The RSC Ireland

Declan McGeown
Education Coordinator, Ireland

ROYAL SOCIETY OF CHEMISTRY

Meet Team Ireland

Angela McKeown

Regional Manager

Angela McKeown

Regional Manager

Heather McFarlane

John O'Donoghue

Declan McGeown

Cost?

FREE

Learn Chemistry Partnership registration

Learn Chemistry Partnership is focused on schools, colleges and teacher training providers involved in secondary through to FE levels in the UK and Ireland.

Send us an email

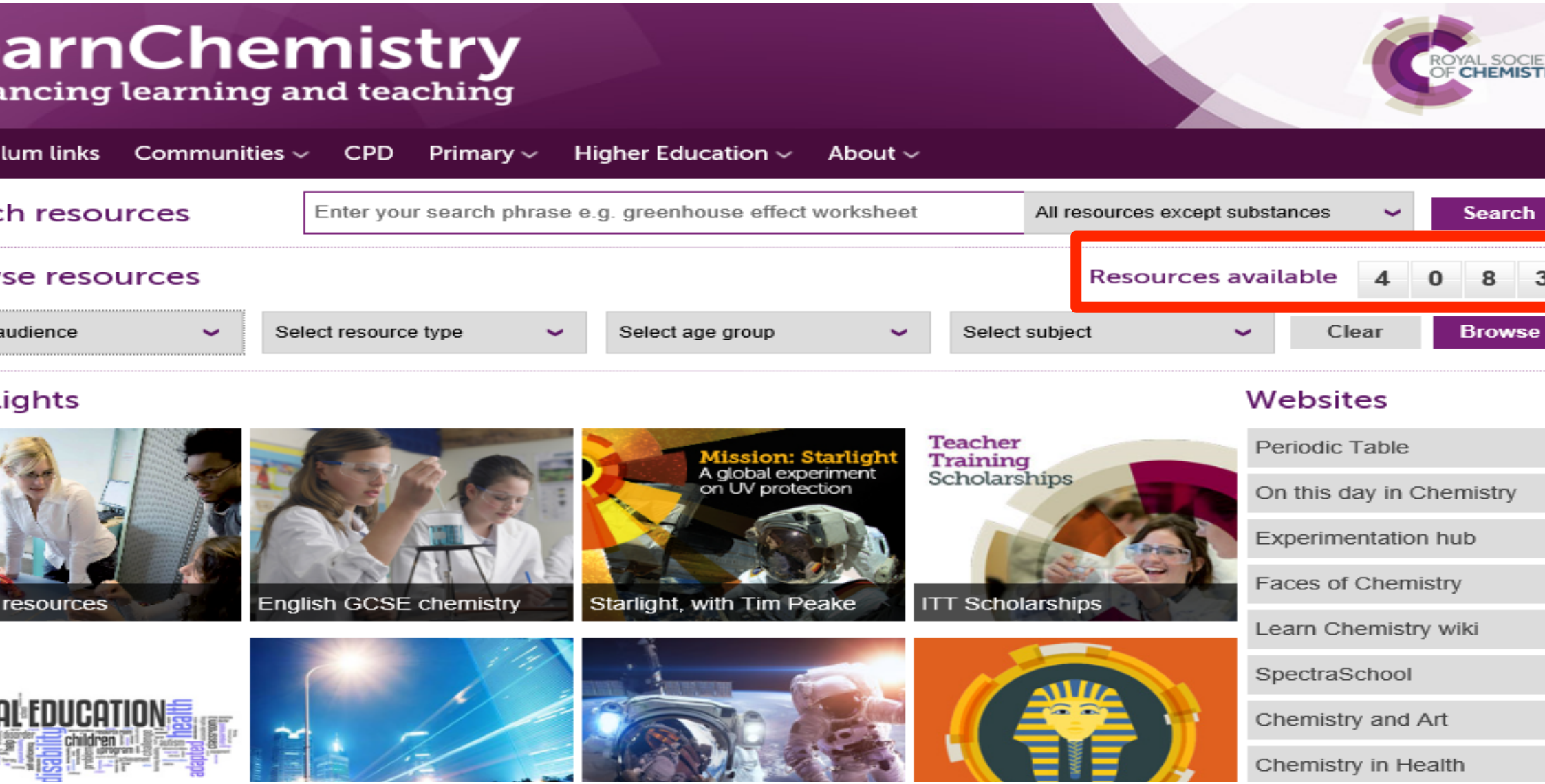
- if you think your school or college may already be registered (under your name or a colleague's)
- if you are leaving your current school and / or wish to transfer your details to your new school.

