Transition Pack
AS level Physics

Summer 2026

Name: _____

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Introduction

Welcome to the Physics Department at Wigston College in Wigston, Leicester. We are delighted that you have chosen to study Physics at A-level with us. We love our subject, and look forward to helping you enjoy it too! At Wigston College, we study the OCR Physics A course. This has a modern approach to current physics topics whilst still including more traditional aspects.

What to expect

So far in your education, you may have found GCSE's a breeze, and sailed through your exams having been predicted great grades. Or you may have worked hard for your exams and know that rewards came because you applied yourself. It makes no difference which side of success you start on, the following year will be one of the most difficult you will have faced in your schooling so far. Whatever your learning style, and however adept you are at last-minute revision(!) 'A' level Physics requires ability and **a great deal of hard work from every student.** No-one is clever enough to just 'wing it'.

The jump from key stage 3 to 4 is small compared from the giant leap from key stage 4 to 5. Some students cross carefully, with caution and preparation, others jump head first without realising the extent of the chasm they are approaching. We will help you prepare, support, and guide you. The rest is up to you.

Expectations

You will be expected to:

- Complete at least one hour of self-study for every lesson you have in the lab (1 hour per night should be normal)
- Complete pre-reading from the course text and wider reading before each lesson
- Attend intervention as and when required
- Contribute fully to lessons and ask questions if you are unsure
- Complete all tasks to the best of your ability

What you will get in return:

- Quality teaching
- Support, guidance and assistance whenever needed
- Thorough exam preparation
- Extra resources and activities to extend your learning

OCR Physics A course content

All of the following information is available on the OCR website. For students following the A2 route, you will still complete the same content as the AS students as the courses are taught in parallel.

Modules Taught		Assessments	Weighting
Unit 1 Development of Practical skills		Breadth of Physics (01) 70 Marks 1.5 Hours June	50% of total AS Level
Unit 2 Foundations of Physics		Depth in Physics (02) 70 Marks 1.5 Hours June	50% of total AS Level
Unit 3 Forces and Motion		There is no assessed practical in AS Level.	
Unit 4 Electrons, waves and photons			

Practical investigation skills will be taught along side your lesson content so it is essential that you make the most of every lesson and opportunity that arises. There are no practical assessments at AS Level. A2 level students will keep a log of specific experiments that are completed as part of their A2 Practical component.

How to succeed

Now we come down to the basics. You have decided that the course is for you and you are looking forward to Physics at Wigston. What should you do to make sure that you succeed? The following may seem obvious but are essentials for a successful outcome to your time studying Physics.

What you should do is:

- Make notes in class. Initially, these notes will be handed in for marking to ensure that you are meeting a standard. Notes will need to be added to when you leave the lesson through your own additional reading.
- Complete out of class activities and questions and return them for marking. Exam style questions will be set for each part of the unit. You must complete all question sets to have a complete set of assessments. No missing assessments are acceptable.
- Read up in preparation for your next lesson. Forewarned is forearmed! It will be your responsibility to read in advance, the text, the slides, and the practical work that we will be covering in the lessons.
- Ask questions, no matter how basic. You will have to push yourself out of your comfort zone at times and we fully expect you to ask what seem to be silly questions. They're not! All questions are relevant if it helps you to gain a better understanding.
- Talk about it. Get to know your class members so you can discuss lesson content. Make study groups or get a study buddy.
- Study outside of the classroom. For every hour in class you should complete in the lab, an additional hour reading up and revising the lesson should be planned in to your study timetable.
  These may seem obvious but once you have your study periods and what seems like 'free time' it's easy to relax into A-levels, and then get bad results or fail.

What not to do…

Don't take it easy and expect that you'll do well. AS Physics takes commitment from the first lesson. You will be assessed from the start and need to make good progress throughout the year.

Don't expect that you'll be given all the answers. Self directed learning will enrich your lessons and give you a more rounded picture of the subject matter. Learning in your own way personalises the journey.

Don't ignore the bits that you are struggling with. They won't go away until you deal with them. Come and see us.

First steps at A-level

Be prepared from the first day.

- Course text book
- Lesson note book / loose-leaf paper
- You will be given some useful revision book suggestions. These cover all of the basics for each topic and are a useful reference throughout the course. We will use the content from this book throughout the year so **use it and learn it.**
- Log-in details to some excellent on-line resources

The first lesson:

- Summer transition work – you will be expected to hand in your transition tasks on the first lesson of the course.
- Paper and pens – taking notes during lessons is an essential part of A-levels and this is a task that will become more independent as you progress through the year.

