
TEACHERS NOTES

The overall aim of this transition project is to:

- be child-centred, engaging pupils in the transition process, meeting the needs of individuals and enabling them to develop fully;
- create, maintain and develop systems and structures that support links, partnerships and sustained collaboration between schools;
- support collaboration between teachers from primary and secondary schools to share best practice and expertise;
- build relationships between primary and secondary teachers based on a common vision, co-operation, shared responsibility and trust;
- support pupils to develop the confidence, understanding and skills they need to become increasingly independent learners in the STEM subjects as they move from year 6 to year 7;
- ensure progression within working scientifically;
- share and use assessment data and other information to plan progression as pupils move from primary school to secondary or post-primary school.

Planning your Polar Explorer primary-secondary transition project

Overview of timeline and processes

Spring
term

- Initial planning meeting with Primary science co-ordinator and secondary lower school science co-ordinator to discuss project
- Draw up provision programme for the transition day
- Agree the PEP investigation pupils will carry out when they visit the secondary school

Post
SATs

- Primary pupils are introduced to PEP theme, carry out initial background research, use key words and scientific terminology and put together a presentation for secondary teachers
- Risk assessment and permission forms completed
- Secondary teachers plan investigation, order equipment and make lunch time arrangements

Post
GCSEs

- Primary pupils introduce the secondary teachers plus any Post 16 student helpers to the PEP theme by presenting their initial background research
- Primary pupils carry out an investigation led by the secondary teachers. Pupils collect and record data, including photographs to take back to their own school

Following
practical
investigation

- Primary pupils write up their investigation
- Make a scientific poster to add to the initial background information display / presentation
- Complete an individual PEP reflective diary (based on the Crest Awards Discovery Passport)
- Invite the secondary teachers (and parents?) to a presentation of the completed project at their school

End of
summer
term

- Primary pupils presentation to secondary teachers
- Completed PEP reflective diary handed over to secondary teachers

Autumn
term - Y6
open day

- New secondary pupils present their project to prospective pupils and their parents at the open evening for local primary schools

Planning your Polar Explorer primary-secondary transition project

A successful STEM transition project is one which allows pupils to both use and develop a range of STEM skills that they will ultimately need to become independent learners in the STEM subjects. Teacher Resource 1 contains a list of STEM Skills that a 'secondary ready' pupil should display and Teacher Resource 2 shows progression in scientific enquiry from 5 to 14 year olds.

This project has several different parts involving both primary and secondary staff which should take place over a number of lessons. Carefully planning and good communication between the primary and secondary staff will be the key to running a successful project.

Curriculum Links

The National Curriculum framework for England

The nature, processes and methods of science –

- Researching using secondary sources
- Spoken language

Working Scientifically

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments

Science in Curriculum for excellence Scotland

The sciences framework provides a range of different contexts for learning which draw on important aspects of everyday life and work.

Learning in the sciences will enable me to:

- develop curiosity and understanding of the environment and my place in the living, material and physical world
- demonstrate a secure knowledge and understanding of the big ideas and concepts of the sciences
- develop skills for learning, life and work
- develop the skills of scientific inquiry and investigation using practical techniques
- develop skills in the accurate use of scientific language, formulae and equations
- apply safety measures and take necessary actions to control risk and hazards
- recognise the impact the sciences make on my life, the lives of others, the environment and on society
- recognise the role of creativity and inventiveness in the development of the sciences
- develop an understanding of the Earth's resources and the need for responsible use of them
- express opinions and make decisions on social, moral, ethical, economic and environmental issues based upon sound understanding
- develop as a scientifically-literate citizen with a lifelong interest in the sciences
- establish the foundation for more advanced learning and future careers in the sciences and the technologies.

Science content

The science content links can be found in the teachers' notes of the individual scientific investigations / activities.

Part 1 – Setting the scene at your Primary School

Pupils are introduced to the new Polar Research Vessel RRS Sir David Attenborough and the life in Antarctica via an introductory PowerPoint Slide Show and short video clip. If the pupils have already been doing some work on PEP and are already familiar with the RRS Sir David Attenborough Research vessel, then you could go directly to the research activity.

Working in groups pupils carry out their own further research into Antarctica. The research findings are then put together as a poster, display or PowerPoint presentation, which will be presented at the start of the secondary school visit.

Depending on the ability of your pupils you may wish each group to produce a presentation of their own or you may wish to produce a class presentation with a contribution from each group.

Time 30 minutes introduction, 60 minutes researching, Presentation – time will vary depending on how you choose to do this.