By completing this form you are registering your school for Learn Chemistry Partnership and agreeing to be the main contact for your institution. We will then send you details of how to claim your complimentary personal membership (one per school).

* Denotes a mandatory field.

Your details

Resources for Science and Chemistry



Resources for Science and Chemistry

arnChemistry
ncing learning and teaching

ROYAL SOCIETY OF CHEMISTRY

lum links | Communities | CPD | Primary | Higher Education | About

h resources

Enter your search phrase e.g. greenhouse effect worksheet

All resources except substances | Search

se resources

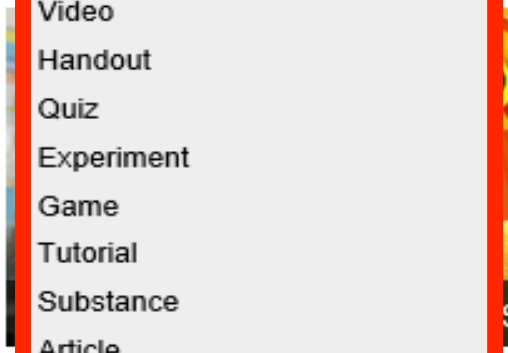
Resources available 4 0 8 3

udience | Select resource type | Select age group | Select subject | Clear | Browse

Select resource type
Presentation
Video
Handout
Quiz
Experiment
Game
Tutorial
Substance
Article
Simulation
Audio
Website
Book

ights

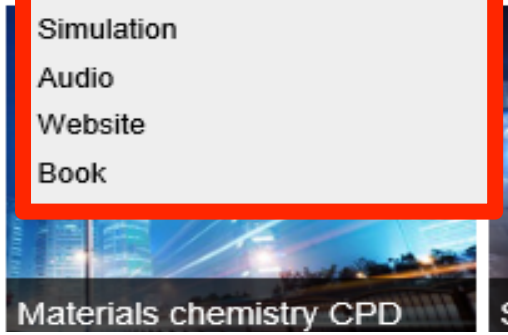

resources



Starlight, with Tim Peake

ITT Scholarships

ibility awareness


Materials chemistry CPD


Space chemistry


Science ideas webs

Websites

- Periodic Table
- On this day in Chemistry
- Experimentation hub
- Faces of Chemistry
- Learn Chemistry wiki
- SpectraSchool
- Chemistry and Art
- Chemistry in Health

arnChemistry
ncing learning and teaching

ROYAL SOCIE
OF CHEMIST

um links | Communities | CPD | Primary | Higher Education | About

h resources

Enter your search phrase e.g. greenhouse effect worksheet | All resources except substances | Search

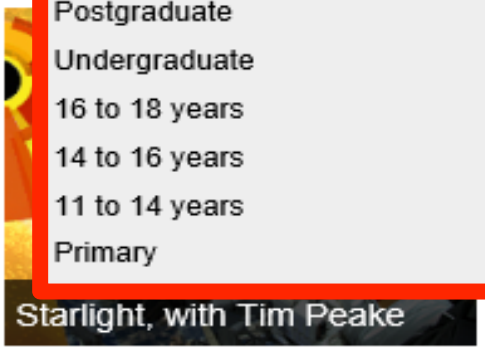
se resources

Resources available 4 0 8 3

udience | Select resource type | Select age group | Select subject | Clear | Browse

