

Physics Induction Activity August 2019



Hello and welcome to the physics department! In order to make sure that we can make lots of progress quickly in September we need you to complete this activity.

Bring this to your first Physics lesson in September. If you don't want to print this off just bring a copy of your answers.

Your first things to do:

- Download any QR reader to your phone (type in "QR reader" into the app store or PlayStore).
- Find the Alevelphysicsonline (<http://www.alevelphysicsonline.com/>) website and bookmark it to your browser. You will be using this website a lot during your time here.

Task One

Watch the following videos. The QR codes will take you straight to them or you can use the web addresses underneath.



<https://www.youtube.com/watch?v=iwWfoet4-zc&index=1&list=PLIDtVvefFYT8OpWzDcHEZTCIQaEnQ3QoL>

<https://www.youtube.com/watch?v=jLRoseFxm30&list=PLIDtVvefFYT8OpWzDcHEZTCIQaEnQ3QoL&index=2>

<https://www.youtube.com/watch?v=Sb8cxC4IOy8&index=3&list=PLIDtVvefFYT8OpWzDcHEZTCIQaEnQ3QoL>

https://www.youtube.com/watch?v=O4tA6Nt_jig&index=4&list=PLIDtVvefFYT8OpWzDcHEZTCIQaEnQ3QoL

<https://www.youtube.com/watch?v=ceneATH5EZ8>

Task Two

Complete the following questions over the page and bring them to your first physics lesson in September. **Show your working for any calculations.**

A. Large and small numbers and standard form:

1. Write 100 000 as a power of 10

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2. Write 0.001 as a power of 10

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3. Write 2530 in standard form

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4. Write 0.0091 in standard form

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5. Write 8.31×10^6 as a normal number

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6. Write 6.002×10^{-2} as a normal number

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B. Metric prefixes

1. Convert 326.9 GW into W. Express in standard form.

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2. Convert 54 600 mm into m. Express in standard form.

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3. Convert 1002 mV into V. Express in standard form.

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4. Convert 9212 km into m. Express in standard form

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5. Write $2.3 \times 10^2 \mu\text{m}$ in m. Express in standard form

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C. Using your calculator (express your answer in standard form to three significant figures)

1. Calculate 423π
2. Calculate the number of seconds in a week.
3. The charge of an electron is 1.6×10^{-19} C. Calculate the total charge of one mole of electrons. (1 mole of electrons contains 6.02×10^{23} electrons)
4. Calculate $(1 \times 10^{-3})^2 \times 3.14 / 4$
5. Calculate $5.11 \times 10^5 \times [1.6 \times 10^{-19} / (3.0 \times 10^8)^2]$

D. Rearranging equations

1. $E = \frac{1}{2} mv^2$ (make v the subject)
2. $A = \pi r^2$ (make r the subject)
3. $F = ma$ (make a the subject)
4. $E = mc^2$ (make m the subject)
5. $v^2 = u^2 + 2as$ (make a the subject)
6. $F = GMm/r^2$ (make M the subject)

E. Base and Derived Units

1. List the six base **units** that you will be using in A Level physics.
2. Charge is calculated as $charge = current \times time$. Determine the **base units** for charge.
3. Kinetic energy is calculated as $kinetic\ energy = \frac{1}{2} \times mass \times speed^2$. Determine the **base units** of kinetic energy.
4. Pressure is calculated as $pressure = force/cross\ sectional\ area$. Determine the **base units** for pressure.

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Section B	/5
Section C	/5
Section D	/6
Section E	/8
Total	/30