Red Cross Parcel version 4

In my family, a red cross parcel was full of practical things to help someone in need (probably came from my mum’s experiences during WWII).

So these are some ideas for science lessons for students learning from home.

Past versions – version 1 Aug 2020, v2 Feb 2021, v3 Feb 2022 – all available [here](https://drive.google.com/drive/folders/1Bsuchn971k_bOyo0DqZpNLs59yHtv2TC?usp=sharing)

Biology

* + Ask students to make observations from a live touch pool camera at the NZMSC <https://www.youtube.com/watch?v=XP1xYlNQZws>
  + Use videos from this unit on B3.5 evolution <https://sites.google.com/hornby.school.nz/aysciencesite2021/year-13/3-5-speciation>
  + Book a virtual visit to Maungatautari our largest fenced sanctuary, sessions tailored to support your needs. $50. <https://www.sanctuarymountain.co.nz/educate-us>
  + In [PhET's **Natural Selection** simulation](https://phet.colorado.edu/en/simulations/natural-selection) students explore changes to environmental factors related to a population of rabbits, tracking & graphing their outcomes.
  + An [activity](https://www.stem.org.uk/resources/elibrary/resource/35391/evolution-darwins-finches-suitable-home-learning) exploring the beaks of Galapagos finches (you’ll need to join STEM, it’s free)
  + Marine Metre Squared has many resources you can use at home <https://www.mm2.net.nz/files/dmfile/mm2lockdownactivities.pdf>
  + [Video and text](https://www.acs.org/content/acs/en/education/resources/highschool/chemmatters/videos.html) about the process of digestion (episode 9)
  + [Video](https://www.nsf.gov/news/mmg/mmg_disp.jsp?med_id=188015&from=) of scientists studying adaptive radiation in Caribbean lizards

Chemistry

* + STEM Online NZ has free teaching resources for L1 Sci 90944 & 90932 & the L2 Chem stds 91164 & 91165. [https://www.stemonline.auckland.ac.nz/](https://www.stemonline.auckland.ac.nz/?fbclid=IwAR1Tlt-XTj0vNqG34LcaOWnIHJibn7H_qLuDaRHchnXnW68XmQ71BS9L0QA)
  + A series of videos on basic chemistry concepts with an online text and interactive labs <https://www.learner.org/series/chemistry-challenges-and-solutions/>
  + Give students 3 minutes to find a solid and a liquid and bring it back to hold in front of their screens to show everyone.
  + [Video and text](https://www.acs.org/content/acs/en/education/resources/highschool/chemmatters/videos.html) on how chemistry can be used to see if paintings are real (episode 6), understanding nutrition labels (ep 11), purifying wastewater (ep 5).
  + [Density Challenge](https://sciencespot.net/Media/DensityChallenge_Shared.pptx) using a free online simulation & a density column experiment demo
  + Use[**Hot Chocolate Science**](https://sciencespot.net/Media/ChemUnit1_HotChocolateScience2021.pptx) to review phase changes and physical/chemical changes with links to classification of matter (elements, mixtures, and compounds)
  + Meet the elements [video](https://www.youtube.com/watch?v=Uy0m7jnyv6U) and [worksheet](https://sciencespot.net/Media/MeetElements_Digital_Shared.pptx)
  + [ChemBalancer](http://www.dun.org/sulan/software/trial/chem1/default.htm)is an interactive game to teach students about balancing equations.
  + Investigate making ice-cream <https://www.youtube.com/watch?v=i_IMvzu9BD0>

