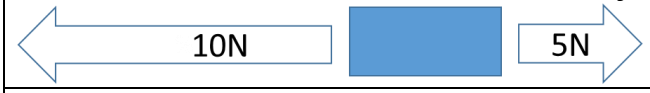
P5 Forces Fact Sheet

Contact and Non-Contact Forces	
1. Scalar quantities have only a …….[1]	**size (magnitude) [1]**
2. Vector quantities have ……..[1]	**size (magnitude) and direction [1]**
3. Is speed a scalar or vector quantity? [1]	**Scalar [1]**
4. Is velocity a scalar or vector quantity? [1]	**Vector [1]**
5. What do we call forces that happen when objects touch? [1]	**Contact Forces[1]**
6. What do we call forces that happen when objects do not touch? [1]	**Non-Contact Forces[1]**
7. Give an example of a contact force [1]	• **Friction** • **Air resistance** • **Tension in ropes[1]**
8. Give an example of a non-contact force[1]	• **Magnetic force** • **Gravitational force** • **Electrostatic force[1]**
Resultant forces	
1. State the unit for force [1]	**N (Newton) [1]**
2. What do we call the overall force actin on an object? [1]	**Resultant force [1]**
3. When forces are balanced, what will the resultant force be?	**0N (Zero Newton's) [1]**
4. What do we call the force a surface exerts on an object resting on the surface? (the forces pushes upwards on the object) [1]	Reaction force[1]
5. What are the forces acting on a book on a table? [1]	• Weight (downwards) • Reaction (upwards) [1]
6. What are the horizontal forces acting on an accelerating car? [3]	• Thrust • Friction • In opposite directions
7. What are the vertical forces acting on a boat? [2]	• Weight (downwards) • Upthrust (upwards)
8. State the resultant force on the object. 	• **5N** • **To the left**
9. State the resultant force on the object 	• **20N** • **To the right**

P5 Forces Fact Sheet

10. An object has an upward force of 100N and a downward force of 50N acting on it. State the resultant force and direction? [1]	**50N upwards [1]**
11. Name of the force that causes heating effects [1]	**Friction [1]**
Newton's First Law	
1. What happens to a stationary object if the forces are balanced?	**It stays stationary**
2. What happens to a stationary object if the forces are not balanced?	**It will start to move (in the direction of the larger force)**
3. What happens to a moving object if the forces are balanced?	**It stays moving at the same speed And in the same direction**
4. What happens to a moving object if the forces are not balanced?	**It will change speed or direction**
5. If there is a resultant force on a moving object will it accelerate or travel at a steady speed? [1]	Accelerate[1]
6. What is the resultant force on a stationary object? [1]	**0N (Zero Newton's) [1]**
7. What is the resultant force on an object moving at a constant speed in the same direction?	**0N (Zero Newton's) [1]**
8. If a car is travelling at constant 25m/s due north, what is the resultant force? [1]	0N (Zero Newton's) [1]
Newton's Second Law	
1. What is the equation relating force, mass and acceleration? [1]	**Force = mass x acceleration [1]**
2. If an object has an acceleration of 10 m/s^2 and a mass of 2 kg what is the size of the force? [4]	**F = ma = 2x10 = 20N [4]**
3. If an object has an acceleration of 5 m/s^2 and a mass of 20 kg what is the size of the force? [4]	**F= ma = 20x5 =100N [4]**
4. If a 20N force is applied to a mass of 2 kg what is the acceleration? [4]	a = F ÷ m = 20÷2 = 10m/s^2 [4]
5. What is the mass of a toy car if it has an acceleration of 2 m/s^2 when a force of 8 N is applied? [4]	m = F ÷ a = 8 ÷ 2 = 4kg [4]

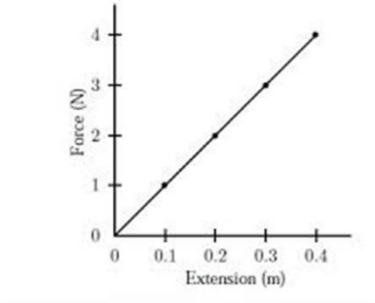
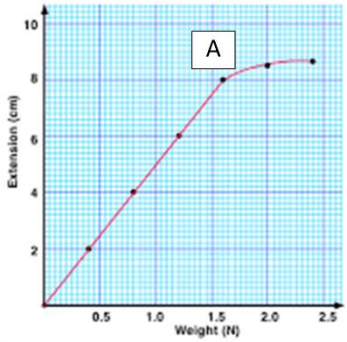
P5 Forces Fact Sheet