Select age group
Teacher
Postgraduate
Undergraduate
16 to 18 years
14 to 16 years
11 to 14 years
Primary

ights



Websites

- Periodic Table
- On this day in Chemistry
- Experimentation hub
- Faces of Chemistry
- Learn Chemistry wiki
- SpectraSchool
- Chemistry and Art
- Chemistry in Health

arnChemistry
ncing learning and teaching

ROYAL SOCIE
OF CHEMIST

um links | Communities | CPD | Primary | Higher Education | About

- Reversible/ irreversible change
- Everyday materials
- Solids, liquids and gases
- Earth science
- Teacher support

h resources

Enter you | effect worksheet | All resources except substances | Search

se resources

Resources available 4 0 8 3

udience | Select resource | up | Select subject | Clear | Browse

ghts


esources


English GCSE chemistry

Starlight, with Tim Peake

ITT Scholarships

bility awareness


Materials chemistry CPD


Space chemistry


Science ideas webs

Websites

- Periodic Table
- On this day in Chemistry
- Experimentation hub
- Faces of Chemistry
- Learn Chemistry wiki
- SpectraSchool
- Chemistry and Art
- Chemistry in Health

arnChemistry
ncing learning and teaching

ROYAL SOCIETY OF CHEMISTRY

um links | Communities | CPD | Primary | Higher Education | About

h resources

Enter your search phrase e.g. greenhouse effect worksheet

All resources except substances | Search

se resources

Resources available 0 1 3 1

udience | Select resource type | Primary | Select subject | Clear | Browse

ights

Websites

- Periodic Table
- On this day in Chemistry
- Experimentation hub
- Faces of Chemistry
- Learn Chemistry wiki
- SpectraSchool
- Chemistry and Art
- Chemistry in Health

On this day in Chemistry

ience ideas web: the kings

acher Primary & Teac...

jects: Teaching chemistry,Cross-icular...

utorials

Science ideas web: Ancient Egypt

Teacher Primary & Teac...

Subjects: Teaching chemistry,Cross-curricular...

2 Tutorials

Science ideas web: the Romans

Teacher Primary & Teac...

Subjects: Teaching chemistry,Cross-curricular...

2 Tutorials

ience ideas web: Maya d Aztecs

acher Primary & Teac...

jects: Teaching chemistry,Cross-icular...

utorials

Science ideas web: the stone age

Teacher Primary & Teac...

Subjects: Teaching chemistry,Cross-curricular...

2 Tutorials

Science ideas web: the Victorians

Teacher Primary & Teac...

Subjects: Teaching chemistry,Cross-curricular...

2 Tutorials

ience ideas web: Space

Science ideas web: the golden age of Islamic

Space – Ideas Web

Age range: 5–7 years

ion – eating the right foods

n space in a low gravity environment
For astronauts' bones and muscles and
eed to eat food with lots of calcium and
D to stay healthy.
v can we sort a variety of foods into
nt groups? ⑦ Which foods should we eat
of and which ones should only be 'treats'?
we make a lunch box for an astronaut?
ch foods would be most suitable in space
w best can they be stored? ⑦ What
eating food difficult in space?

ful effects of microorganisms

going into space, astronauts must stay in
tine. This is to prevent them from
g any illnesses into space and infecting
stronauts they will be living with.
v can we find out which illnesses we have
the last school term? ⑦ Can we create
gram to show our findings? ⑦ In what
an we prevent illnesses from spreading in
ss?

s and pulls

and people in space aren't affected by
the same way they are on Earth. Gravity
present in space, but the feeling of
lessness is due to the fact that they are in
o effectively in freefall around the Earth.
auts on board the ISS can't walk around,
y move by pushing themselves off from
nt surfaces.
t do we feel when sitting still on a seesaw,
or at the top of a slide? ⑦ How can we
equipment to move? ⑦ What kind of
nent do we need do do for which kind
pment? ⑦ Are there any other ways of
the equipment to move? ⑦ How can we
movement to stop?

nd edited by:

STEM LEARNING

Conditions for growing plants

There are no supermarkets in space – growing plants in space for food is important if we want to go on longer space journeys. Scientists on board the International Space Station grow plants to see which conditions help plants to grow the best. They also help tell us more about growing plants back on Earth.

