



Home Learning expectations

- Written by yourself, in your own words.
- Completed by the due date.
- Finished to the best of your ability.
- Closely followed the instructions.
- Green penned and improved when needed.
- Peer or self-assessed when asked to.
- Presented so it is clear and neat.
- Proof read the work to ensure spelling, punctuation and grammar is to the best of your ability.

Task 1**Topic: Cells – Keywords – Self Assessment**

1. Define the term cell. (2 marks)

2. Define the term organelle. (2 marks)

3. Define unicellular organism. (2 marks)

4. Define magnification. (2 marks)

5. Define resolution. (2 marks)

6. Define tissue. (2 marks)

7. Define organ. (2 marks)

8. Define cytoplasm. (2 marks)

9. Define the nucleus. (2 marks)

10. Define a chloroplast. (2 marks)

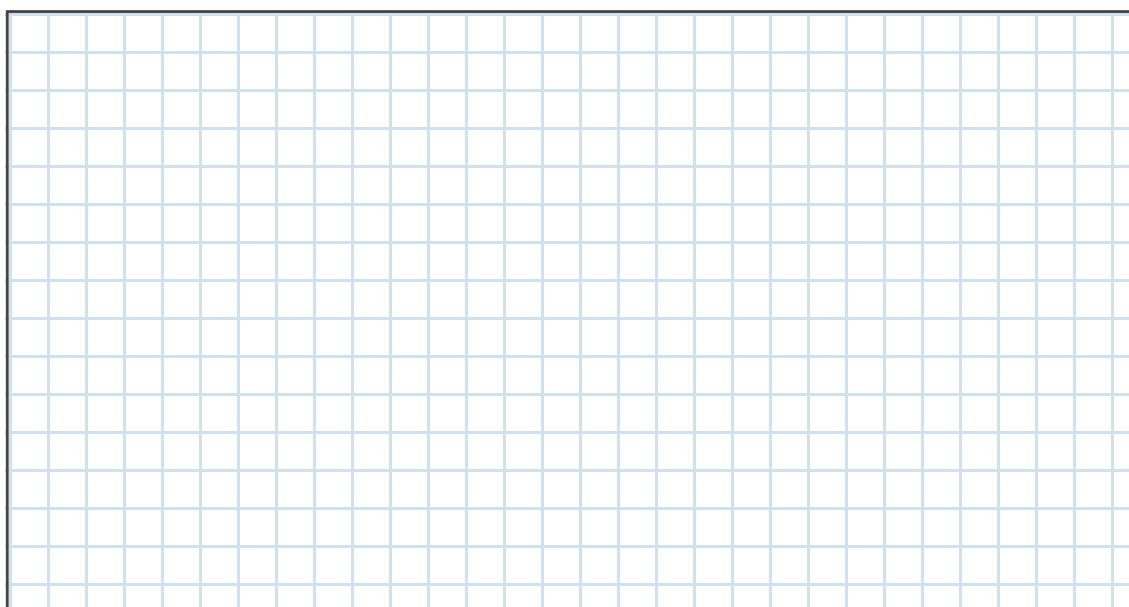
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Excellent homework (good comment)			
Good/completed			
Requires improvement			
Incomplete/unsatisfactory			

Task 2**Topic: How Science Works – Peer Assessment**

1. A student investigated how the extension of a spring changes when different forces are applied. Their results are shown in Table 1. Use the results to draw a graph on Graph 1.

TABLE 1: FORCE APPLIED TO A SPRING AND THE EXTENSION MEASURED

Force (N)	Extension (cm)
0	0.0
1	2.3
2	4.1
3	6.4
4	7.9
5	10.2



- (a) Label both axes of Graph 1. Write the name and the unit for each axis. The x-axis should show the independent variable (Force) and the y-axis the dependent variable (Extension). [1 mark]
- (b) Choose and mark a suitable scale on both axes so the data fills more than half the grid. Write the numbers at equal intervals along each axis. [1 mark]
- (c) Plot all six data points from Table 1 on Graph 1. Use a small cross (×) for each point. [1 mark]
- (d) Draw a straight line of best fit through the data points using a ruler. [1 mark]
2. Use your completed graph to answer the following questions.