Resources provided

-  Introducing RRS Sir David Attenborough PowerPoint Slide Show
-  Video Clips <https://www.bas.ac.uk/polar-operations/sites-and-facilities/facility/rrs-sir-david-attenborough/>
-  Student worksheet 1 - Research Antarctica

Resources required

-  Poster paper
-  Coloured pens/pencils
-  Scissors
-  Glue
-  Computer and Internet access (check that you have access to the listed websites)

Part 2 – Visiting the secondary school to investigate further

Start the day by asking one or two groups to present their research finding to the secondary school teachers and any post-16 helpers. This will help to build pupil confidence as well as update secondary teachers as to how the project is going so far.

Working in groups the 10-11 year old pupils will plan and carry out the investigation agreed at the initial planning meeting. Whilst planning the investigation pupils should consider dependent, independent and control variables. They should then carry out a fair test to collect and record a range of data that can be taken back to their primary schools for analysis and evaluation.

Suitable investigations

Within the Polar Explorer Programme Teaching Notes book there are a number of suitable investigations that could be used to collect data during the secondary school visit. However, secondary teachers may want to slightly modify some of these activities to for example introduce more specialist equipment such as measuring cylinders, beakers, temperature / pH sensors or digital balances and encourage the pupils to collect more data points over a greater range.

Design a boat <https://www.stem.org.uk/resources/elibrary/resource/417578/design-boat>

Ice Breaker <https://www.stem.org.uk/resources/elibrary/resource/417182/ice-breaker>

Loading cargo <https://www.stem.org.uk/resources/elibrary/resource/417579/loading-cargo>

Do you like your oceans sparkling or still?

<https://www.stem.org.uk/resources/elibrary/resource/417581/do-you-your-oceans-still-or-sparkling>

How do humans and animals keep warm in the arctic?

<https://www.stem.org.uk/resources/elibrary/resource/417590/how-do-humans-and-animals-keep-warm-arctic>

Salty seas <https://www.stem.org.uk/resources/elibrary/resource/417184/salty-seas>

Unloading the vessel – pulleys, levers, electromagnet investigation

Within the Polar Explorer Programme Teaching Notes book there are a number of suitable investigations that could be used to collect data during the secondary school visit. Alternatively, secondary teachers might want to use one of their own investigations linked to a Polar Explorer Programme theme. For example, 'Unloading the vessel'. Here we could investigate pulleys, levers or electromagnets. (Activities not included).

Additional resources provided



Student worksheet 2 - Investigation planning sheet

Part 3 – Analysis and evaluation of your experimental data

Preparing a scientific poster

Each group of students will present their investigation in the form of a scientific poster using one of the template outlines provided. The posters should be made on large pieces of sugar paper. They can be either handwritten or individual sections typed, printed and stuck onto the poster.

Most of the students will not know the difference between a teaching poster and a scientific poster. So introduce this part of the project by explaining the difference. The PowerPoint presentation contains a couple of examples to highlight the difference. A teaching poster is usually very colourless, has lots of images on it and lots of information. The material is not structured in any particular way.

A research poster is carefully structured with clearly labelled sections. The material is presented in a logical way and should provide enough detail so that the reader could repeat the investigation.

Finally, on completion of their posters, students will complete their reflective diaries which will then be passed onto the secondary teachers.

Resources provided



Presentation PowerPoint – A Scientific Poster



Scientific Poster Template 1



Scientific Poster Template 2



Polar Explorer Project reflective diary

Resources required

- | | |
|---|---|
|  Large poster paper |  Coloured pens/pencils |
|  Scissors |  Glue |
|  Graph paper |  Ruler |
|  Computer and Internet access | |

Part 4 – Celebrate success by running a Polar Explorer Transition Project Celebration Event

Prior to the celebration event, 10-11 year old pupils will send out some invitations to attend the Polar Explorer Scientific Event. Invitations should be sent to:

- The secondary teachers and any post-16 students involved in the practical investigation day
- Primary School Senior Leaders
- 9-10 year old class and teacher

This could be via a written personal invitation, email or general flyer. Pupils can design their own invitation or complete the template provided.

Resources provided

-  Polar Explorer Project Celebration event invitation template
-  Certificate of Participation

Running the Polar Explorer Transition Project Celebration

The scientific posters should be displayed around the classroom or in an open area of the school such as the hall. If possible, display also the initial research. Each group of pupils should stand by their poster and be ready to explain the investigation they have written about. They should also be prepared to answer some questions.

As the guests arrive they should be invited into the room and asked to take a seat. After welcoming the guests ask a group of pupils to set the scene by presenting their initial research into the new Polar Research Vessel RRS Sir David Attenborough and life in Antarctica. Guests should then have some time to look at the scientific posters and talk to the children before re-assembling for the final project certificates to be handed out.

Optional open evening at the secondary school.

Transfer the finished posters and display to the secondary school and re-run the poster session during the open evening.