Newton's Third Law	
1. Newton's Third Law is…	**every action has an equal and opposite reaction [1]**
2. If a woman pushes on a wall with a force of 50N, what will the reaction force from the wall be?	**50N**
Mass, weight and gravity	
1. What is mass? [1]	**Amount of material (stuff) on object has [1]**
2. Weight is the ……. on an object due to gravity [1]	**force [1]**
3. How can weight be measured? [1]	**With a Newton meter [1]**
4. How does the gravitational field strength change as you get closer to a mass? [1]	Becomes stronger [1]
5. What is the unit of mass? [1]	**Kilograms[1]**
6. What is the equation to calculate weight? [1]	**Weight = mass x gravity [1]**
7. If a boy has a mass of 50kg, what is his weight? (g= 10 N/Kg) [4]	**W = m x g = 50 x 10 = 500 N [4]**
8. Describe the relationship between weight and mass [1]	Directly proportional [1]
9. What does this symbol mean? $\propto$	Directly proportional
10. What do we call the point at which the s of an object is thought be concentrated ? [1]	Centre of mass [1]
Work and energy	
1. When is work done?	**When a force moves an object [1]**
2. State the unit for work	**J (Joule) [1]**
3. What is the equation to calculate the work done? [1]	**Work done = Force x distance [1]**
4. What is transferred when a force moves an object? [1]	**Energy [1]**
5. If 1N moves an object 1m, how much energy is transferred? [1]	1J (Joule) [1]

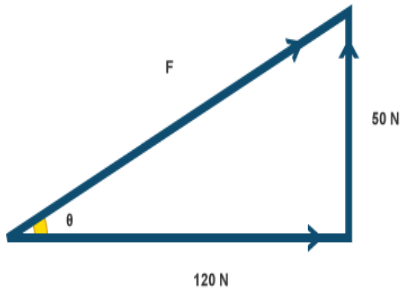
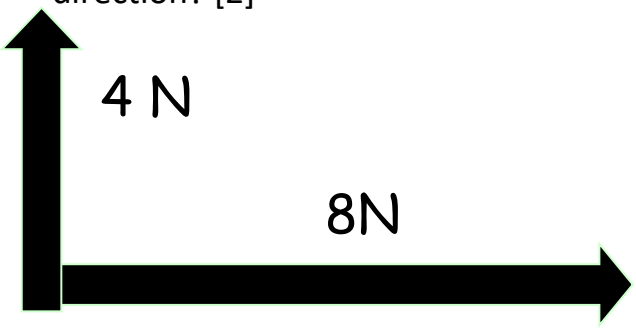
P5 Forces Fact Sheet

6. An object is lifted 10m by a force of 45N. How much work is done to lift the object? [4]	**Work = force x distance = 45 x 10 = 450 J [4]**
7. What happens to temperature when work is down against frictional forces?	**It goes up/ it gets hotter**
Forces and Elasticity	
1. What property does an object have if it goes back to its original shape after a force has been applied? [1]	**Elastic**
2. How do we describe an object that does not go back to its original shape when it has been stretched?	**Inelastic**
3. What type of energy is stored in a stretched elastic band [1]	**Elastic potential energy [1]**
4. Describe the relationship between force on an elastic object and extension, up to the limit of proportionality	Directly proportional
5. If a spring with a spring constant of 5 N/m, stretches 2 m, what was the force applied? [4]	**Force = spring constant x extension = 5 x 2 = 10N**
6. If a spring with a spring constant of 5 N/m, stretches 20 cm, what was the force applied? [5]	Convert cm to m: 20cm = 0.2m Force = spring constant x extension = 5 x 0.2 = 1N (5 marks, 1 extra for converting to m)
7. If a force of 50N is applied to a spring which stretches 2 m, what is the size of the spring constant? [4]	Spring constant = force ÷ extension = 50 ÷ 2 = 25 N/m
8. A spring with a spring constant of 3N/m is compressed by 1 m. Calculate the force applied. [4]	Force = spring constant x compression = 3 x 1 = 3N
9. Describe the relationship between the amount of work done to stretch a spring and the amount of energy stored in a spring (up to the limit of proportionality)	They are the same
10. If 50N are used to stretch a spring, state how much energy is stored in the spring [1]	50N

P5 Forces Fact Sheet

Investigating Springs	
1. What type of relationship is shown in the graph below? [1] 	**Linear [1]**
2. Name the point marked A on the graph below 	Limit of proportionality
3. Describe the relationship between weight and extension after point A on the graph above	Non-linear
4. If a spring is stretched past its limit of proportionality, what happens to it?	• It doesn't return to its original shape • It is not elastic
5. A spring is extended beyond the limit of proportionality; as you increase the force what happened to the amount of stretching? [1]	The spring stretches more [1]
6. Calculate the elastic potential energy of a bungee rope when it is stretched 3m. The spring constant for the rope is 7. The equation will be on the sheet. [4] Energy = 0.5 x spring constant x extension x extension	**E_e = 0.5 x spring constant x extension x extension** = ½ x 7 x 3 x 3 = 31.5J

P5 Forces Fact Sheet

Resultant Forces (HT)	
7. What is the resultant force? ***[1]***  	*130N [1]*
8 What is the resultant force and its direction? [2]  	*Magnitude = 8.9N* *Angle to vertical = 63^{O}*