- (a) Use your line of best fit to estimate the extension of the spring when a force of 2.5 N is applied. [1 mark]

- (b) Describe the relationship between the force applied and the extension of the spring. [1 mark]

3. Explain how you could use the graph to predict the extension produced by a force of 7 N. State your answer. (3 marks)

4. A student says that a force of 8 N will produce an extension of 20 cm. Do you agree? Use the graph to explain your answer. [2 marks]

5. Another student says, "If the force doubles, the extension always doubles." Use the graph to decide whether this statement is correct. [2 marks]

6. A student says, "If I keep increasing the force, the graph will always stay a straight line." Do you agree? Explain your answer. [2 marks]

7. A different spring extends by 3 cm when a force of 2 N is applied. Compare this spring with the one shown on the graph. Explain which spring is stiffer and use evidence from the graph to support your answer. [3 marks]

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Task 3**Topic: Cells – Self Assessment**

1. Draw a line to match each term to its meaning.

Cell	The smallest unit of a living thing
Tissue	A whole living thing
Organ	A group of organs working together
Organ system	A group of the same cells working together
Organism	Different tissues working together, e.g. the heart

2. Fill in the blanks using the words below.

[5 marks]

tissue organism organ cell organ system

A _____ is the smallest unit of life. A group of the same cells is called a _____. Different tissues work together to make an _____. A group of organs working together is called an _____. A whole living thing is called an _____.

3. Which of the following is the correct order of organisation, from smallest to largest?

[1 mark]

A Organ → Cell → Tissue → Organ system → Organism

B Cell → Tissue → Organ → Organ system → Organism

C Tissue → Cell → Organ → Organism → Organ system

D Organism → Organ system → Organ → Tissue → Cell

4. Which of the following is an example of an organ system?

[1 mark]

A The heart

B A muscle cell

C The digestive system

D Muscle tissue

5. Answer each question with one word or a short phrase.

(a) Name the level of organisation that comes after tissue.

[1 mark]

(b) Give one example of an organ found in the human body.

[1 mark]

(c) State what we call a whole living thing, such as a human.

[1 mark]

6. Describe what a tissue is and give one example of a tissue found in the human body.

(3 marks)

7. Explain how cells, tissues and organs are linked together to keep the body working. Use an example in your answer.

(4 marks)

8. Explain why a single muscle cell cannot keep your body alive on its own, but the heart can. In your answer, refer to levels of organisation.

(2 marks)

9. The stomach is an organ. Explain why calling it a tissue is incorrect.

(2 marks)

10. A scientist discovers a new structure in an animal. It is made of different tissues and works with the lungs and heart to move oxygen around the body. Explain what level of organisation this structure is and justify your answer.

(3 marks)

11. A mutation means some muscle cells in the heart cannot contract. Explain how this could affect the tissues, the organ and the organism.

(3 marks)

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Task 4**Topic: Forces Keywords – Self Assessment**

