

Spot of Science and nature anyone?

ALL subject to supervision by parent or guardian don'cha know ☺ (v. 4.0 100420)

The following was typed up for a school newsletter but most of them could be tried by anyone. MJG

(1) If you don't already **feed the birds** – what a great time to start! Even if you don't have nut feeders you can put out a tray of SEEDS on a table or wall or balcony or wheelie bin. For example finches, robins, blue tits, great tits and sparrows love black sunflower seeds - among other varieties.

(2) **Photo competition:** Adapt for garden birds or plants or garden biodiversity in general. If you have bird feeders – one or two family members could start a photographic exhibition – preferably zooming in for closer views. A few families or classmates can link up on the web – Judging panel could be parents. Prizes could include nice CERTIFICATES like the ones Mr. Stuart Wheeler created for Science awards. Prizewinners could also re-enter bigger Photo competitions in the future.

(3) **The Backyard birdsong beat.** [Especially while there is less traffic noise than usual !] Use your phone. Start a voice recording and leave the phone on a wall for a minute or two. Trim the recording to say 30 seconds of the best. Send your 30-second recording to an adjudicator. (maybe whichever parent or grandparent knows a bit of ornithology – or music !)
I'm told the BBC have done a similar competition – called “TWEET of the day” ☺

(4) **CHROMATOGRAPHY** (“Colour writing” from the Greek) : Not just a powerful forensic science and pharmaceutical industry technique – Chromatography is also colourful fun in the kitchen.

You don't need lab chromatography paper – First try different types of kitchen roll, coffee filters and other tissues – if toilet paper is not too precious.

Steps :

(a) Find a paper which draws water up slowly when one edge is dipped in a saucer of water.

(b) Cut a dozen or so strips of your absorbent paper about 10 or 12 cm long and narrow enough to hang in a jam-jar.

(c) Use water-soluble markers or food colouring to place a match-head sized spot of INK at least 2 cm from the end of each strip.

(d) Hang each strip in turn, ink spot downwards, in a glass or jam-jar with a little water in the bottom, making sure your ink-spot is *above* the water.

(e) Enjoy observing this while the water rises and discover what happens to each of your samples of ink. Black, brown and other dark inks may surprise you more.

(5) Q: How far do you have to go to see the World's most expensive Science Laboratory ?
A: Your own door.

Note the International Space Station will not be visible over Ireland England again until at least April 30. Check heavens-above.com.

Backyard satellite spotting. Most people's favourite is the International Space Station, ISS, on a clear night when it does a VISIBLE PASS that you can watch from Ireland. For INSTRUCTIONS see pages below – Also NASA have their own ISS Home page here – and get to know the current crew of three astronauts.

https://www.nasa.gov/mission_pages/station/main/index.html

(6) For **HUNDREDS OF PAGES OF SCIENCE EXPERIMENTS** you have *free access to four volumes* of the booklets from the **SCIENCE ON STAGE IRELAND** team. Part of an EU project since 2001. Just click on any of the four links you see below the book covers at this page:

<http://www.scienceonstage.ie/resources/>

Thanks to Paul Nugent (IOP and Santa Sabina) and Eilish Mc.Loughlin (DCU) and the whole team for these and for IOP Ireland Physics Busking.

(7) A couple of these experiments from "Science Sparks" might be worth trying by *younger scientists* - under supervision of course! <https://www.science-sparks.com/brilliant-chemistry-experiments/>

(8) A long but entertaining Chemistry lecture for Children from the Royal Institution. You can watch in shorter doses ! Andrew Szydlo may sound a bit formal or Edwardian in style but **enjoy the blazing experiments!** : <https://www.youtube.com/watch?v=0g8lANs6zpQ>

(9) Indeed you have access to many many hours of the **CHRISTMAS LECTURES** at the wonderful **Royal Institution** (Where Michael Faraday started them in 1825. He and Humphrey Davy changed the world with their historical discoveries in chemistry and electromagnetism. It's all available at :

<https://www.rigb.org//christmas-lectures/>

ASTRONOMY FOR BEGINNERS: With thanks to Astronomy presenter **John Flannery** of eminence in Dunsink Observatory, the Irish Astronomical Society (1937) and The People's College : See suggestions (10) to (15)

(10) See John's astronomy tweets : @TheSkybyEye

(11) John in turn recommends **VIRTUAL ASTONOMY CLUB** on Dave Eagle's twitter account.

(12) What's in the sky tonight ? You have a free **live PLANETARIUM in your home** by visiting :

<https://stellarium-web.org/> There are versions available for iOS and Android devices as well.

(13) A monthly PDF of what you can see in the sky can be downloaded from

<http://skymaps.com/>

(14) If you join <https://www.librariesireland.ie/elibrary/emagazines> They can send you FREE the **The BBC Sky at Night Magazine** every month – and MANY other periodicals as well.

(15) John also tells me that Galwayman Shane Hastings has a list of free digital services now available for families. See: @ShaneHastingsIE Shane’s list and more are also at: <https://www.image.ie/life/free-services-covid-19-shane-hastings-187336>

(16) The **National Geographic Society** - has a website for young children. Here's a link to the part which suggests about 18 easy home science experiments - Junior material. The website has loads of activities in other subjects too.