Earth & Space Science

* Julian Thomson’s geology videos <https://www.youtube.com/results?search_query=julian+thomson+geology+videos>
* Earth Learning Idea videos <https://www.earthlearningidea.com/home/Videos_general.html>
* Earth Learning Idea’s virtual rock kit <https://www.earthlearningidea.com/virtual_rock_kit/index.html>
* What’s on Our Plates – a series of learning modules about our tectonic plate boundary <https://storymaps.arcgis.com/collections/57304587c30947da9e7eff2d3519e80c>
* Space Dave (Dave Owen, Te Awamutu) videos about key concepts for NZ-based astronomy [here](https://www.spacecentre.nz/education/distance-learning/) and [here](https://www.youtube.com/c/TeAwamutuSpaceCentre)
* Get students to break an Oreo biscuit in half and shape the filling to model the phases of the moon against the base (like <https://www.pinterest.nz/pin/192036371584604130/>)
* Video of the [1st moon landing](https://www.sciencekids.co.nz/videos/space/moonlanding.html) & [Neil Armstrong](https://www.youtube.com/watch?v=S9HdPi9Ikhk) & [Buzz Aldrin](https://www.youtube.com/watch?v=qzYfwHr_62g) walking on the moon
* [Activity](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Astro_p034/astronomy/how-does-light-intensity-change-with-distance) using a sensor app to understand how light intensity changes with distance

Physics

* + PhET simulations <https://phet.colorado.edu/en/simulations/filter?type=html,prototype&a11yFeatures=interactive-description>
  + STEM Online NZ has free teaching resources for L1 Sci 90940 & the L2 Physics stds 91171 & 91172 as well as 91524 at L3. [https://www.stemonline.auckland.ac.nz/](https://www.stemonline.auckland.ac.nz/?fbclid=IwAR1Tlt-XTj0vNqG34LcaOWnIHJibn7H_qLuDaRHchnXnW68XmQ71BS9L0QA)
  + Balloon rocket <https://www.iop.org/explore-physics/at-home/episode-7-rocket-balloon>
  + Stacked ball drop <https://www.iop.org/explore-physics/at-home/episode-13-bouncing-high>
  + reversing arrow <https://www.iop.org/explore-physics/at-home/episode-4-reversing-arrow>
  + Matthew Mac’s short lessons for L2 and L3 physics. Videos [here](http://www.kiwiphysics.co.nz/) & a [blog post](https://kiwiphysics.wordpress.com/2022/06/28/ncea-video-lessons/) to explain
  + Video explaining how microwaves work <https://vimeo.com/19215455?embedded=true&source=video_title&owner=1482339>
  + Wearing a sensor to detect body heat <https://www.nsf.gov/news/mmg/mmg_disp.jsp?med_id=187837&from=>
  + How do Newton’s Laws of motion work in space? [Video 1](https://storytimefromspace.com/free-fall/) and [video 2](https://storytimefromspace.com/orbit/)

Primary & Intermediate

* Twinkl is free to join. Most resources have a cost but there are free ones too (as here):
  + Four weeks of home learning for years 7 & 8 <https://www.twinkl.co.nz/blog/top-march-resources-for-teachers-of-year-7-8>
  + KS1 video lessons [floating and sinking](https://www.twinkl.co.nz/resource/ks1-science-investigating-things-that-float-and-things-that-sink-t-sc-2550650) , [plant parts](https://www.twinkl.co.nz/resource/ks1-ages-5-7-science-parts-of-a-plant-video-lesson-t-sc-2550853), [explosions](https://www.twinkl.co.nz/resource/ks1-ages-5-7-activity-video-fun-explosive-science-t-sc-1657810572), [bug hotels](https://www.twinkl.co.nz/resource/ks1-ages-5-7-activity-video-bug-hotel-t-sc-1647336913), [carnivores & herbivores](https://www.twinkl.co.nz/resource/ks1-science-identifying-carnivores-herbivores-and-omnivores-video-t-sc-2550666), [friction](https://www.twinkl.co.nz/resource/ks1-science-lesson-learning-about-friction-as-a-force-video-t-sc-2550686), [solar system](https://www.twinkl.co.nz/resource/ks1-science-learning-about-the-planets-in-our-solar-system-t-sc-2550732), [electrical safety](https://www.twinkl.co.nz/resource/ks1-ages-5-7-science-electrical-safety-video-lesson-t-sc-2550836), [state changes](https://www.twinkl.co.nz/resource/ks1-ages-5-7-science-changing-states-video-lesson-t-sc-1644417015).
  + [Mask experiment](https://www.twinkl.co.nz/resource/mask-up-science-experiment-and-discussion-cards-nz-pe-1643147812)
* A simple activity for students to identify clouds<https://www.facebook.com/tokirimaschool/posts/1008605829756766>
* Science in a Van video clips for lockdown – 28 practical activities that encourage investigative thinking <https://www.youtube.com/c/ScienceinavanCoNzroadshow>
* Open Sci Ed has teaching materials for American grades 6-8, including activities, slides, videos. Online potential <https://www.openscied.org/about-instructional-materials-2/>
* ISS astronaut Shannon Walker reading a book about a **kid in space** <https://storytimefromspace.com/give-me-some-space/>