1. Define a contact force. (2 marks)

2. State the SI unit of mass. (1 mark)

3. State the SI unit of force. (1 mark)

4. Name the piece of equipment used to measure force. (1 mark)

5. Define gravity. (2 marks)

6. Define air resistance. (2 marks)

7. Define upthrust. (2 marks)

8. Define a stationary object. (2 marks)

9. Define balanced forces. (2 marks)

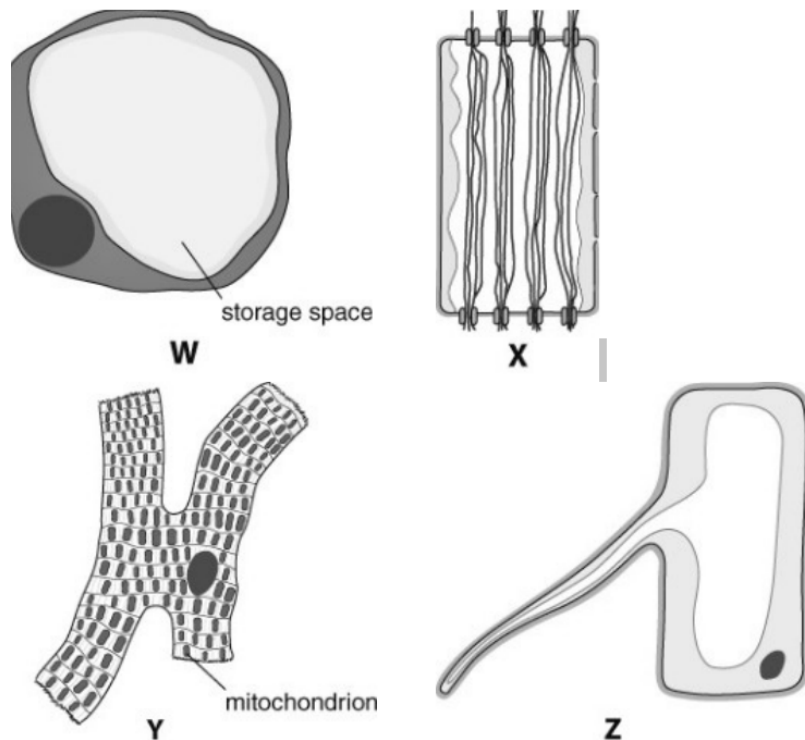
10. Define unbalanced forces. (2 marks)

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Task 5

Topic: HSW Math Skills (Cells and Organelles) – Peer Assessment

1. The cells in the drawings below are all specialised. Each has a special job to do, so some of their features are a little different compared with typical animal or plant cells.



For each cell, write down: **a** whether it comes from a plant or an animal; **b** your reasoning; **c** how it differs from a typical cell of the same organism; **d** a suggestion for its function, explaining your reasons.

Cell	a. Plant / animal?	b. Reasoning	c. How it differs	d. Suggested function
W				
X				
Y				
Z				

2. The term 'organelle' describes any distinct part of a cell found in the cytoplasm. List all the organelles in a plant cell from a leaf.

For information:
 1 mm = 1000 μm
 1 μm = 1000 nm
 mm = millimetre
 μm = micrometre
 nm = nanometer

3. The resolution of a microscope is the minimum distance between two points that will show up as two points. It is measured in nanometres (nm). A light microscope has a resolution of 200 nm; two points 200 nm apart appear as two points, but points closer than this appear as one. A laser microscope has a resolution of 20 nm and an electron microscope 1 nm. (Hint: convert the measurements from μm to nm.)

4. Unit conversions. Cells are very small, so scientists measure them in millimetres (mm) and micrometres (μm). Complete the table.

Measurement	Convert to	Answer
2 mm	μm	
0.75 mm	μm	
4500 μm	mm	
95 μm	mm	
0.15 mm	μm	
12 500 μm	mm	

5. Comparing cell sizes. A scientist measured four different cells.

Cell	Size
Muscle cell	80 μm
Skin cell	35 μm
Red blood cell	7 μm
Root hair cell	120 μm

a) Put the cells in order from smallest to largest.

b) Which cell is about 17 times bigger than a red blood cell?

c) How many micrometres larger is the root hair cell than the muscle cell?

6. Microscopy calculations. A microscope image shows the following cell sizes.

Cell	Size
A	0.040 mm
B	55 μm
C	0.12 mm
D	90 μm

Cell organelles are measured in micrometres (μm). Some human skin cells contain extra organelles, for example: lysosomes (about 0.1 μm in diameter), melanosomes (about 0.5 μm) and peroxisomes (about 1.5 μm). With which sorts of microscopes would you be able to see each of these organelles?