⑦ How can we investigate what plants need to grow? ⑦ What is different about growing plants in space compared with on Earth? ⑦ How might this affect plant growth? ⑦ Can you find out what plants astronauts have grown on board the ISS? ⑦ Which have they been unable to grow?

Uses and properties of materials

When fixing things on the outside of a spacecraft, astronauts wear a space suit. The fabric used in an astronaut's suit needs to be strong, easy to move in, comfortable and hard-wearing, as well as being both air and water tight.

⑦ How can we investigate how stretchy different fabrics are? ⑦ Can we sort the fabrics into those that are waterproof and those that aren't? ⑦ Can we create a scale for how hard-wearing they are? ⑦ What fabric would not be suitable for an astronaut's suit? Why not?

Mixtures of materials

Some scientists believe that collisions of c
with Earth long ago may have resulted in
and organic materials being deposited on
our planet. A comet is a mixture of differe
materials, such as rock, dust, ice and froze
gases – a bit like a dirty snowball.

⑦ Can we create our own comet models
⑦ What could we use to represent the di
materials in the comet? ⑦ What changes
you noticed when you mix the different p
together? ⑦ Can we make a drawing to
our observations?

Comparing and grouping rocks

When rocks from space fall through the E
atmosphere, the air around them gets so
that it glows. This is the streak of light we
a shooting star. Smaller rocks completely
apart while falling, but larger ones can lan
on the ground. These 'space rocks' are ca
meteorites.

⑦ What other rocks do we know? ⑦ Can
observe and then describe them? ⑦ How
we sort them into different groups? ⑦ W
different kinds of rocks can we find in and
around the school? ⑦ How can we find
more about meteorites?

BIOLOGY

CHEMISTRY

SPACE

PHYSICS

Seasonal Change

From space, satellites record the change of seasons around the world. They send images showing snowfall, temperature and rainfall at different times of the year.

⑦ In which seasons can we play in the park after school? ⑦ Can we count the number of leaves found in the playground on one day in each month and create a pictograph to show the results? ⑦ Do the seasons change in the same way in other places around the world?

Light sources

The sun is our nearest star and our greatest source of light. During the night the part of the Earth that we are on is facing away from the sun, which means it is dark outside and we rely on other sources of light to be able to see.

⑦ Which light sources can we identify? ⑦ Can we order them from dullest to brightest? ⑦ Which sources of light help us to see at night? ⑦ How can we show that we need light in order to see?

ROYAL SOCIE
OF CHEMIST

Space – Ideas Web

Age range: 7–9 years

needs of animals and humans

t gravity, fluids inside astronauts' bodies
ove around in the same way they do
h. This fools the body into thinking it is
too much water, so astronauts have to
t. If they don't drink enough water to make
his, they become dehydrated quickly.
cannot function properly without water.

v could we find out the amount of water
k each day? ⑦ Could we do this survey
week? ⑦ What colour urine means that
well hydrated? ⑦ What colour means
u are dehydrated? ⑦ Can you record
ydration levels over 12 hours to see how
ed you are?

y life choices

h, all our muscles and bones are working
gravity and keep us fit (even if we might not
e as much as we should). Because astronauts
ghtless in space, they need to exercise
y to keep their muscles and bones healthy.

v can we investigate the effect of
t kinds of exercise on the body? ⑦ Can
p an exercise diary for a week to see the
f activity we perform regularly? ⑦ Can
y out activities that help to build strength
-ordination? ⑦ What do astronauts do
fit and healthy on the ISS?

nd shadows

acesuits astronauts wear when outside
ace craft have a specially designed gold-
sor, which they can see through but which
too bright sunlight to protect their eyes.

v can we find out which materials are
t reflecting light? ⑦ Can we create a table
v this? ⑦ Are some shinier than others?
t equipment would we use to measure this?

nd edited by:

STEM LEARNING

Habitats and environment

Satellites orbiting Earth allow us to see different habitats, from the polar regions to tropical rainforests. Photographs of the Earth taken from space over the past thirty years help scientists identify how environments have changed and how this may sometimes pose a threat to plants and animals.