Additional needs

- Scientific calculator – a must have for any Physics student
- A revision guide
- Additional text books. You may want to buy a text book in addition to the course text. This is not essential but there are some new publications that are excellent, and we will be able to sell them to you at discounted prices.

Summer starter tasks

As an introduction to the course and to enable you to start your AS Physics with confidence, you are required to complete four tasks over the summer.

1) Researching information is a key skill required to extend your learning from the lessons. You are required to recall the following information which you must now research and remember. Present this with you exam paper and write up on the first lesson. You need to stretch yourself for these tasks, do not copy and paste information. Read and write notes reflecting your understanding of:

- Kirchhoff's first and second laws
- The reflection, refraction and diffraction of light waves
- Typical values for the wavelengths of the different regions of the electromagnetic spectrum, and their uses.
- Torque of a couple and moment of a force.

2) If you were present during the induction lessons you will have carried out a practical investigation. To show us some of your skills as a potential physicist, you now need to write up the practical investigation. Hand in your write up during your first lesson.

3) As a preparation for our first lessons in September please also find out about the following topics. Make brief notes, write down any questions you may have; then bring them to the first lesson. It's ok if there are bits you don't understand. We will check that you have 'pre-learned' these topics.

Physical Quantities and Units
Motion

An excellent place to start researching is:

alevelphysicsonline.com/ocr-spec-a

As a sign of your commitment and preparation for AS Physics, we expect that these pieces of work be done during your extended summer break. Should you not complete the summer work and hand it in during the first Physics lesson you will be asked to reassess your willingness to join the Physics course. For students who have a delayed arrival at their A-level choices, they will be asked to complete the summer work. Any further failure to commit to the work ethic of the Physics department and you will be requested to withdraw from the course. This is not a course to enter into lightly.

Summary

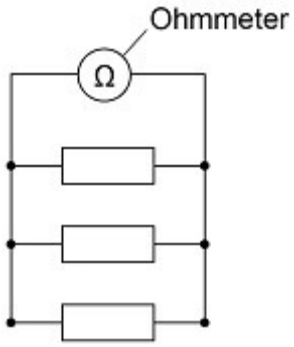
After reading through our transition pack, we hope you are excited, and not too daunted, about starting AS Physics in September. Remember the rewards justify all the hard work :)

Q1.

A student investigated how the total resistance of identical resistors connected in parallel varied with the number of resistors.

The student used an ohmmeter to measure the total resistance of the resistors.

The diagram below shows the student's circuit with 3 resistors.



The student repeated each reading of resistance three times.

The table below shows some of the results for 3 resistors in parallel.

Number of resistors	Total resistance in ohms			
	Reading 1	Reading 2	Reading 3	Mean
3	15.8	15.3	**X**	15.7

(a) Calculate value **X** in the table above.

_____

_____

_____

X = _____ Ω

(2)

(b) The student thought that taking a fourth reading would improve the precision of the results.

The fourth reading was 16.2 Ω.

Explain why the student was wrong.