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Task 6

Topic: Unicellular Organisms, Plant and Animal Organs – Peer Assessment

1. MRS GREN

- a) What does the G stand for? _____
- b) What does the M stand for? _____
- c) What does the E stand for? _____

2. Life Processes – Which organisms carry out all seven life processes?

- ☐ Animals ☐ Humans ☐ Plants ☐ Animals and plants ☐ All organisms

3. Unicellular Organisms

a) Tick the best definition of 'unicellular'.

- ☐ Made of cells ☐ Made of many cells ☐ Made of one cell ☐ Made of one tissue ☐ A unique cell

b) Write U (unicellular) or M (multicellular) for each.

Bacteria	Humans	Plants	Yeast	Prokaryotes
U / M	U / M	U / M	U / M	U / M

4. Stem Cells – complete the sentences.

Stem cells can _____ to make more cells.

Stem cells can develop into many different _____.

Stem cells are used to repair _____ tissues.

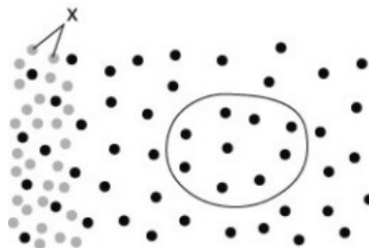
Tick TWO correct statements.

- ☐ Stem cells help repair damaged tissues.
- ☐ Bone marrow contains adult stem cells.
- ☐ Every body cell is a stem cell.
- ☐ Stem cells can only become one type of cell.

5. Cell Structures – Tick TWO structures found in an animal cell but not in a prokaryote.

- ☐ Cytoplasm ☐ Nucleus ☐ Cell membrane ☐ Mitochondria ☐ Water

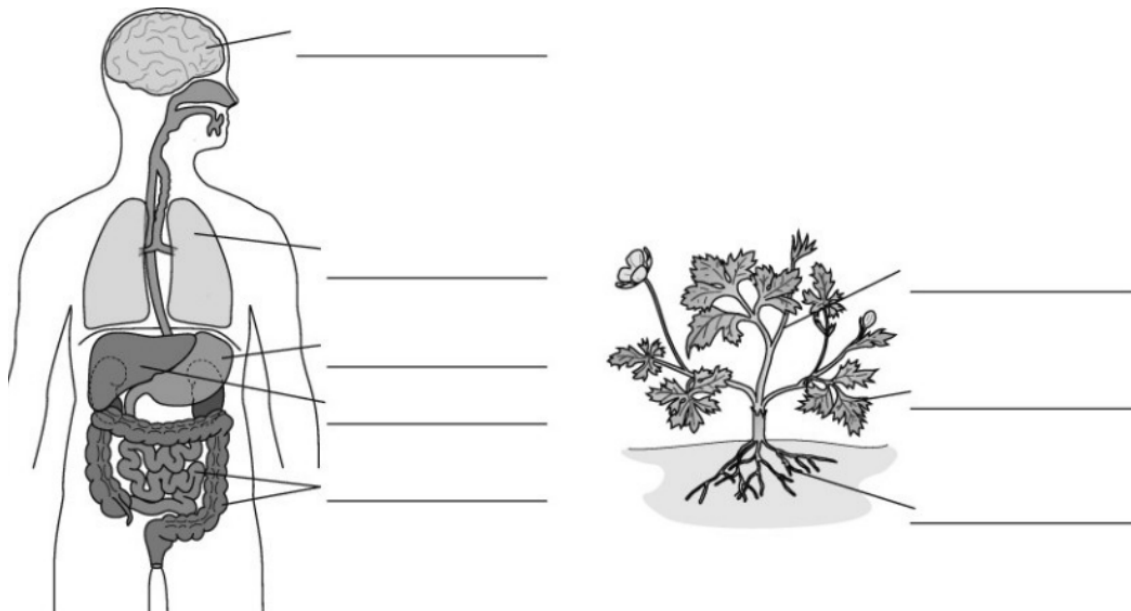
6. Diffusion



a) Draw arrows to show the overall movement of the particles.