⑦ Can we list of different habitats in the world? How many animals do we know that live in one of these habitats? ⑦ How many different ways can we sort these animals into groups? ⑦ Why have you sorted them in this way? ⑦ Which animals are threatened or endangered species? ⑦ Can we research why a species has become endangered?

Separating mixtures

Astronauts living on the International Space Station need water for many things including washing and drinking. Fresh water is in short supply in space, so waste water is recycled on the space station by separating the fresh water from the dirty water.

⑦ What can you use to separate large solid particles from a liquid? ⑦ How can we separate smaller solids from a liquid? ⑦ Can you separate a mixture of sand, marbles and water? ⑦ How could we separate dissolved substances (such as salt)) from water? ⑦ Can you find out how waste water is recycled on the ISS?

Changes of state

As Mars is too far away for people to go th
Nasa scientists have sent robots to investig
the planet. It is very cold on Mars, so there
no liquid water but the robots have found
Scientists think that it was a lot warmer on
thousands of years ago and there might ha
once been large seas.

⑦ How can we observe and record the ch
when ice melts? ⑦ Does temperature affe
the rate at which ice melts? ⑦ How could
investigate this? ⑦ Can we find out if diffe
frozen substances melt faster or slower?
⑦ Which other liquids could we freeze an
observe the resulting solids? ⑦ Do they h
different freezing point?

Uses and properties of materials

Satellites need to be made of materials tha
able to withstand very high temperatures.
need to be good at transferring heat, via th
conduction, from the hot side pointing tow
the Sun, to the cold side facing out into sp

⑦ Can we create a table to see which mat
heat up and cool down quickly and which
don't? ⑦ What other properties of materi
you would be important on a satellite? ⑦
do you think satellites aren't made of very
materials? ⑦ How would you investigate
theory?

BIOLOGY

CHEMISTRY

SPACE

PHYSICS

Air resistance

The descent module which brings astronauts back to Earth from the ISS has a specially designed parachute that opens after the module has entered the atmosphere. The parachute helps the module to land safely.

⑦ How can we investigate how the size of a parachute affects the descent of an object?
⑦ Which other factors could we investigate?
⑦ Could we represent our findings as a graph?
⑦ Why do spacecraft need to land as slowly as possible?

The Earth, sun and moon

The International Space Station orbits the Earth very quickly, completing a circle every 90 minutes or so. During this orbit it passes through the shadow produced by the Earth blocking the sun's light. Astronauts see sixteen and sunsets and sunrises each day as they pass into and out of the Earth's shadow.

⑦ Can we show how shadows are formed? ⑦ How can we observe shadows changing over the course of a day? ⑦ What is the best way to represent out findings? ⑦ Can we create a model to explain why we have day and night?

ROYAL SOCIE
OF CHEMIST

Space – Ideas Web

Age range: 9–11 years

n circulatory system

rockets launch, astronauts' bodies ence a lot of high forces, which makes er for their heart to pump blood to ain. Astronauts sit inside the rocket in a d position so they are less likely to faint as egin their ascent.

we measure our heart rate before and ercise? ⑦ How could we measure heart covery after exercise? ⑦ What would be way to present our results?

ul effects of microorganisms

ial growth was found on the Mir Station sult of increase in temperature and poor ion during a period when the electrical failed. Astronauts must clean spacecraft ly to prevent the harmful bacteria and s growing and spoiling their food.

v can we compare how different foods over time? ⑦ How can we see which ons affect the growth of mould on ⑦ Can we find out if other materials ected by micro-organisms? ⑦ What ons promote their growth? ⑦ How think astronauts prevent the growth of organisms such as mould on a spacecraft? you think of all the ways in which this affect the spacecraft and the crew?

s of gravity

Neil Armstrong walked on the moon, nced along as the gravity moon is a lot than the gravity on Earth. This means that ght was less on the moon than on Earth, his mass was the same.

you find out which planet of the solar you weight least on? ⑦ Would your be more or less on Mars? ⑦ Can you your findings in a table? ⑦ What would eight be on Comet 67P?

nd edited by:

STEM LEARNING

Habitats and environment/ Adaptation and evolution

Astrobiologists investigate life deep below the surface of the Earth, looking at organisms that live in extreme conditions such as hight temperatures, highly acidic or saltily environments. This helps them judge whether life might be possible on other planets.