<https://kids.nationalgeographic.com/explore/science/science-lab/>

(17) Worst or best Maths and Science jokes – Here’s one a mathematical cousin “Card Colm” got from his daughter : “ I challenged 1 to a fight. He brought 3, 5, 7, and 9 along with him. It was then that I knew the odds were against me.” (I think however that 2 can play at that game and other responses are possible about getting even etc.)

(18) UCD Physicist SHANE BERGIN has been presenting a wealth of Maths Puzzles and Science Experiments on the Sean O’Rourke programme on Radio 1 - He described 14 suggestions on Tues. March 31 at about 11.45 a.m. in case you’d like to find Shane in the Sean O’Rourke Programme on the Radio Player.

Below is a more detailed note on Backyard Satellite Spotting for CLEAR night: How to find the dates and times to watch satellites in Ireland’s sky at YOUR location.

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Spot of Satellite spotting, anyone?

(v. 0.2 on 260320)

All you need is a clear Irish sky ☺ and the right timetable. Both free of charge.
Oh – and the best optical instrument is the **wonderful human eye**, Mark 1.0

Luckily the perfect timetable is available, free of charge, courtesy of Chris Peat, at www.heavens-above.com

Even on the home page you see a globe showing where on earth the ISS is NOW.
(Why do you think it spends a lot of time over oceans – especially the pacific?)

You need to tell the Heavens-above website where you are observing.
Do this by using “**Change observing location**” near the top of the home page. ⚙⚙
e.g. Type in: Terenure, Dublin, Ireland. (Not one of the 18 or so Dublins in USA !)

Many people’s favourite satellite is the **International Space Station, ISS**, which is very bright, easy to see and always has at least three crew members on board. Currently, in March 2020, on Expedition 62 the ISS crew are : **Jessica Meir, Andrew Morgan and Oleg Skripochka**. (Homework: Find their picture and who is the Commander?)

The ISS flies across the sky in about 4 minutes and you *won't* need a telescope.

On the left of the Heavens-above screen find “**Satellites**” then “**10 day predictions for satellites of special interest**” and then click on ISS. It looks like this :

Satellites

[ISS Interactive 3D Visualization](#)

[Dynamic 3D display of all objects from a single Starlink launch](#)

[Interactive Animation of Tesla Roadster Trajectory](#)

[Sighting opportunities for the BepiColombo Earth Flyby on April 10th](#) **NEW!**

10-day predictions for satellites of special interest

[ISS](#)

You are rewarded with a table of dates and times when the ISS is visible from your location if the sky is clear.

The main thing is BRIGHTNESS and here the MINUS numbers are very bright :
e.g. -3 is brighter than -2 which is brighter than -1 which is brighter than 0.

The ISS moves quickly past the background stars getting brighter at first. Then, often about 3 minutes later it may quickly fade and disappear into the Earth’s shadow.

When you go outside a few minutes before the start time you may first see the extremely bright planet VENUS high in the West. **Venus is usually the second brightest Night-Sky object** with a brightness around -4 (A full Moon would be even brighter of course, at around -12.)

See DISTANCES note below about the the Earth's surface, the ISS, the MOON and VENUS.

The ISS usually rises in the WEST or South West - but it may be well above the horizon when you spot it. Have fun competing to see who is FIRST to see it moving, point at it and say "There it is."

When the ISS fades you could run back indoors and watch the globe on Heavens-above to see where it is NOW, crossing Western Europe in a few minutes and maybe over the Indian ocean in – guess how many minutes.

Choose **VISIBLE** passes, not "all passes". You won't see it in the daytime !

You can also use a cool **simulated** interactive view from above the ISS by clicking on :

[ISS Interactive 3D Visualization](#)

Here you can "fly" above the ISS and change your viewpoint with your mouse left button and wheel. Over land you see a simulation of the terrain – even if the real view would be cloudy.

Another **brilliant site for loads more information** about the ISS is from good ol' NASA : This wonderful NASA site tells you all about the Station, its current crew and even LIVE streaming . . . you may occasionally hear the astronauts communicating with an earth station – in English or Russian. Go to :

https://www.nasa.gov/audience/foreducators/stem-on-station/know_station

Some other sites on satellites are :

<https://www.space.com/6870-spot-satellites.html>

<https://earthobservatory.nasa.gov/features/OrbitsCatalog>

Use CTRL/click to follow any of these links.

And many thanks to PHYSICIST and Presenter MARK LANGTRY (of RTE Television and EXPLORIUM distinction) for the following : "Some great sites there. Heavens-above is great. Here is a site I think you will

like: <https://spotthestation.nasa.gov/sightings/view.cfm?country=Ireland®ion=None&city=Dublin#.XngA96j7SM9>

It's really great for general information about the ISS, and it also has lovely info for spotting it in Dublin, with times etc. . . You can even sign up for texts alerts to your mobile when it's passing overhead!" **Thank you Mark.**

DISTANCES NOTE: People often ask How far the Moon and VENUS are compared with the ISS whose height is only about 400 km. So here is a comparison :

The Moon is more than 900 times further than the height of the ISS. (Average distance to the Moon is approximately 9.5 times around the equator). Venus, even at its very *nearest* to the Earth would be be over 90,000 times further than the height of the ISS.

So you can see that the BEGINNING of space is surprisingly near – and then it goes on a LONG LONG way.

DISTANCES in space would be a great exploration for another day.

LOOK UP and Have fun.

Clear skies! Michael Grehan, March 2020.