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EVERYTHING SCIENCE

When we look outside at everything in nature, look around us at everything manufactured or look up at everything in space we cannot but be struck by the incredible diversity and complexity of life; so many things, that look so different, operating in such unique ways. The physical universe really contains incredible complexity.

Yet, what is even more remarkable than this seeming complexity is the fact that things in the physical universe are knowable. We can investigate them, analyse them and understand them. It is this ability to understand the physical universe that allows us to transform elements and make technological progress possible.

If we look back at some of the things that developed over the last century – space travel, advances in medicine, wireless communication (from television to mobile phones) and materials a thousand times stronger than steel we see they are not the consequence of magic or some inexplicable phenomena. They were all developed through the study and systematic application of the physical sciences. So as we look forward at the 21st century and some of the problems of poverty, disease and pollution that face us, it is partly to the physical sciences we need to turn.

For however great these challenges seem, we know that the physical universe is knowable and that the dedicated study thereof can lead to the most remarkable advances. There can hardly be a more exciting challenge than laying bare the seeming complexity of the physical universe and working with the incredible diversity therein to develop products and services that add real quality to people's lives.

Physical sciences is far more wonderful, exciting and beautiful than magic! It is everywhere.

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Well structured, impactful Corporate Social Investment (CSI) has the ability to contribute positively to nation building and drive positive change in the communities. MMI's commitment to social investment means that we are constantly looking for ways in which we can assist some of South Africa's most vulnerable citizens to expand their horizons and gain greater access to life's opportunities. This means that we do not view social investment as a nice to have or as an exercise in marketing or sponsorship but rather as a critical part of our contribution to society.

The merger between Metropolitan and Momentum was lauded for the complementary fit between two companies. This complementary fit is also evident in the focus areas of CSI programmes where Metropolitan and Momentum together cover and support the most important sectors and where the greatest need is in terms of social participation.

HIV/AIDS is becoming a manageable disease in many developed countries but in a country such as ours, it remains a disease where people are still dying of this scourge unnecessarily. Metropolitan continues to make a difference in making sure that HIV AIDS moves away from being a death sentence to a manageable disease. Metropolitan's other focus area is education which remains the key to economic prosperity for our country.

Momentum's focus on persons with disabilities ensures that this community is included and allowed to make their contribution to society. Orphaned and vulnerable children are another focus area for Momentum and projects supported ensure that children are allowed to grow up safely, to assume their role along with other children in inheriting a prosperous future.

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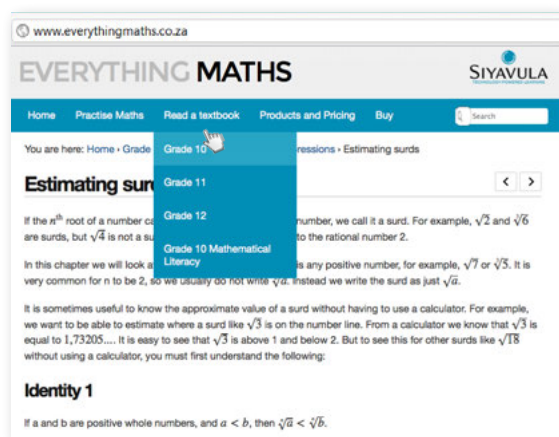
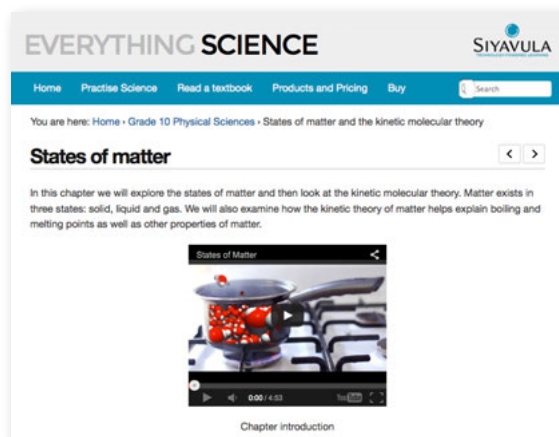


