



Konferenca NAK – za učitelje naravoslovnih predmetov

Ian Menzies
Education Scotland



4. konferenca učiteljev naravoslovnih predmetov – NAK 2017

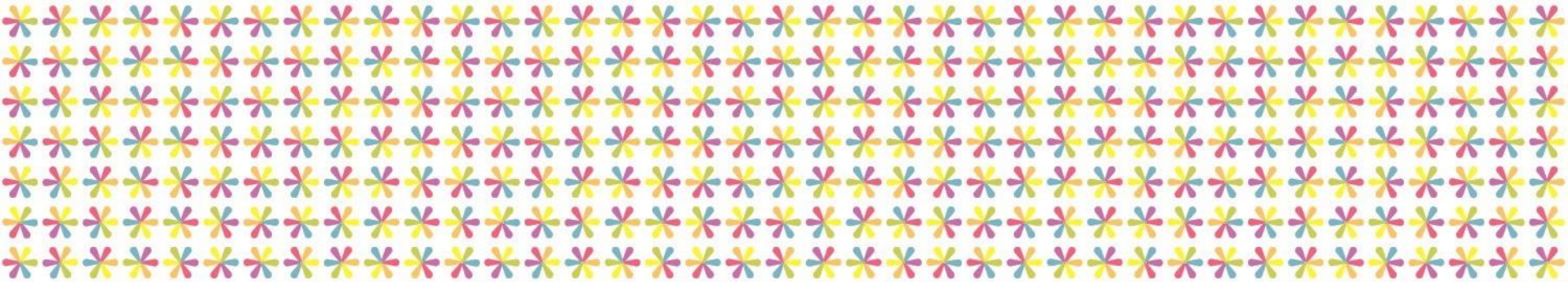


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Naložbo sofinancirata Republika Slovenija in Evropska unija iz Evropskega socialnega sklada



Scientific literacy

The beating heart of an effective science curriculum



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Scientific literacy

OECD PISA framework 2015 defines scientific literacy as: 'the ability to engage in science-related issues, and with the ideas of science, as a reflective citizen'.




Why is it important?

Weather & Climate Change

Enter search Search >

- Climate Change home
- About this resource
- Weather
- Climate
- Energy
- Climate change**
 - Global warming
 - Climate change in Scotland
 - Climate change around the world
 - Mitigation
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- Glow Group

Climate change >
Climate change



Climate change offers an ideal context for learning within Curriculum for Excellence, providing many opportunities to develop children and young people as global citizens and deliver experiences and outcomes across many curriculum areas.

Since the start of the Industrial Revolution in the late 1800s, enormous quantities of manmade greenhouse gases have been pumped into the atmosphere. Experts believe that the carbon dioxide released when fossil fuels burn has caused our world to heat up and has caused our climate to change.

Impact

Now, in the 21st century, many believe that climate change is one of the biggest challenges facing the global community. In some parts of the world, we can already see changes taking place. Glaciers and polar ice are melting rapidly and experts say there will be more flooding in low-lying areas as sea levels rise. Other parts of the world are being hit by droughts and heat waves which may also be linked to changes in the climate.

Experts believe that the things that are happening are just a sign of bigger changes

Related links

- Causes of climate change**
Visit the Learning Zone pages of the BBC website.
- United Nations**
UN Environment Programme website.
- Climate change**
News pages of the BBC weather website.
- Climate scepticism**
BBC news pages about climate scepticism.
- Climate change**
Climate change pages of the Royal Meteorological Society website.
- The Stern Report - key Points**
Guardian news website about the Stern Report.
- Low carbon partnership**
Learn more about climate change and renewable energy.

Scottish Daily Mail

STURDAY, MARCH 24, 2012 SCOTLAND'S NEWSPAPER OF THE YEAR 90p

A WHOLE LOAD OF HOT AIR!

Green lobby are accused of brainwashing Scots children over climate change claims

SCOTTISH schools are 'brainwashing' young pupils by presenting controversial climate change claims as fact, leading UK scientists warned last night.