_____

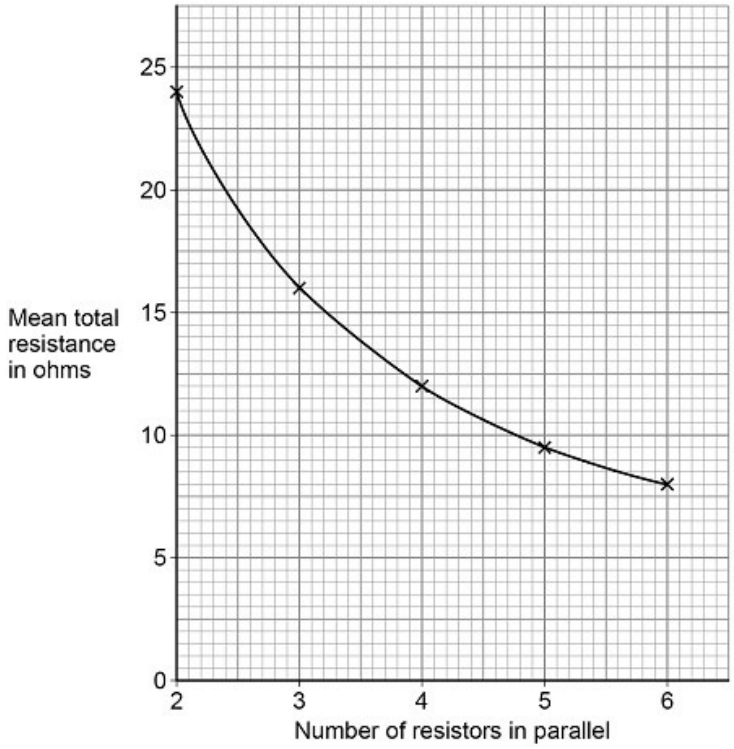
_____

_____

_____

(2)

The graph below shows the results from the investigation.



(c) The student concluded that the number of resistors in parallel was inversely proportional to the mean total resistance.

Explain why the student was correct.

Use data from the graph in your answer.

_____

_____

_____

_____

_____

_____

(3)

(d) Explain why adding resistors in parallel decreases the total resistance.

_____

_____

_____

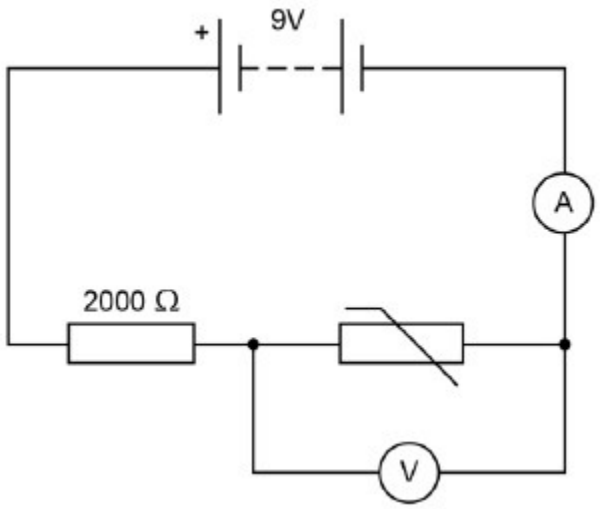
_____

(2)

(Total 9 marks)

Q2.

The diagram shows a temperature sensing circuit used to control a heating system in a house.



(a) What quantity does the ammeter measure?

_____

(1)

(b) The current in the circuit is 3.5 mA when the potential difference across the thermistor is 4.2 V

Calculate the resistance of the thermistor.

_____

_____

_____

Resistance = _____ Ω

(3)

(c) Calculate the charge that flows through the thermistor in 5 minutes when the current is 3.5 mA.

_____

_____

_____

Charge = _____ C

(3)

(d) Explain why the potential difference across the thermistor changes as the temperature in the house decreases.

_____

_____

_____

_____

(2)

(e) The circuit shown in the diagram can be modified to turn lights on and off by replacing the thermistor with a Light Dependent Resistor (LDR).

Draw the circuit symbol for an LDR in the space below.

(1)

(Total 10 marks)

Q3.

In a world record attempt, a skydiver jumped from a height of 40 km above the Earth.

(a) The figure below shows an incomplete free-body diagram for the skydiver a few seconds after the start of the jump.

The skydiver has not reached terminal velocity.

Complete the free-body diagram in the figure above.

(2)

(b) During the first 2.5 minutes the mean acceleration of the skydiver was 0.64 m/s^2.

The initial velocity of the skydiver was 0 m/s.

Calculate the velocity of the skydiver 2.5 minutes after the start of the jump.

Velocity = _____ m/s

(4)

(c) The skydiver accelerated until reaching terminal velocity.

Explain why the skydiver reached terminal velocity.

(4)

(d) Explain why the atmospheric pressure acting on the skydiver increased as the skydiver fell.