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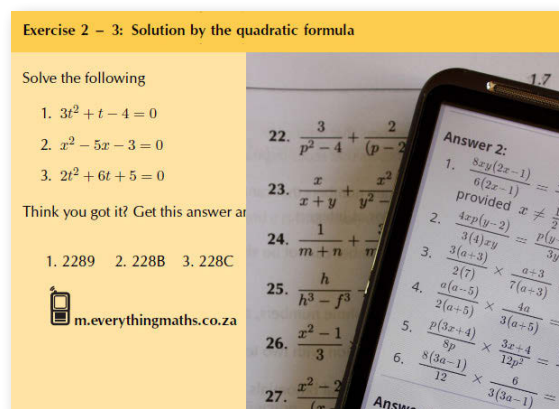
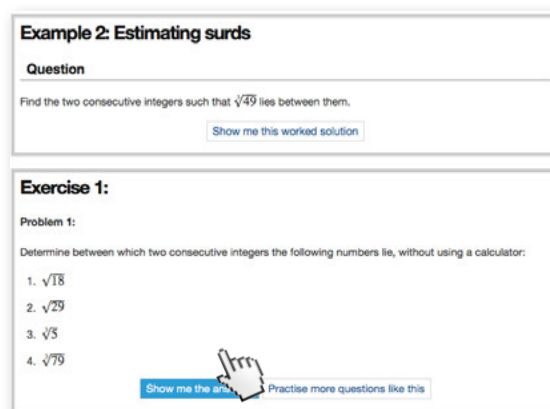
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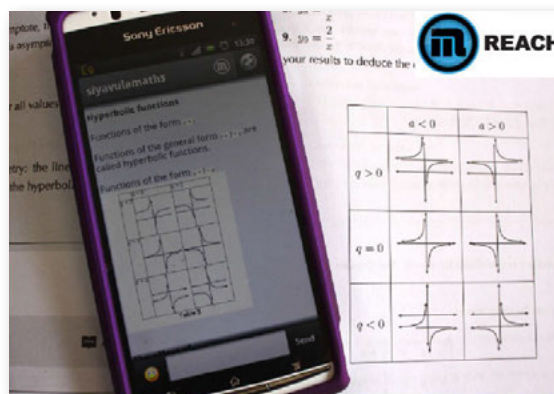
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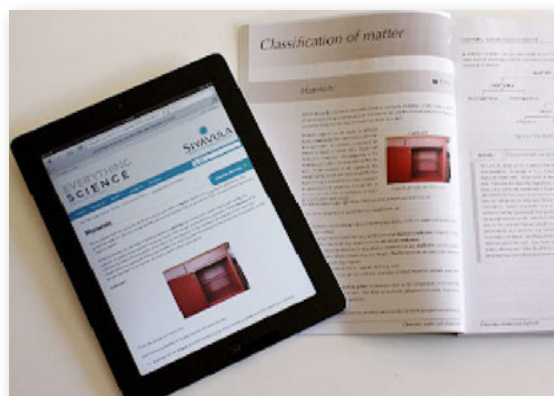
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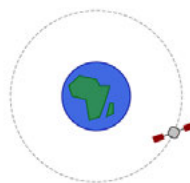
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Effect of mass on gravitational force

The International Space Station (ISS) has a mass M , as it orbits the Earth, it experiences a gravitational force of F . A space shuttle docks onto the ISS. The gravitational force the ISS experiences once the mass of the shuttle is added increases by a factor of 3.

By what factor does the mass of the ISS increase for it to experience this increase of gravitational force? Write your answer as a fraction of the original mass M_{ISS} of the ISS.

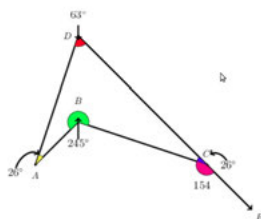


Answer: M_{ISS} [2 points] [Check answer](#)

[Help! How should I type my answer?](#)

Angles in quadrilaterals

The diagram below represents quadrilateral ABCD with extended line $\overline{CE}$. Quadrilateral ABCD is a polygon with four sides and four angles. The sum of the interior angles in a quadrilateral = 360° . Angles on a straight line like $\overline{CE} = 180^\circ$.



Wavelength and diffraction

Two diffraction patterns are presented, determine which one has the longer wavelength based on the features of the diffraction pattern. The first pattern is for green light and the second pattern is for violet light:

green



violet



The same diffraction grating is used to generate both diffraction patterns.

Answer: [Select an answer](#) [2 points] [Check answer](#)

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States of matter and the kinetic molecular theory	66 / 77	☆☆☆☆
The atom	395 / 526	☆☆☆☆
The periodic table	71 / 128	☆☆☆☆
Chemical bonding	177 / 237	☆☆☆☆
Transverse pulses		☆☆☆☆
Transverse waves		☆☆☆☆
Longitudinal waves		☆☆☆☆
Sound	100 / 139	☆☆☆☆
Electromagnetic radiation	453 / 598	☆☆☆☆
The particles that substances are made of	34 / 41	☆☆☆☆
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