The Scottish Government

By Hamish Macdonell

is teaching a narrow, biased view of the environment and this should be ditched in favour of a more balanced approach based on the evidence, they said.

The scientists, including one senior Scottish academic, said

the materials used by schools to teach climate change were often misleading, deliberately alarmist, and often nothing more than theories dressed up as facts.

And they warned that some claims amounted to nothing less than the "moral blackmail" of the nation's children, telling them they would be threatening the

Turn to Page 2



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Why is it important?

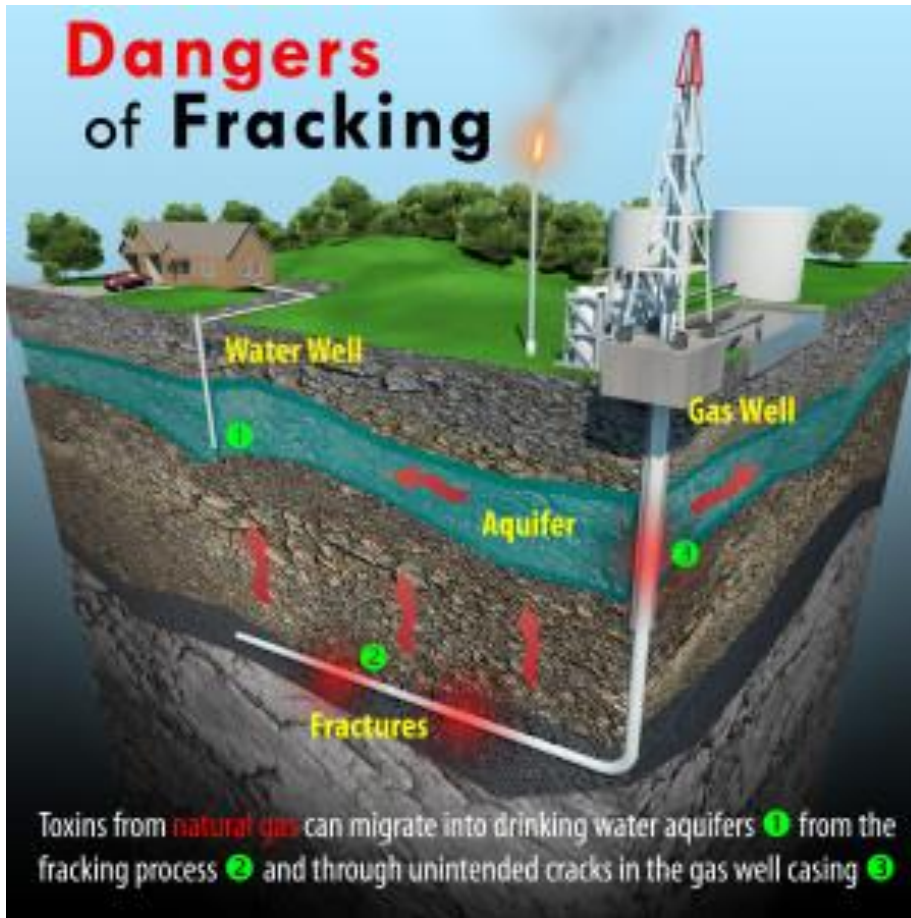


Image: <https://celdf.org/rights/issues/fracking/>



Image: [Iain Thomson](#)

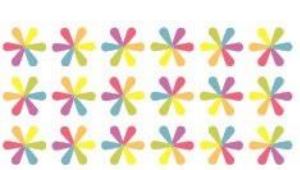


Why is it important?

Atkins diet – the big fat fake
Why the Paelo diet is half-baked
Would you try the keto diet?
Zero-calorie and gluten free
Mediterranean diet controversy
Why low-carb diets have got it wrong
Are low salt diets bad for your heart?



Why is it important?



Why is it important?



Why is it important?