⑦ Can we list animals found in various habitats in our local area? ⑦ Do they have features which help them to survive in a particular habitat? ⑦ Looking at images of animals found in eg desert orpolar regions, can we create a list of features of these animals? ⑦ In what way do specific features help animals survive in a particular habitat? ⑦ What features would we expect life on Mars to have?

Global UV experiment

It is important to wear sunscreen when you go out in the sun because the UV rays in sunlight can damage your DNA and cause sunburn and skin cancer. In space, astronauts have to be even more careful to protect themselves from UV light, as they are not protected by the Earth's atmosphere.

⑦ How can we investigate the best sunscreen at blocking UV light? ⑦ Can we order them from worst to best? ⑦ How do your results compare to the manufacturers' rating?

Changes in materials

Satellites orbiting the Earth have large solar panels, which create electricity from the su light. When launching a satellite the solar p are still folded up. Once in orbit, the panels unfolded by heating a material on the back panel, which expands and moves when hea

⑦ How can we use thermochromic paper to investigate which materials have good thermal conductivity? ⑦ Can you think of applications for thermochromic materials everyday life?

Reversible and irreversible changes

Mars is known as the red planet as it appea when viewed through a telescope. The rob Nasa sent to Mars found iron oxide or rust causes the red colour.

⑦ Can we find out which materials rust? ⑦ What factors cause rusting? ⑦ How can investigate this? ⑦ How could we compare length of time different objects containing take to rust? ⑦ What could we do to preve materials from rusting? ⑦ Can we investiga liquids other than water cause rusting?

BIOLOGY

CHEMISTRY

SPACE

PHYSICS

Contact forces

Mars has many craters that have been formed by meteorites. The larger, heavier and faster the meteorite, the bigger the crater it creates when it crashes into the planet.

⑦ Can we investigate how the size of different objects affects the size of a crater? ⑦ How can we measure the size of the craters? ⑦ How can we find out if the surface a meteorite lands on affects the size of the crater? ⑦ Can we present our findings as a graph?

Prisms and the spectrum

Satellites use prisms to split the light of of far away stars into their components, to find out which colours of the spectrum they contain. This helps scientists to find out what these stars are made of.

⑦ Can we investigate what happens to light when it passes through a prism? ⑦ What happens if we pass it through a second prism? Why is this? ⑦ Does the same thing happen when we pass light through a glass of water? ⑦ Can we create a rainbow-coloured spinning top and see what happens when we spin it? Why do you think this happens?

ROYAL SOCIE OF CHEMIST

Science investigation in schools

Rates of reaction

Fair Test

Keep it simple

What do I change?

What do I keep the same?

What do I measure?

ROYAL SOCIETY OF CHEMISTRY

RS•C

29. Rate of reaction – the effects of concentration and temperature

Topic

Kinetics.

Timing

30 min.

Description

Students react potassium iodate and a starch solution. They vary the concentration and temperature to affect the reaction time.

Apparatus and equipment (per group)

- Two 250 cm^3 beakers
- Water bath (or some means of warming solution A).

Chemicals (per group)

- Solution A – 4.3 g of KIO_3 per dm^3 (**Oxidising solid**)
- Solution B – starch solution

Make the starch solution as follows: Make a paste of 4 g of soluble starch in a small amount of warm water. Slowly add 800 cm^3 of boiling water. Boil for a few minutes then cool the solution. Add 0.2 g of sodium metabisulfite ($Na_2S_2O_5$) (**Harmful solid**). Add 5 cm^3 of 1.0 mol dm^{-3} sulfuric acid (**Irritant**). Dilute to 1 dm^3.

Teaching tips

The colour change takes about 5–6 minutes. A colorimeter sensor or a light sensor set up as a colorimeter can be used to monitor colour change on the computer. The result, in the form of graphs on the computer, provides very useful material for analysis using


dreamstime.com


POPPING GOOD CHEMISTRY

Effervescence

Factors related to the reaction

Temperature

Surface Area

pH of the solution

Concentration of

Changing the amount of tablet: the skill of prediction

What do you think would happen if we add two tablets was used instead of one?

