When light reflects off a smooth surface in a single direction it is called   1. Diffuse reflection. 2. Specular reflection. 3. Diffuse refraction 4. Total internal reflection | Which description best describes how blue light filters work?   1. The filter absorbs only blue light. 2. The filter absorbs blue light and emits all other wavelengths 3. The filter absorbs all wavelengths of light and reflects blue light. 4. The flitter absorbs all wavelengths of light apart from blue, which it transmits. | Which description best describes why a blue hat looks blue in white light?   1. The hat absorbs only blue light. 2. The hat absorbs blue light and emits all other wavelengths 3. The hat absorbs all wavelengths of light and reflects blue light. 4. The hat absorbs all wavelengths of light apart from which it transmits. | Matt black objects   1. Reflect all wavelengths of light. 2. Absorb all wavelengths of light and only reflect black light. 3. Absorb all wavelengths of light. 4. Absorb no light |  |  |
|  |  |  | B | D | C | C |  |  |
|  | **GCSEPWa 10** | IR waves | As objects get warmer they always emit   1. More infra red radiation 2. More visible radiation 3. Less infra red radiation 4. Less visible radiation | When white light is refracted through a prism it produces a spectrum of colours. Where should a thermometer be placed to cause it to rise in temperature?   1. In the middle of the spectrum 2. In the blue part of the spectrum 3. Just beyond the blue part of the spectrum 4. Just beyond the red end of the spectrum | Infra red waves are   1. Higher frequency than UV but lower than visible. 2. Lower frequency than UV and shorter wavelength than microwaves. 3. Longer wavelength than radio waves and higher frequency than microwaves. 4. Shorter wavelength than gamma rays and a lower frequency than gamma rays. | When visible light is absorbed by an object it is re emitted mostly as   1. Gamma rays 2. X rays 3. Infra red radiation 4. UV radiation |  |  |
|  |  |  | A | D | B | C |  |  |
|  |  | Perfect black body radiation | A perfect black body is a material that:   1. Reflects all wavelengths of light that are incident upon it. 2. Transmits all wavelengths of light that are incident upon it. 3. Absorbs all wavelengths of light that are incident upon it. 4. Absorbs all wavelengths of light that are incident upon it and then emit all of this energy. | Hot drinks cool down quicker in black cups than white ones because:   1. White is a good absorber and poor emitter of radiation 2. Black is a good absorber and emitter of radiation. 3. Black is a good absorber and poor emitter of radiation. 4. White is a good absorber and emitter of radiation. | If a perfect black body is left outside under a light bulb and left for several hours after this time its temperature will:   1. Rise 2. Fall 3. Remain constant 4. Get warmer as it absorbs radiation and then cool down as it emits it. | Compared with white t-shirts how would a black one make you feel?   1. Hotter in the summer and colder in the winter. 2. Hotter in the summer and hotter in the winter 3. Colder in both winter and summer 4. Colder in the summer and hotter in the winter. |  |  |
|  |  |  | D | B | C | B |  |  |