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FAKE NEWS 

PLEASE NO BROWSE

Sciences curriculum - Scotland

Forces, electricity and waves

Biological systems

Planet Earth

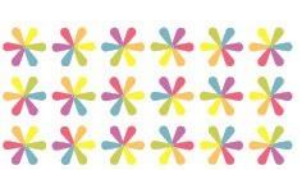
Materials

Topical science

Inquiry and investigative skills

Scientific analytical thinking skills

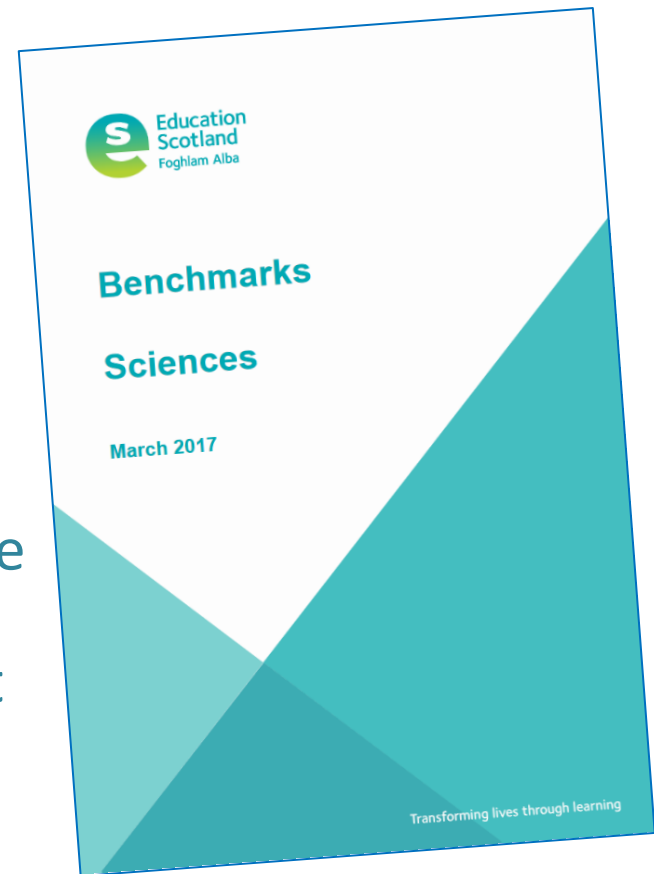
Skills and attributes of scientifically literate citizens



Science benchmarks

Early level - 3 to 5 year olds

- Talks about science and listens to the views of others.
- Respects living things and the environment.
- Manages Earth's resources responsibly.
- Develops understanding of science in the world around them.
- Explores how people use science as part of their job.



<https://education.gov.scot/improvement/curriculum-for-excellence-benchmarks>



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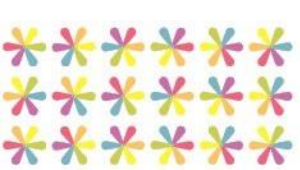


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Science benchmarks

Third level - 12 to 14 year olds

- Understands impact of science on society.
- Debates and discusses moral and ethical implications of scientific developments.
- Respects the views of others.
- Expresses informed views of topical scientific issues.
- Analyses science content in the media and presents reasoned argument on issues.
- Understands bias and can separate fact from opinion.



Science benchmarks

Third level - 12 to 14 year olds

- Researches how scientists and those who use science in their jobs contribute to development of scientific ideas
- Aware of how science and science skills are used in a range of careers including STEM careers (Sciences, Technologies, Engineering and Mathematics).
- Awareness of creativity, inventiveness and use of technologies in science.



Solar oven project

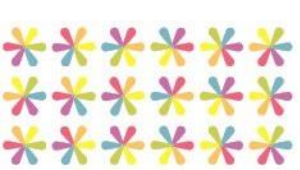
Second level 9-11years

All children should have access to clean water, nutritious food and a clean environment so they stay healthy.

Article 24, UNCRC



Image: Thomas Black57, Wikimedia Commons



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SUSTAINABLE DEVELOPMENT GOALS



Energy sources and sustainability: Children can suggest ways they can reduce their own energy use and live more sustainably.