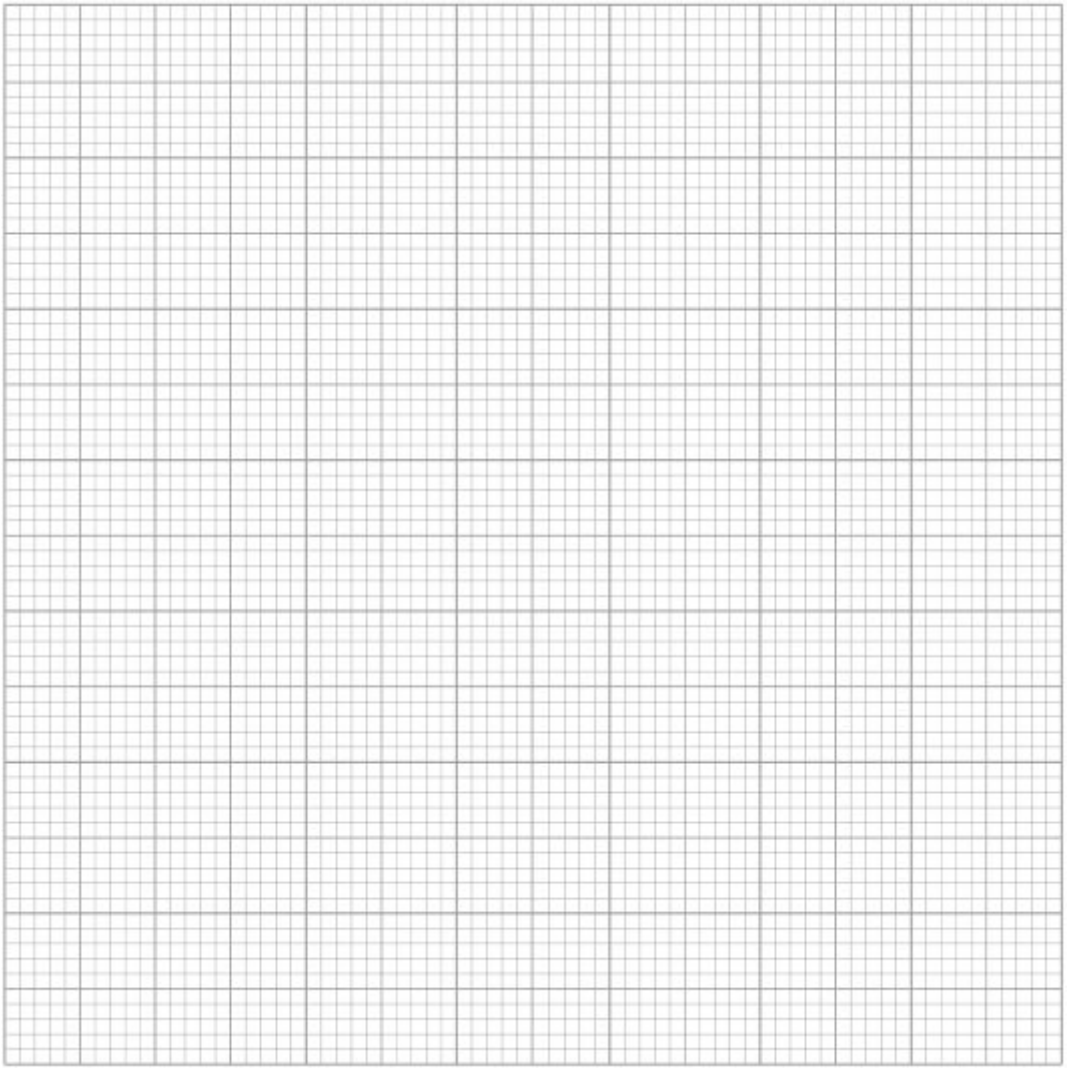
(2)

(e) The skydiver opened his parachute.

A few seconds after opening the parachute, the resultant vertical force on the skydiver was 240 N upwards.

The wind caused a resultant horizontal force of 200 N to the left on the skydiver.

Draw a vector diagram to determine the resultant force on the skydiver.



Magnitude of resultant force = _____ N

Angle to vertical of resultant force = _____ degrees

(4)

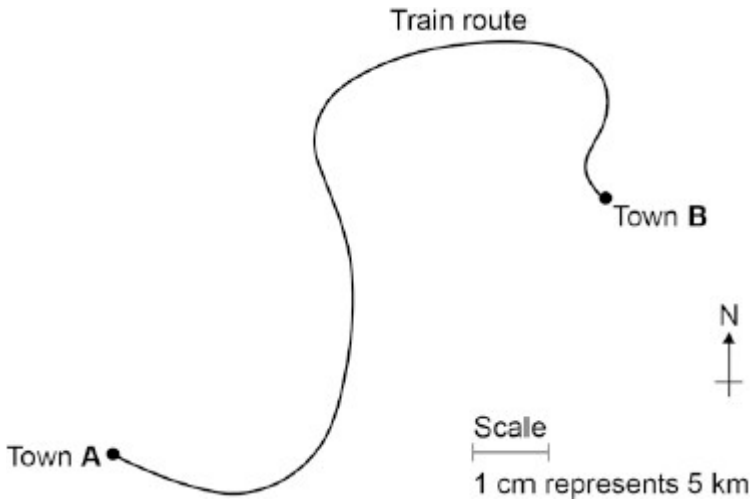
(Total 16 marks)

Q4.

