



BRIDGING THE GAP

Physics



Course Title	Examination Board & Web Address
A-Level Physics	AQA www.aqa.org.uk

Units/Topics Studied:

Measurements and their errors, Particles and radiation, Waves, Mechanics and materials, Electricity, Further mechanics and thermal physics, Fields and their consequences, Nuclear physics

Bridging Task

Part One:

Find out the answers to the following questions

1. How is it that two sound waves can combine to give silence?
2. How do polaroid sunglasses darken reflected light more than non-reflected light?
3. What's the difference between *Centrifugal* and *Centripetal* force
4. Why did the Tacoma Narrows bridge fall down?
5. What are protons and neutrons made of?
6. Use the equation $E = mc^2$ to explain how the Large Hadron Collider can make new matter.
7. What is a pulsar?
8. How big are black holes?
9. What big change in our understanding of physics was brought about by the photoelectric experiment
10. What big change in our understanding of physics was brought about by Rutherford's alpha scattering experiment.

Useful websites:

<https://surendranath.org/>

<https://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html&sort=alpha&view=grid>

<https://www.animations.physics.u.nsw.edu.au/>

Part Two:

Choose **ONE** of the following tasks to complete

<p align="center">Measuring The Gravitational Field Strength</p> <p>Make a pendulum from a long piece of thread with a weight on the end. Suspend it from the ceiling. Set it swinging, (small swings only). Use a stop watch to time one complete swing. This is called, <i>The Period T</i>. Measure the length <i>l</i> of your pendulum.</p> <p>Calculate the field strength <i>g</i> using $g = \frac{4\pi^2 l}{T^2}$</p> <p>Repeat for different lengths and calculate an average value. (Your answer should be about 10Nkg^{-1})</p>	<p align="center">Interactive Poster</p> <p>Produce an A3 Size poster explaining how stars are created and evolve. Make your poster interactive, with questions, answers, hidden information etc</p>
<p align="center">Weird Physics</p> <p>Prepare a PowerPoint presentation about thixotropic liquids. You will need to explain what this means. It must include a video clip of both positive and negative thixotropic liquids that you have made and filmed yourself.</p>	<p align="center">Future Physics</p> <p>Fusion power promises virtually unlimited, pollution free energy. Prepare a PowerPoint to explain the different ways physicists are trying to make fusion power work.</p>

The two parts will be graded A-E. In part one we will be looking for the correct answers. In part two we will be looking for evidence of research, scientific understanding and the skill of communicating scientific ideas with others. Good Luck!