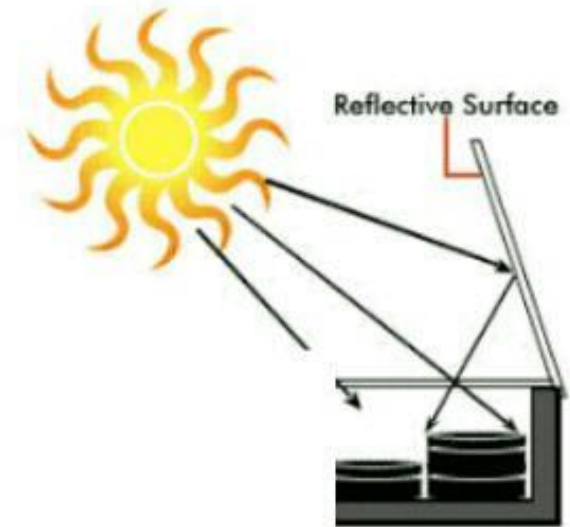


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Design brief...

- Your cooker must harness the energy from the sun to cook food
- Your oven must be lined with materials that will absorb the heat
- You must be able to keep your food hygienic and protected from bugs
- You must be able to access and clean the surface where your food will be placed (oven door)



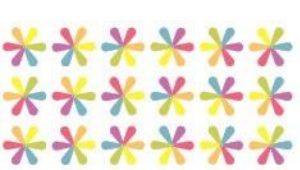


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Hurricane project

Second level 9-11years



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Meteorologist

A scientist who monitors the weather and predicts its behaviour.



Image: <http://www.tigtagworld.co.uk/>



Image: Wikimediacommons: geography.org.uk



REWRITE THE HEAD LINES



National competition for children aged 9-11 years
Critically analyse media headlines and articles
Children work with real scientists to look at how stories are reported
Looking for bias, exaggeration and inaccuracies
Lost in translation or bad science?

<https://researchtheheadlines.org/>



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NEWS

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Health

Processed meats do cause cancer - WHO

By James Gallagher
Health editor, BBC News website

© 26 October 2015 | Health |

Share



Eating processed meat slightly increases the chance of cancer



Anti-loitering device

Third level 12-14years



**PROBLEMS WITH
LOITERING YOUTH?**



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Anti-loitering device

Third level 12-14years

THE CONVERSATION

Academic rigour, journalistic flair

Arts + Culture Business + Economy Cities Education Environment + Energy Health + Medicine **Politics + Society** Science + Technology Brexit



The use of sonic 'anti-loitering' devices is breaching teenagers' human rights

August 4, 2017 12:50pm BST

<https://theconversation.com/uk>



Amy Lee Fraioli MSYP
@AmyLeeMSYP

Following

Over a week later and the Mosquito Device at Hamilton Central remains in place -
[@ScotRail](#) sort it out.



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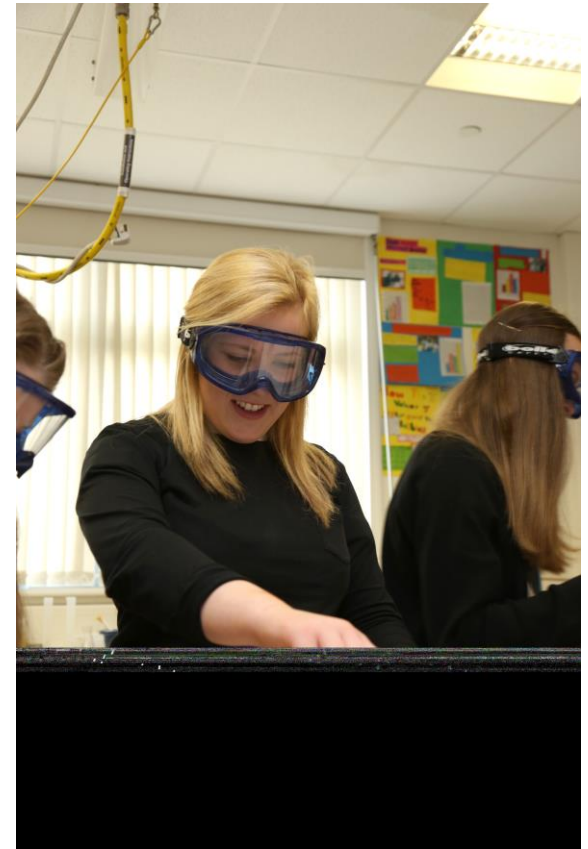


Senior phase

National qualifications – 15 to 18 year olds

Graded assignment (20% of total) requiring application of knowledge, skills and understanding to show impact of science concepts on society and the environment.