Why?

What do you think would happen if we added half a tablet?

Why?

diction:

Table to show the changes in time for lid to be pushed off when the amount of tablet is changed

nount of ablets	Time (s) Attempt 1	Time (s) Attempt 2	Time (s) Attempt 3	Time (s) Possible Spare Attempt	Average tin

Conclusion:

ROYAL SOCIETY OF CHEMISTRY

17

rsc.li/1

What happens if our predictions are wrong?

we get closer to the

ROYAL SOCIETY OF CHEMISTRY

Answer

ROYAL SOCIETY OF CHEMISTRY

Conclusions

Pupils are:
More engaged
Having fun
Learning
Having fun
Accessing science
Having fun
Starting science career / literacy
Having fun

ROYAL SOCIETY OF CHEMISTRY

Cambridge
Thomas Graham House

London
Burlington House

www.rsc.org

- Connecting you and your school with the world's leading chemistry community – for FREE.
- Complimentary RSC membership for the main school contact, and discounted membership for other teachers at the school
- Free *Education in Chemistry* and *The Mole* magazine
- Learn Chemistry Partnership e-newsletter
- Discounts on face-to-face CPD courses for all teachers at an LCP school
- Free Spectroscopy in a Suitcase Workshops.

The Global Experiment

Space Week 4th – 8th Oct

Global Experiment 2016 – Mission Starlight

This year's experiment is all UV light and blocking harmful rays for an astronauts visor.

There are 5 parts and it is ideally suited to Transition Years.

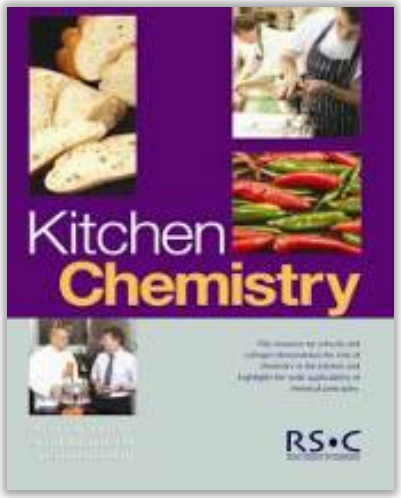
The materials are very cheap (UV beads available on amazon for €1 and UV lamps costing about €5)

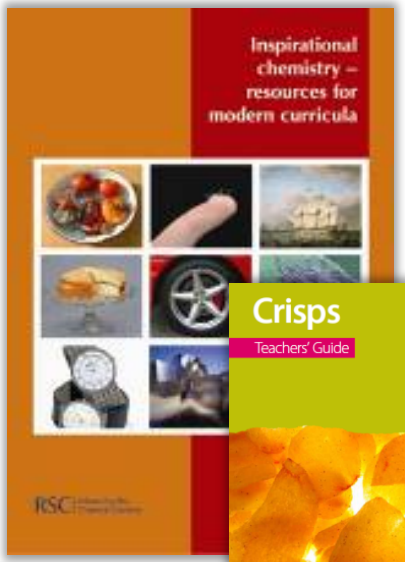
http://rsc.li/ge-starlight

Support: Curriculum Materials

- Publications
- Books
- Leaflets
- Magazines

- Classroom materials
- Posters
- Presentations
- Experiment materials
- Prizes for competitions

