

The Science of Flight

PHYSICS Age 11-13



Red Arrows



Red Arrows Royal Air Force

Learning Aims:

- To identify the forces affecting an aeroplane.
- To describe forces using force diagrams.
- To create Virtual Reality experiences based on prior learning.

CONTEXT

A big aim of the Royal Air Force Aerobatic Team is to inspire the next generation - potential future pilots, engineers and technicians. The Red Arrows is one of the world's premier display teams and has provided great footage from inside the cockpit to ClassVR. This offers a fantastic opportunity to bring the science of flight to life. This lesson will require a moderate level of digital literacy and a core understanding of CoSpaces – the ability to create an environment, add objects and code them using block coding or Javascript will be required to get the most from the session.

PRACTICAL SESSION



Red Arrows Video



CoSpaces

This session explores the key forces that are involved in flight, specifically when looking at the Hawk jet used by the Red Arrows. To begin, use the ClassVR portal to play the video and discuss with students how they think the plane is able to stay in the air. This is an assessment opportunity for prior knowledge and a great time to discuss the forces in play on a plane in flight – thrust, drag, lift and weight. After explaining and demonstrating these forces, introduce students to the 3D model of the jet and ask them to identify key features of the vehicle, as well as any specific design aspects which make them aerodynamic and fit for purpose.

Afterwards, introduce the students to the CoSpaces website and instruct them to create and code a working model of a Hawk jet with accurate labels to demonstrate their understanding. Students with a more advanced understanding of coding can create an interactive model that changes based on the forces acting upon it using more advanced variables from either the CoBlocks or Javascript options. Finally, use the CoSpaces app within the ClassVR portal to explore the students' interactive models and collectively debug the code that was used.

IMPACT ON LEARNING

Using a tool like CoSpaces is an incredible way to help embed learning into a students' long-term memory – by experiencing the content directly through Virtual Reality footage and then creating new content to explain key concepts. In doing so, students are using advanced cognitive recall techniques that give a genuine, first-hand memory to draw upon when they need to either remember a specific topic or build upon their knowledge later in the year.