- Researching sources of information
- Gathering data including from practical investigations
- Writing report



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Exoplanets

Higher level 16-17 years

EXTRASOLAR PLANETS

Science > Space > Universe > Sights > Extrasolar planets



Exoplanets

In 1992 scientists first detected a planet outside our Solar System, orbiting a **pulsar**. A few years later, the planet **51 Pegasi B** was found orbiting a **star** similar to the **Sun**. Hundreds of these extrasolar planets, or exoplanets, have been found since.

Most exoplanets can only be detected indirectly because bright light from the stars that they orbit drowns them out. One method is to look for tiny wobbles in stars' positions caused by their gravitational interactions with orbiting planets.

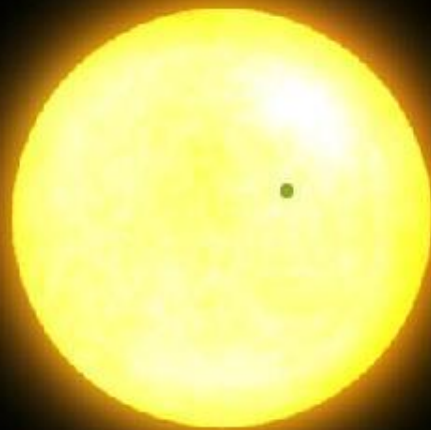
Scientists are particularly interested in planets found in their stars' **habitable zones**.

Image: An artist's concept of the planet HR 8799b (NASA, ESA, and G. Bacon/STScI)



