

**SCIENCE DEPARTMENT**

**Double Year 11**

**Physics - Revision Questions**

Name:

# Topic 1 – Speed, Distance and Acceleration



1.

1. Find the speed between 0 and 2s.
2. Where is the highest speed? How do you know?
3. What is the speed between 8 and 10s?
4. What is the mean speed?
5. Between which times is the vehicle stopped?

2.



1. What is the acceleration between 10 and 15s?
2. Where is the acceleration the greatest?
3. Where is the car moving at constant speed? What is the constant speed?
4. What is the deceleration of the car?
5. What is the distance travelled between 10 and 15s?

##  Stopping Distances

1. What does stopping distance of a vehicle mean?
2. What is the thinking distance and reaction time?
3. What is the braking distance?
4. Give 3 things that will affect the thinking distance.
5. Give 3 things that will affect the braking distance of a vehicle.
6. Name 4 ways that the car manufactures make cars safe.
7. How does the law keep us safe when in a vehicle?

# Topic 2 – Newton’s Laws

1. What is inertia?
2. What is Newton’s First Law of motion?
3. What do unbalanced forces do to an object? (3 things)
4. What is Newton’s Second Law of Motion?
5. Using F=ma
6. What is Newton’s Third Law of motion?
7. Understanding the take-off of a rocket:
8. A rocket has a mass of 75kg. the force needed for the rocket to take off is 1500N. (g = 10m/s2)
9. Draw a rocket and label the forces on it at take-off.
10. Calculate the initial acceleration of the rocket.
11. Why does the acceleration of the rocket increase during the flight?
12. Explain using Newton’s laws how a rocket takes off.
13. Explain how a person falling out through the air reaches terminal velocity.
14. Explain how opening a parachute can reduce the final velocity of a person so he is at a safe speed to land.

# Topic 3 – Work and Energy

1. State the law of conservation of energy.
2. Using the equations for conservation of energy.
3. A car is moving down a hill as shown. Find the Gravitational potential Energy at the top if the car’s mass is 10kg.
4. Assuming there is no frictional forces on the slope, find the velocity at the bottom.

50m

1. A car of mass 10kg is going down another slope where friction cannot be neglected as shown.



50m

1. Find the gravitational Potential energy at the top.
2. Find the kinetic energy at the bottom if the velocity is 15m/s.
3. What is the work done on the car travelling down the slope?
4. What is the average force against friction on the car if the length of the slope is 100m?

## Safety Features of Cars

1. What are aerodynamic losses and how can they be reduced?
2. What are rolling losses and how can they be reduced?
3. What are idling losses and how can they be reduced?
4. What are inertial losses and how can they be reduced?
5. Explain how airbags, crumple zones and seatbelts can reduce injury during a crash.
6. What do headrests protect against?
7. What is a roll cage used for?

## Hooke’s Law

1. Explain how you would find the spring constant of a spring. Draw a diagram to help you.
2. Using a graph of Force and Extension.



1. Using the graph, what is the spring constant?
2. Using the graph, find the energy stored in the spring.
3. Add a line on in green that shows 2 of the same springs in parallel.
4. Add a line on in red that shows 2 of the same springs in series.

# Topic 4 – Stars and Planets

## Solar System

1. Describe the theory of how the solar system formed.
2. Describe the object at the centre of our solar system.
3. What is the order of the planets starting with the furthest from the Sun?
4. Between which two planets is the asteroid belt located?
5. What types of objects are located in the asteroid belt?
6. Name the ‘rocky’ planets
7. Name the ‘gas giant’ planets
8. Describe the orbit of a comet
9. What is the relationship between orbital time and distance from the Sun

## Features of the Universe

1. What is meant by the term ‘planetary system’?
2. What is meant by the term ‘galaxy’?
3. Place the following in order starting with the smallest:

 Planetary system, moon, Universe, asteroid, planet, galaxy, star

1. What is the meaning of 1 A.U.?
2. What is a light year?
3. What is 6 light years in meters?
4. How long does it take light to travel 20 light minutes?

## Life Cycle of Stars

1. Describe star birth.
2. What is the process that occurs in the core of a main sequence star and what are the conditions needed?
3. If the star is not large enough to fulfil the conditions above then what type of star is formed?
4. While a star is on the main sequence describe the forces acting on the star.
5. What will happen to our Sun when fusion stops?
6. Describe all possible star deaths from stars much larger than our Sun.
7. Why does fusion stop when it reaches iron?
8. How do elements heavier than iron get made?
9. Explain why the planets orbit the Sun in their current order.

# Topic 5 – Types of Radiation

1. What is the nucleon number, proton number and the number of neutrons of the following nuclei:
	1. $$
	2. $$
2. What is an isotope?
3. Why are some nuclei radioactive and some aren’t?
4. Why must experiments using radioactive sources be done for long periods of time and repeated?
5. Why is radioactive waste dangerous and expensive to dispose of?
6. What is background radiation?
7. What are the main parts of background radiation?
8. How does radiation get into food and drink?
9. What is radon gas?
10. What does ‘correcting for background radiation’ mean and how do you do it?
11. What are the 3 types of radiation?
12. What are the 3 types of radiation stopped by?
13. What is an alpha emitter?
14. What is a beta emitter?
15. Why is alpha radiation dangerous when ingested?
16. Why is gamma the most dangerous outside the body?
17. What is the symbol for alpha?
18. What is the symbol for beta?
19. What is the symbol for gamma?
20. The following emits alpha radiation, balance the equation:



1. The following is a beta emitter, balance the equation:



# Topic 6 – Half Life

1. What does half life mean?
2. What is the unit of activity?
3. Carbon-14 has a half life of 5700 years. It has a count of 6000Bq. What is the count rate after 22800 years?
4. How long does it take the count to fall below 100Bq?
5. What is the half life of this material?



1. Explain how a smoke alarm works.
2. Explain how radioactivity can be used as a tracer in the human body and as a tracer in a pipe? What type of radiation is used and why?
3. What type of radiation do we use to measure the thickness of steel and why? What type of half life is needed?
4. Why don’t we use alpha radiation in the body for tracers?
5. What length of half life is used when tracers are inside the body?
6. What length of half life is used when radiation is used in machinery?
7. Explain how carbon dating can be used to tell the age of old objects