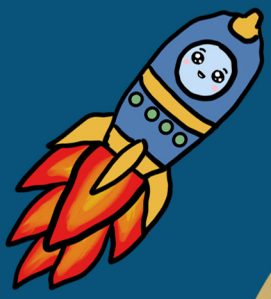
MIDLANDS Science

SCIENCE AT HOME

With Dr. Dan Nickström

Video Series



SCHEDULE FOR TWO SCIENCE-FOCUSED CROKE PARK HOURS

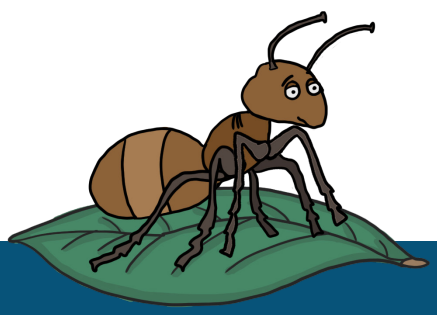
By Dr. Aisling Twohill

SESSION ONE

OVERVIEW: 2 MINUTES

Science at Home is a series of 12 videos of everyday applications of science. In the videos, the scientist, Dan, explores how every day objects work by taking them apart, and explaining what each component does. Each video covers a number of areas of the science curriculum, along with touching on many strand units of other curricular areas, such as geography and mathematics. The videos are holistic in nature and topics are interwoven to best capture the nature of real life, ie that aspects of science don't stand apart from each other in their real life applications. Most of the time they are interlinked and interdependent. The Science at Home video topics are listed on pages 5 and 6 of this document. Many of the videos overlap in small ways, and could be used well together as a series across a school year, as children would consolidate their understanding by seeing a concept they encountered in one video applied in a different context in a second video.

WATCH VIDEO: 10 MINUTES



SCIENCE CURRICULUM SKILLS: 15 MINUTES

Considering the key skills of the science curriculum:

Working Scientifically:

- Questioning;
- Observing;
- Predicting;
- Investigating and experimenting;
- Estimating and measuring;
- Analysing (sorting and classifying; recognising patterns & interpreting);
- Recording and communicating.

Designing and Making:

- Exploring;
- Planning;
- Making;
- Evaluating.

DISCUSS IN GROUPS

- Which of these skills will the children see Dan using when they are watching the video?
- Which skills will the children use when watching the video?
- How could you facilitate them in applying these skills after watching the video?

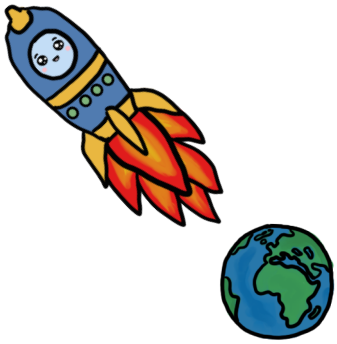
WAYS TO INTEGRATE VIDEO INTO LESSONS AND UNITS OF WORK: 15 MINUTES

Many of Dan's videos could act as stimuli for weeks of scientific exploration. Some approaches that you might find useful are presented here. We have aimed to allow as much flexibility as possible in these suggestions, and we aim to support teachers in structuring inclusive lessons that are easily differentiated:

- Play the video with no introduction. After the video, ask children in groups to make a list of what they discovered from the video and what questions they have. Was there anything that they didn't fully understand? Can they explore this in another way, e.g. through encyclopaedia or science reference books?
- Play the video after lessons on, for example, magnetism. The children will see real life applications of what they have been looking at in their classroom. Encourage the children to again identify questions they have and ideas they would like further information on, and to plan how they will find this.
- Play the video during a lesson where the content is discussed in detail. During a follow-up lesson, ask the children to write-up what they learned. Write-ups could include:
  - prepare a science poster
  - write a review of the video
  - prepare an advertisement for the video
  - explain the video to another person
  - write an interview for Dan,
  - write a bio about Dan, the scientist
- Play the videos in a series with exploration lessons or write-up lessons in between. Children choose a science topic, and make their own "science at home" or "science at school" video.

DISCUSS IN GROUPS

Discuss in groups which approach you would find useful, or identify other ways in which you have used videos to stimulate children's interest.



INTEGRATING SCIENCE WITH OTHER SUBJECTS: 15 MINUTES

We have identified some opportunities for integration on the lesson notes for the videos. We have not identified links with the language curriculum (English or Gaeilge) as they will depend on how the videos are used. The following are some of the parts of the Primary Language Curriculum that Science at Home can contribute to:

Element 3: the development of children's ability to explore and use language for a wide range of purposes, in a variety of genres, and with a range of audiences, familiar and unfamiliar.