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BRIGHTNESS

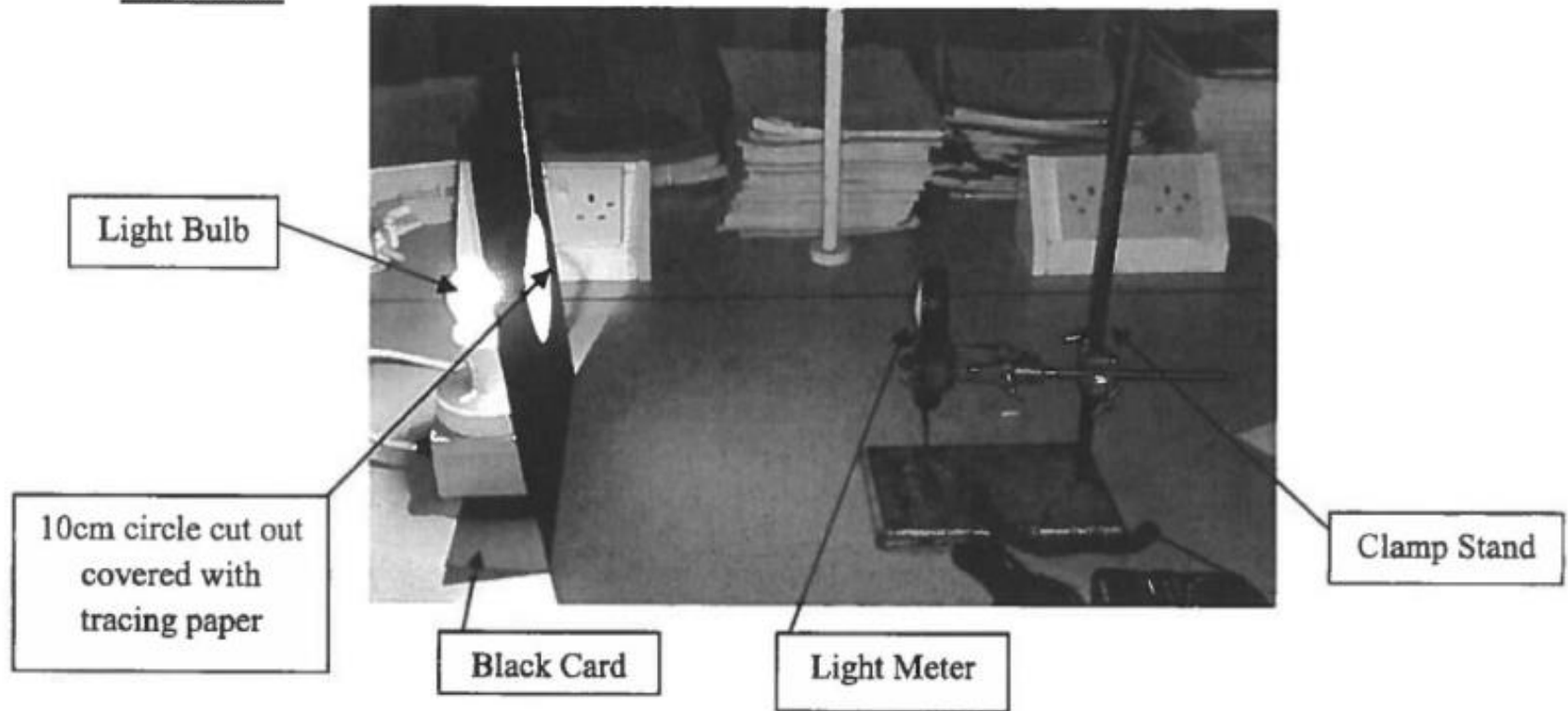


TIME IN HOURS

Experiment 2 – Stellar Brightness and the transit of an exoplanet

Aim: The aim of the assignment is to investigate how the apparent brightness of a star changes as an exoplanet transits in front of the star.

Procedure:

