

Planning and Developing Enquiry Based Activities

Enquiry based activities should present pupils with an interesting challenge and provide them with opportunities to develop their problem solving skills and encourage deep learning. Activity content should enable pupils to make meaningful learning connections across subjects. Activities should encourage pupils to explore multiple sources of information and to evaluate a range of perspectives and values. They should make use of active learning methods facilitate diverse approaches to problem solving and offer competing solutions.

(See CCEA Key Stage 3 resource Active Learning and Teaching Methods)

Prior Learning

The CERN video resources assume that pupils will have some knowledge and understanding of the following:

- types of forces;
- effects of a force;
- energy and energy transfer;
- the basic structure of the atom and its constituent parts;
- elements and compounds;
- using the periodic table to classify elements; and
- scientific methods.

Infusion of Thinking Skills and Personal Capabilities

When planning and developing your activities you might consider ways to infuse Thinking Skills and Personal Capabilities within Areas of Learning. This will enable pupils to acquire a deeper understanding of skills and concepts.

One of the ways this might be achieved is by applying the Launch, Activity Debrief lesson model. This illustrates how Thinking Skills and Personal Capabilities can be infused into subject activities.

For example, during the launch phase teachers should share learning intentions and success criteria and model skills/capabilities that pupils need to demonstrate. When participating in activities pupils

should be encouraged to use thinking frames and ask effective questions and as part of the debrief pupils should be encouraged to connect learning to other contexts.

Key Questions

When developing activities you might think about some key questions that you could structure your activities around, for example;

CERN

- What is CERN?
- Where is CERN?
- What type of work is CERN involved with?
- How many people are employed at CERN?
- How many different STEM based careers can be found at CERN?
- What type of work does a Scientist or Engineer do at CERN?
- What makes someone want to follow a career in Science or Engineering?
- What skills are required to be a Scientist or Engineer?
- What are the rewards and challenges involved in Scientific Research?

Particle Physics

- What is particle physics?
- What are elementary particles?
- What is the Large Hadron Collider (LHC)?
- What is the LHC used for?
- What happens when protons collide?
- How many different types of elementary particles are there?
- How are elementary particles classified?
- What are Quarks?
- What are Bosons?

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Origins of the Universe

- What does the 'Big Bang Theory' tell us about the origins of the Universe?
- What are black holes?
- What is dark matter?
- What are the other main theories or ideas about the origins of the Universe?
- How can we tell if one theory is likely to provide a more accurate explanation of the origins of the Universe than another?
- Can scientific explanations for the origins of the universe be reconciled with religious beliefs?

The Contribution of CERN to Economy and Society

- Which countries fund CERN?
- How have advances in technology contributed to our knowledge and understanding of particle physics and the origins of the Universe?
- What 'spin off' technologies have emerged from work at CERN?
- How do these technologies benefit society and the economy?
- What are the financial costs of operating CERN?
- Is the work at CERN justified in terms of value for money?
- What are the benefits and challenges of international collaboration between countries at CERN?