- Present narratives and factual accounts of increasing complexity and abstraction.
- Critically select and use a wide-ranging, complex oral vocabulary, phrases and figurative language for familiar, abstract and subject-specific concepts and topics, as appropriate to audience and purpose.
- Demonstrate understanding by listening actively to, analysing, comparing and evaluating conversations and texts in a range of genres and across other languages where appropriate.
- Select how and when appropriate to ask and answer a wide range of question types; open, closed, leading and rhetorical, for an increasing range of complex purposes.
- Analyse and select information to communicate ideas and opinions for a variety of purposes, such as informing, debating, explaining, justifying and persuading
- Describe, predict, reflect upon and evaluate actions, events, processes, feelings and experiences relating to a wide range of real and imaginary contexts.

DISCUSS IN GROUPS

- How the Science at Home videos could be used as a stimulus for parts of the Primary Language Curriculum;
- How the Science at Home videos could be used as part of a cross-curricular approach to teaching, for example the themes of radio, electricity, household appliances, jobs in our community, design and how things work; our local environment.

CONTENT FROM BEYOND THE CURRICULUM

Some of the content of the Science at Home videos is not identified within the current primary school curriculum for science. Could these videos be used to stretch children's awareness of science around them? Could they be used as further challenge for high-at-taining classes? Could they be used for recount writing, or exploring communication in a dedicated language register?

SESSION TWO

During session 2, all parts of this first session should be reviewed and time taken to plan a unit of work that includes the Science at Home videos. As highlighted above, this unit of work could be one lesson, two lessons, or a month of work depending upon how you choose to use the videos.

TOPICS

EPISODE OVERVIEW

More detailed lesson notes are available on request. Keep an eye on Midlands Science's website www.midlandsscience.ie and social media for upcoming events, activities and workshops.

EPISODE	THEME	STRANDS	STRAND UNITS	INTEGRATION IDEAS & LINKS
#1 HOW A SPEAKER WORKS! **#3 HOW A MICRO-PHONE WORKS!**	**Key Theme:** Sound **Secondary Theme:** Magnetism; what is physics?; working with physics; being a scientist, electric-ity	· Energy and Forces · Environmental awareness and care	· Sound, Magne-tism, Electricity · Science and the Environment	Music & Composing
#2 HOW A FRIDGE WORKS!	**Key Theme:** Heat **Secondary Theme:** Materials and change, being a scientist	· Energy and Forces · Materials · Environmental awareness and care	· Heat, Electricity · Materials and Change · Science and the environment	
#4 HOW A RADIO WORKS!	**Key Theme:** Light **Secondary Theme:** Sound, being a sci-entist, electricity	· Energy and Forces · Environmental awareness and care	· Light, Sound, Forces, Electricity · Science and the environment	History of the Radio
#5 IS THERE NUCLEAR RADIATION IN YOUR HOME?	**Key Theme:** Matter and atoms **Secondary Theme:** Being a scientist, electricity	· Energy and Forces · Environmental awareness and care	· Magnets, · Electricity · Science and the environment	· Atoms · Nuclear power and nuclear radiation · History · Geography
#6 WHERE DO TREES COME FROM?	**Key Theme:** How trees grow	· Environmental awareness and care · Living Things	· Environmental awareness · Science and the environment · Plant and ani-mal Life	Chemical composition of e.g. water
#7 BIODIVERSITY	**Key Theme:** Biodiversity, impact of man on the environment	Environmental awareness and care	· Environmental awareness · Science and the Environment	· Geography · History

EPISODE	THEME	STRANDS	STRAND UNITS	INTEGRATION IDEAS & LINKS
#8 HOW DOES ELECTRICITY WORK?	**Key Theme:** Electricity **Secondary Theme:** Being a scientist	• Energy and Forces • Environmental awareness and care	• Electricity • Science and the environment	• Geography • History
#9 HOW DOES GRAVITY WORK?	**Key Theme:** Gravity **Secondary Theme:** Being a scientist, electricity	• Energy and Forces • Environmental awareness and care	• Forces • Science and the environment	• Geography • History • Space time and interplanetary gravity
#10 HOW DO MOTORS SPIN?	**Key Theme:** Motors (electricity) **Secondary Theme:** Magnets, being a scientist	• Energy and Forces • Environmental awareness and care	• Magnets, Electricity • Science and the environment	• Atoms • Connections between electricity and magnets
#11 VISUALISING SOUND AND MUSIC	**Key Theme:** Sound and Music **Secondary Theme:** Being a scientist, electricity	Energy and Forces	Sound	• Music • Mood
#12 QUESTIONS AND ANSWERS	**Key Theme:** Miscellaneous – questions from children **Secondary Theme:** Being a scientist	• Materials • Energy and Forces • Environmental awareness and care	• Properties and characteristics of materials • Forces, Electricity • Science and the environment	Black holes in space

CREDITS

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CONTACT

Please contact **jgorman@midlandsscience.ie** or **aisling.twohill@dcu.ie** if you would like advice or support in facilitating Science at Home Croke Park hours.

Good luck, and thank you for choosing Science at Home!


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