Science

* Science Learning Hub resources for exploring physics, astronomy and Nature of Science through Galileo <https://www.sciencelearn.org.nz/collections/shared/b473486374619d0da16261eb3cdb9f76>
* UK science technicians’ videos of practicals <https://www.youtube.com/user/andycapo123>
* Virtual Science Teachers is a store of online lessons, some of which incorporate PhET animations. Free to join. <https://www.virtualscienceteachers.com/>
* Teacher suggestions for a fair test Yr 9 students could do easily and safely at home on their own, to collect data which could be used to make a line graph.
  + Investigate drop height relationship to bounce height - only need a ball and measuring tape/ruler
  + Bouncing same ball different surfaces, bouncing different balls same surface. There’s also a nice ARB on this idea pitched well at NOS curriculum L3-4. Tying ball bounce into suitability for a football game.
  + Give students a set of data to figure out what isn’t ‘fair’. [extrapolate to outliers and reliable data]
  + use PheT simulations
  + Rate of reaction with diluted vinegar & baking soda. Add detergent & measure bubble height. Compare various different types of vinegar - Balsamic, red/white wine vinegar etc.
  + Rubber band catapults firing little bits of paper. Investigate how changing the pull back of the rubber band catapult (measure stretch) effects the flying distance. Gives nice easy results.
  + Teaspoons of salt or sugar & time to visibly dissolve. Could vary temp of water if had thermometer.
  + Exercise & pulse is good, no equipment needed. Breathing or heart rate vs the length of time doing star jumps or plank.
  + Ball/toy car on a ramp. Height of ramp vs distance ball/car travels. Would be interesting doing at home cause you'd have so many different ways - i.e. ramp could vary from a book to a slide. With year 9s I would get them to video or photograph their set ups to give others some inspiration
  + Effect of changing the length of a rotor-blade or stem on a paper helicopter. Paper helicopters [https://www.exploratorium.edu/science.../roto-copter.html](https://www.exploratorium.edu/science_explorer/roto-copter.html?fbclid=IwAR0yksZGQhY0r3GyfcTL3-tzwKGv9sfebiqUL2pf6gHZ7ooDEYdYpXgPLEc) it worked well for my y9s last year.
  + Corn flour (mass) and water (volume) - how much do you need of each to make a good consistency for solid or liquid…easy to do at home and good for states of matter and measuring skills.
  + Salinity of water vs buoyancy. Start with 1L of water, carefully float a small bowl in the water and mark its waterline, record. Add a tablespoon of water each time into the bowl and repeat measuring.
  + Pendulum on a string. Time oscillations with different length string, different weights. Research why Big Ben’s time needs to be corrected every so often.
  + Drop cupcake cases & time their fall - different heights, different number of cases etc.
  + making butter - change the amount of salt to cream ratio to see which one changes to butter the fastest - lots of further learning around control, catalysts etc.
  + Use the story of Goldilocks and porridge cooling. It's something they could do at home (measuring time until cool enough to eat)
  + Measuring mass of Gummy bears in different salt solutions (with dilution instructions).
  + Use phone apps?