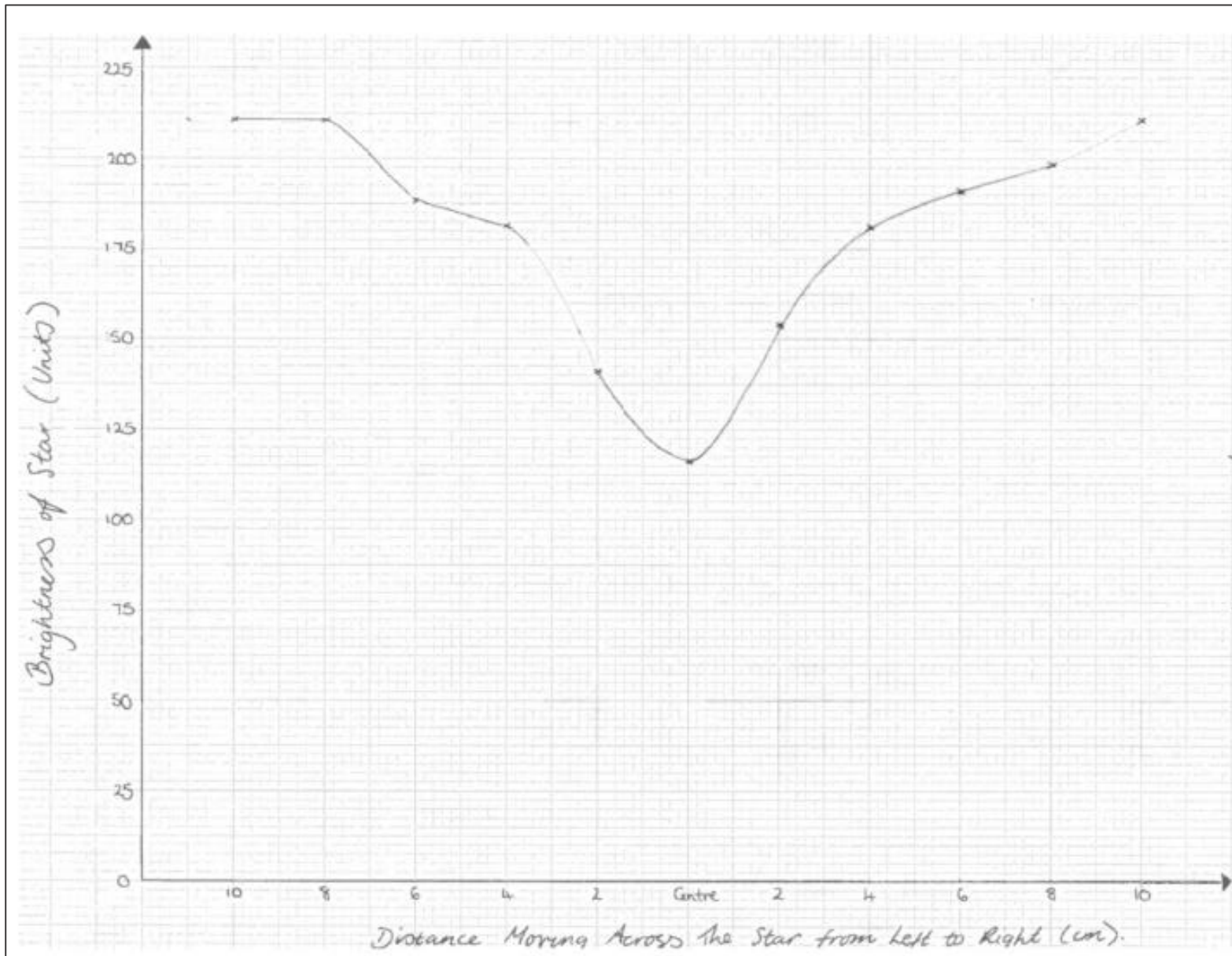


http://www.understandingstandards.org.uk/Higher_images/physics/assignment/2016/physics_H_assgn_2016_1237_evidence.pdf



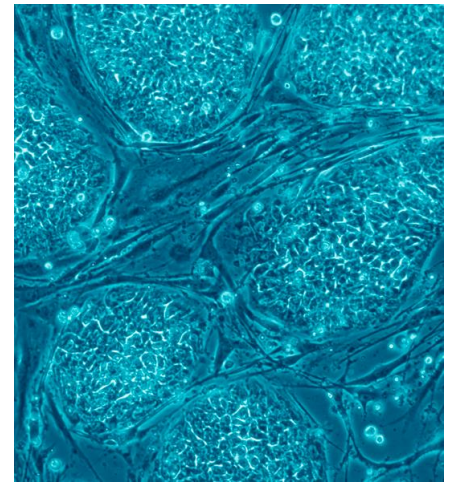
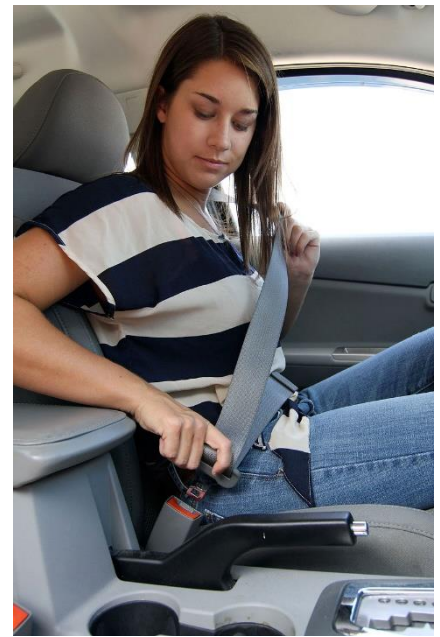
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Value-based decisions: wisdom, justice, compassion, integrity



Real-life = relevance = motivation = attainment

Skills for learning, life and work

Effective contributors, responsible citizens

Science for all not for the few

NEWS UPDATE

News update

On this week's update: creating muscles for robots, a rare gathering of polar bears, and could we travel the world by rocket?