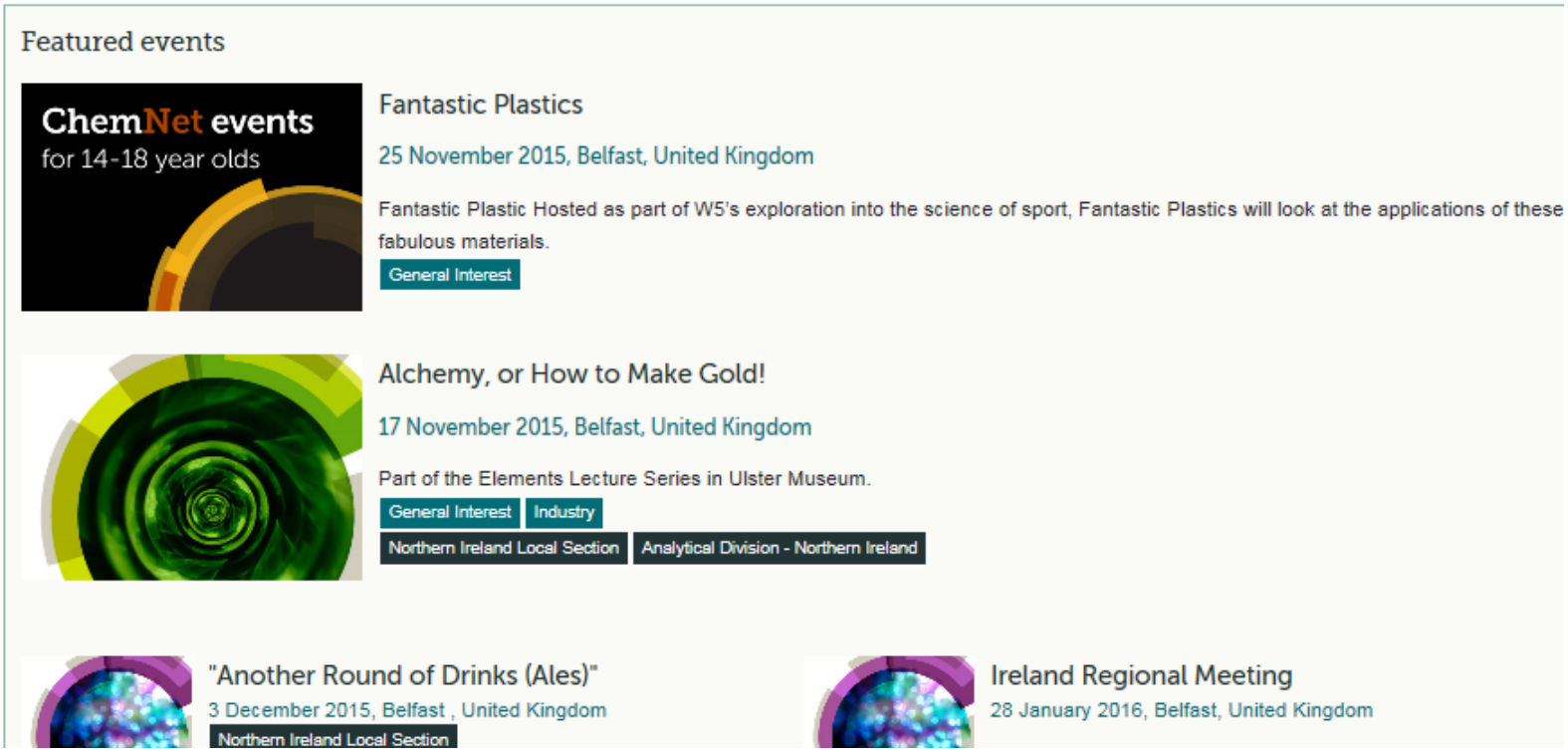




- Request by e-mailing education@rsc.org
- **OR**
- Search on the Learn Chemistry Website
- **OR**
- Email John O'Donoghue (john.odonoghue@tcd.ie)

http://rsc.li/learn-chemistry

RSC Events Page



Upcoming Events:

- GeoChem SIAS workshops UCD 14th November
- Careers in Chemistry TCD 15th November
- Careers in Chemistry UCC/Tyndall 16th November

http://www.rsc.org/events/

Thank you

Who to Contact/Social Media

Main Education: education@rsc.org

Education Coordinators for Ireland:

Declan McGeown & John O'Donoghue

Email: d.mcgeown@qub.ac.uk,

Phone: 0044 79 1277 8451

Email: john.odonoghue@tcd.ie

Phone: 00353 87 183 2911

Twitter: @RoySocChem
@Johndhodonoghue

http://rsc.li/learn-chemistry