b) Complete the sentences using: **diffuse materials organisms systems tissues**

7. Label the diagrams. Use these words: **brain intestines leaf liver lung root stem stomach**



8. Heart – Draw the position of the heart on the human body diagram above.

9. Human organs – Choose TWO human organs and explain what they do.

a)

b)

10. Plant organs – Choose TWO plant organs and explain what they do.

a)

b)

11. Organ – Which is the best definition of an organ?

- ☐ Part of an animal with an important job
- ☐ Part of a plant that you can eat
- ☐ A living thing
- ☐ Part of an organism with an important job

12. Complete the sequence:

Cell → _____ → Organ → _____ → Organism

A scientist says, “A whale has much bigger cells than a mouse.” Is the scientist correct? ☐ Yes ☐ No. Explain your answer.

13. A student looks at a cell using a microscope. The cell contains a nucleus, cytoplasm, mitochondria and a cell membrane. The student says, “This must be a prokaryote.” Do you agree? Explain your answer using evidence.

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Task 7**Topic: Forces – Self Assessment**

1. Read the text below. Underline each of the spelling, punctuation and grammar mistakes and correct them in green pen.
2. Answer the questions below the text.

A force is a push or pull in a particular direction. It can also be a twist. Forces affect how objects move, for example they can make objects start moving, stop moving, move faster, move slower, change direction or change shape. Forces cannot be seen but we can see their effects. An example of a force you have already studied is magnetism. We cannot see magnetic fields, but if we put a compass or iron filings close to it, they show us the position of the fields. Force is measured in Newtons, which we write as N.

Scalars and vectors

A physical quantity is something that can be measured. Quantities can be a scalar quantity or a vector quantity. Scalar quantities only have a magnitude. Vector quantities have both a magnitude and a direction. Vector quantities are represented using arrows. The larger the arrow the greater the magnitude of the vector. Force is an example of a vector quantity.

1. State what a force is.
2. What can we use to see magnetic field positions?
3. State the unit for forces.
4. Explain the effects of forces on objects.
5. Force Arrows Two students push a box. Student A pushes with a force of 30 N to the right. Student B pushes with a force of 20 N to the left. (2 marks)

a) Which way will the box move?

b) What is the resultant force?

6. Scalar or Vector? Complete the table. (4 marks)

Quantity	Scalar / Vector?
Speed	
Force	
Distance	
Velocity	

7. Explain Your Thinking A student says, "Mass and force are both vectors because they both have a size." Do you agree? Explain your answer. (3 marks)

8. Practical Skills A student investigates the effect of force on a toy car. They push the car with different forces but also change the type of surface each time. (4 marks)

a) Why is this not a fair test?

b) What should the student keep the same?

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Task 8

Topic: How Science Works – Peer Assessment

Topic: Using a Microscope Safely

When scientists observe cells, they must use laboratory equipment safely and carefully to obtain reliable results. A student wrote the following method for preparing an onion cell slide. Unfortunately, they made several mistakes in both their practical method and laboratory safety. Read the student's method carefully, then answer the questions.

Student's Method

1. Pick up the microscope with one hand and place it on the edge of the bench.
2. Cut a large piece of onion with scissors.
3. Place the thick piece of onion onto the microscope slide.
4. Add five drops of iodine stain directly onto the bench.
5. Put the coverslip straight down onto the onion.
6. Turn the microscope onto the highest magnification before looking through the eyepiece.
7. Use the coarse focus knob until the objective lens touches the slide.
8. When finished, leave the microscope on and the slide on the bench.

Q1. Which piece of equipment should be used to cut a very thin layer of onion?

- A Beaker B Forceps C Scalpel D Thermometer

Q2. Step 1 says to carry the microscope with one hand. Why is this unsafe?