Curriculum keywords

STEM · Animals · Transport

Explore this story >

News update

Earthquake engineers

5 facts about Halloween

About Reach Out Reporter

<https://www.twigsciencereporter.com/>



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The Debate Kits

From this page you can download all of the Debate Kits, and find further resources to use with each kit.

Make sure to **sign up** to receive copies of the latest kits as they're released!

- Mars Mission Debate Kit
- Vaccinations Debate Kit
- Antibiotic Resistance Debate Kit
- Big Data Debate Kit
- Electricity Distribution Debate Kit
- Food Security Debate Kit
- Drugs in Sport Debate Kit
- Are we too clean Debate Kit
- IVF Debate Kit
- Stem Cells Debate Kit
- Cannabis Debate Kit



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<https://debate.imascientist.org.uk/>




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Neutron stars: how they make gold in space!

21 October 2017 Last updated at 07:54 BST

Have you ever wondered how gold is made?

Well, scientists are pretty sure they now know.

Related video / audio

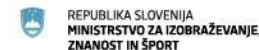
- ▶ 0:36 Sending a fidget spinner into space 14 October 2017
- ▶ 2:23 What was the space race? 4 October 2017

Best video / audio

- ▶ 6:00 Watch Newsround 29 minutes ago
- ▶ 2:55 Guns in the US: Kids tell us what they think 20 October 2017
- ▶ 1:19 'I could just fly in on my chair' 20 October 2017

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<http://www.bbc.co.uk/newsround>



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Hello to our 10188 users!

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**Activities for the
KS3 Science Syllabus**

AQA
Realising potential

Click on the images. [Login](#) to download materials.

Vitamin D

Skill: Analyse patterns topic: Digestion

This activity is designed to engage a wider range of students. Using the

Exterminate

Skill: Multiple topic: Ecosystem

Mosquitoes are the world's most dangerous killer. The diseases they

Eco-phone

Skill: Multiple Topic: Earth resources

As the number of smartphone users worldwide exceeds 2 billion,

Big Stuff Blog:

An inspiring conference, say science educators...

The ENGAGE project conference, at the Open University on March 11th, was a unique event designed to launch a community of innovative science teachers. Funded by the European Commission (EC), this event brought together more than 80 Science teachers from right across England, as well as Russia and Brazil.

<https://www.engagingscience.eu/en>



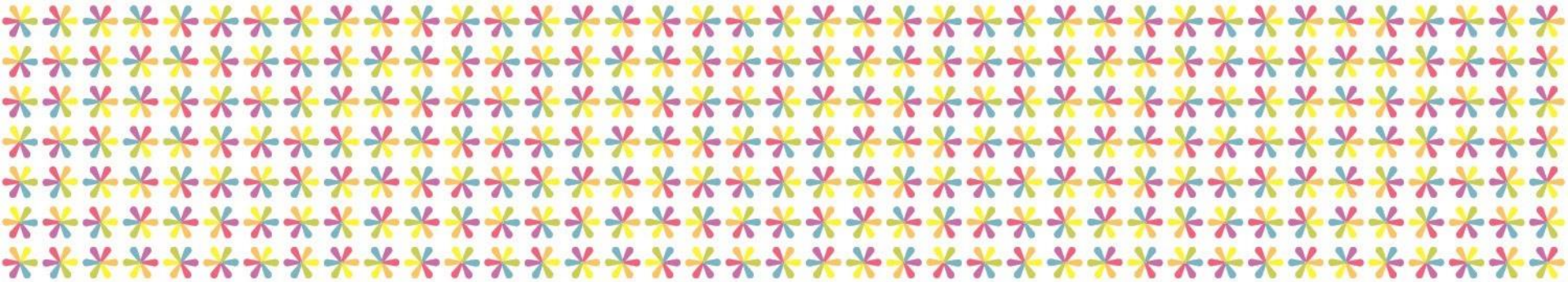
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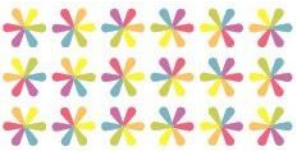


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