A train travels from town **A** to town **B**.

Figure 1 shows the route taken by the train.
Figure 1 has been drawn to scale.

Figure 1



(a) The distance the train travels between **A** and **B** is not the same as the displacement of the train.

What is the difference between distance and displacement?

_____

_____

_____

(1)

(b) Use **Figure 1** to determine the displacement of the train in travelling from **A** to **B**.

Show how you obtain your answer.

_____

_____

Displacement = _____ km

Direction = _____

(2)

(c) There are places on the journey where the train accelerates without changing speed.

Explain how this can happen.

_____

_____

_____

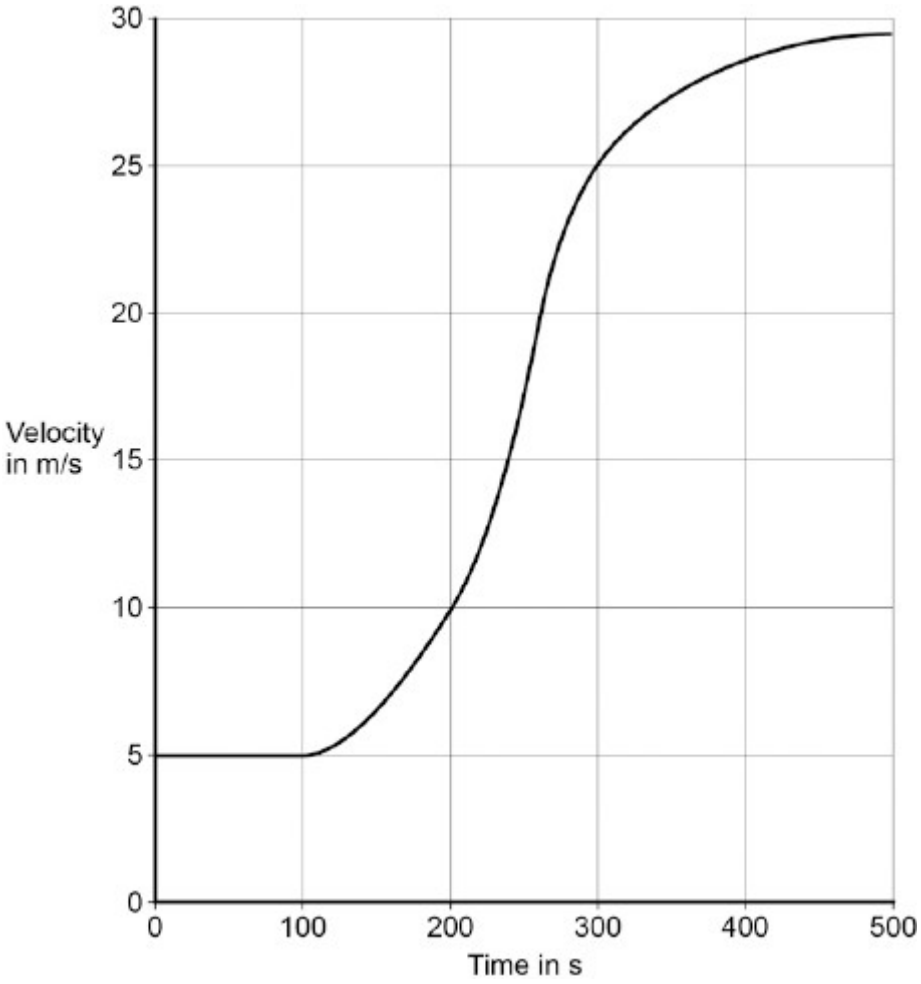
_____

(2)

(d) **Figure 2** shows how the velocity of the train changes with time as the train travels

along a straight section of the journey.

Figure 2



Estimate the distance travelled by the train along the section of the journey shown in **Figure 2**.

To gain full marks you must show how you worked out your answer.

_____

_____

_____

_____

Distance = _____ m

(3)

(Total 8 marks)