- A The microscope becomes too hot
B It may fall and become damaged
C The lens will crack immediately
D Nothing is wrong

Q3. Step 4 says to place iodine directly onto the bench. Why is this poor laboratory practice?

Q4. Step 5 says to drop the coverslip straight down. How should the coverslip be placed instead?

Q5. Why should you start with the lowest magnification? Tick TWO.

- ☐ Easier to find the specimen.
☐ Gives the biggest field of view.
☐ Gives the highest detail immediately.
☐ Prevents damage to the slide and objective lens.

Q6. Which focus knob should usually be used on high power?

- A Coarse focus B Fine focus C Eyepiece D Revolving nosepiece

Q7. The student leaves the microscope switched on after the lesson. Explain TWO things they should do before putting the microscope away.

Q8. Match the equipment to its purpose.

Microscope	Stains cells so structures are easier to see
Coverslip	Holds specimen
Microscope slide	Observe cells
Iodine solution	Holds specimen flat

Q9. The student cannot see any cells through the microscope. Give two possible reasons why.

Q10. A student prepares an onion cell slide. They cannot see the cells clearly because the onion peel is too thick. Suggest TWO improvements to the method and explain why they would help.

Q11. A student says: "I started using the microscope on the highest magnification because it lets me see the cells better." Explain why this is not the best method. (4)

Q12. A student is carrying out a microscope practical. Tick FOUR actions that are unsafe.

- ☐ Carrying the microscope with two hands.
- ☐ Running while carrying a microscope.
- ☐ Leaving the iodine bottle open on the bench.
- ☐ Looking through the microscope using low power first.
- ☐ Leaving broken glass on the bench.
- ☐ Wearing safety goggles when using iodine.
- ☐ Touching microscope lenses with fingers.

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Task 9

Topic: Revision Challenge

Instructions. This homework is designed to help you revise everything you have studied so far in the Cells and Forces topic. Different classes may have completed different lessons, so only revise the lessons your class has already covered.

Choose **ANY FIVE** of the activities below. Each activity is worth 5 marks. Try to choose a variety. The aim is not to copy notes, but to organise your knowledge, test your memory and identify any gaps. Present your work neatly and use scientific vocabulary wherever possible.

Option 1 – Create a Mind Map

Choose one lesson you have studied. Create a colourful mind map showing everything you can remember: key vocabulary, definitions, diagrams, labelled drawings, examples and important facts. Organise your ideas using branches, colours and pictures so it is easy to remember.

Option 2 – Retrieval Challenge

Close your exercise book and revision booklet. Without looking at any notes, write down 10 facts you can remember from one lesson. Then check your work using your exercise book and correct any mistakes in a different coloured pen.

Option 3 – Key Vocabulary

Choose 8 scientific keywords from the lessons you have studied. Create a glossary by writing the keyword, a clear definition in your own words, and one labelled diagram or example to help explain it. Avoid copying directly from your book whenever possible.

Option 4 – Draw and Explain

Choose two scientific diagrams from your exercise book. Redraw both carefully and label every important feature. Under each diagram, write a short explanation describing what it shows and why it is important. Diagrams should be neat, clear and fully labelled.

Option 5 – Become the Teacher

Imagine you are writing next week's homework. Write three exam-style questions based on one lesson: one multiple-choice, one short-answer and one challenge question. Then write the correct answers underneath.

Option 6 – Flow Chart

Choose one scientific process you have learned. Create a flow chart that explains the process step by step. Use arrows, short sentences and diagrams where appropriate. Your flow chart should be easy for another student to follow.

