



## Bloodhound Rocket Experience KS4 duration: 3 hours

Bloodhound LSR is a supersonic car and global engineering adventure aiming to set a new land speed record of over 1000mph and inspire the next generation with science, technology, engineering and maths. A studio show introduces the record and the science behind designing a land speed record breaking car, followed by a workshop in which students design and, using real tools, shape their own rocket-powered model car (in pairs), including attaching axles and wheels. The day concludes with a rocket-powered race – with cars reaching speeds of up to 60mph!

### Key Words:

Engineering. Design. Speed. Acceleration. Thrust. Air resistance. Drag. Friction. Rocket. Jet. Streamlining. Sound barrier.

### Learning objectives

Learn about the science and technology behind the Bloodhound project  
Be inspired, and recognise STEM as helping students to gain work in rewarding careers such as engineering  
Understand the scientific principles that influence and limit high speed travel in a rocket-powered car  
Understand how forces are responsible for speeding up and slowing down a rocket powered car  
Gain an insight into how teams of engineers work collaboratively to solve problems and be innovative  
Apply scientific ideas to design and shape a model rocket car using various workshop tools  
Use real rockets to test their cars over a 25m track with data-logging timer gates to measure speed  
Test their cars and analyse performance using data from the speed trial

### Content: Example Timetable

The exact timings of the day will vary based on scheduled arrival time, but will include:

10:00—Arrival and Welcome  
10:15—Studio Show: Introducing students to the Bloodhound project and the exciting science behind it  
11:00—Workshop: Students craft their very own rocket-powered model car (in pairs\*)  
12:00—Lunch break and time to explore We The Curious  
12:45—Rocket Car Testing: On a 25m guide wire, cars can reach speeds of up to 60mph  
13:15—End of Theme Day activities – with more time to explore We The Curious (venue closes at 5pm)

### Curriculum Links:

#### Science

##### Working Scientifically

Development of scientific thinking. Explain every day and technological applications of science  
Make and record observations and measurements using a range of apparatus and methods  
Scientific vocabulary, quantities, units, symbols and nomenclature

##### Forces

Forces and their interactions  
Speed and velocity, speed as distance over time; acceleration; distance-time and velocity-time graphs  
Recall typical speeds encountered in everyday experience for wind and sound, and for walking, running, cycling and other transportation systems  
Forces, accelerations and Newton's laws of motion: Newton's First Law to explain the motion of objects moving with uniform velocity and also objects where the speed and/or direction change and Newton's Third Law and apply it to examples of equilibrium situations

# we the curious Theme Day



## **Safety in public transport**

Explain the dangers caused by large decelerations and estimate the forces involved in typical situations on a public road

Uses of mathematics:

Formulae relating distance, time and speed, for uniform motion, and for motion with uniform acceleration, and average speed

## **Potential Hazards**

The workshop involves using hand-tools and students will be provided with appropriate instructions for using them safely.

The rocket cars use real rockets and will be launched using strict procedures and guidelines at all times.