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Task 10**Topic: Atoms Keywords – Self Assessment**

1. Define the term **chemical reaction**. (2 marks)

2. Define the term **element**. (2 marks)

3. Define the term **evaporation**. (2 marks)

4. Define the term **reactant**. (2 marks)

5. Define the term **combustion**. (2 marks)

6. Define the term **product**. (2 marks)

7. Define the term **melting**. (2 marks)

8. Define the term **freezing**. (2 marks)

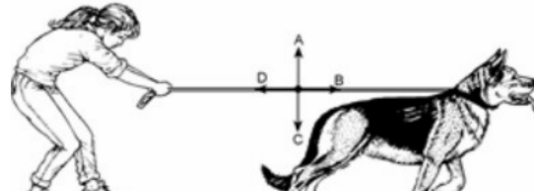
9. Define the term **condensation**. (2 marks)

10. Define the term **physical change**. (2 marks)

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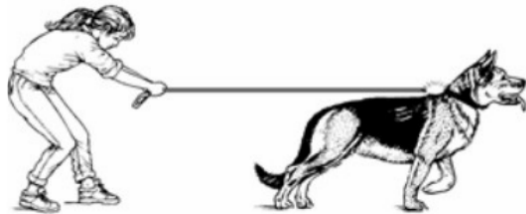
Task 11**Topic: Forces – Self Assessment**

Q1. Megan's dog is pulling on his lead. Which arrow, A, B, C or D, shows the direction of this force?



a) Megan has to pull to keep the dog still. Which arrow shows the direction of this force?

b) Suddenly the dog's collar breaks.



c) When the collar breaks, the lead moves. Draw an arrow on the diagram to show which way the lead starts to move.

d) Why does the lead move when the collar breaks?

Q2.

a) Some of the statements below describe forces, and some do not. Tick the boxes by the three forces.

The movement of a car travelling along a road ☐

The push of a jet engine on an aeroplane. ☐

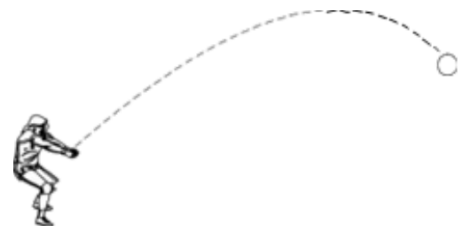
The flow of electricity through a light bulb. ☐

The weight of a book on a table. ☐

The pull of a horse pulling a cart. ☐

The speed of a hockey ball flying through the air. ☐

b) A girl throws a ball. The diagram shows the path of the ball after she has thrown it. How can you tell from the **path** of the ball that there is a force acting on the ball? (1 mark)



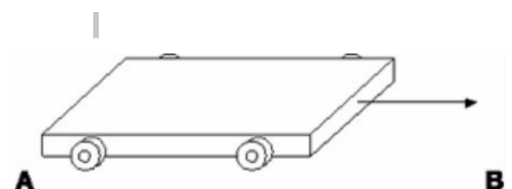
c) The drawing shows a trolley rolling along a table from A to B. Then another force acts on the trolley, shown by the arrow. What effect does this force have? Tick the correct box. (1 mark)

☐ It makes the trolley go faster.

☐ It makes the trolley go slower.

☐ It makes the trolley change direction.

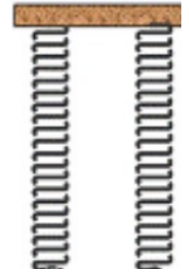
☐ It has no effect.



Q3.

a) A spring extends by 10 cm when a 100 g mass is attached to it. What is the spring constant? (Calculate your answer in N/m.) (4 marks)

b) State the spring constant if two identical springs from part a were combined as shown in the picture. Explain your answer. (2 marks)



Q4. A toy car is pushed with a force of 15 N to the right. At the same time, friction acts on the car with a force of 6 N to the left.

- a) Calculate the resultant force acting on the car. Answer: _____ (2 marks)
- b) Which way will the car accelerate? ☐ Left ☐ Right ☐ It will stay still (1 mark)

Q5. The diagram shows a book resting on a table. Draw TWO force arrows on the book and label each arrow with its name. Why does the book stay still? (4 marks)

Q6. A student says: "If a moving object is slowing down, there must not be any forces acting on it." Do you agree? Explain your answer.

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