

A TO Z OF ENGINEERING

WORKSHOP 1: Rollercoasters



Welcome to Engineer Academy where we're exploring an A to Z of Engineering – everything from acoustics to zoos!



So what does engineering actually mean? Well, anything that is built – whether a bridge, building, washing machine and even your smartphone, must first be engineered.

An engineer is a person who designs and builds complex products, machines, systems or structures. They want to know how and why things work, and have scientific training that they use to make practical things. Engineers often specialise in a specific branch of engineering, such as civil, electrical, mechanical and chemical engineering. You can think of engineers as problem solvers – so if you like solving puzzles you might make a great engineer!

The word engineer, which goes back to the 14th century, when an 'engine'er' meant someone who constructed military engines like catapults. The word 'engine' itself comes from the Latin word 'ingenium' (c. 1250), which means 'innate quality, especially mental power, hence a clever invention.'

You'll find engineers in almost every corner of the world, working on projects from the tiniest nanotechnology to the largest rockets. Engineers work on everything from cell membranes to construction and prosthetics to improving transport and developing renewable energy resources... and just about everything in between!



Royal Academy
of Engineering

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Find out more at www.funkidslive.com/engineer

Engineering through the Ages

From the Parthenon to the Eiffel Tower and from light bulbs to the internet, engineering has been a part of human history, in one form or another, for thousands of years!

Today's engineers use the most advanced technologies, alongside established scientific principles, to apply cutting-edge solutions and innovation to real world challenges.

So – what's FUN about Engineering? Engineering isn't just about buildings and circuits – it's behind some of our favourite everyday objects and activities, from rollercoaster rides to sport, gaming and even dancing... Let's find out more!

R is for Rollercoasters

Did you know there are over 200 roller coasters in the UK – the tallest being The Big One at Blackpool Pleasure Beach. And at 64.9 metres, it certainly lives up to its name. It's also one of the fastest roller coasters – with a top speed of 74 mph, that's faster than a car on the motorway!

The rides are full of magic and excitement. And it's all thanks to – yes, you've guessed it, engineers who come up with ideas for new rides, design and build them, and then keep them working safely.

Roller coaster engineering is a type of mechanical engineering. These are experts who are all about mechanical systems – from cars and robots to drones and of course, rollercoasters!

CHOOSE YOUR RIDE!

Original Rollercoasters carried you in a car on a wooden track up, down and around.

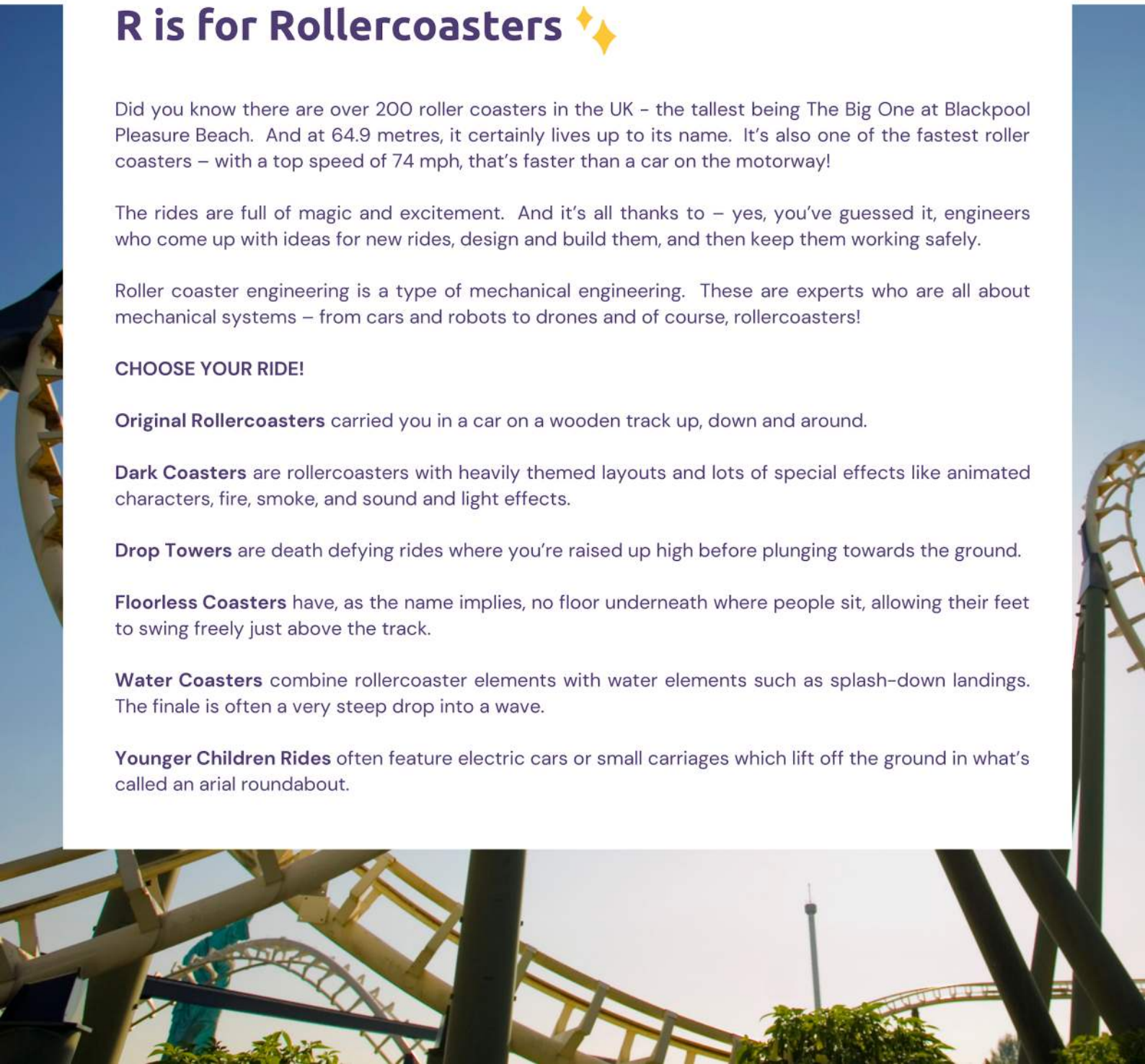
Dark Coasters are rollercoasters with heavily themed layouts and lots of special effects like animated characters, fire, smoke, and sound and light effects.

Drop Towers are death defying rides where you're raised up high before plunging towards the ground.

Floorless Coasters have, as the name implies, no floor underneath where people sit, allowing their feet to swing freely just above the track.

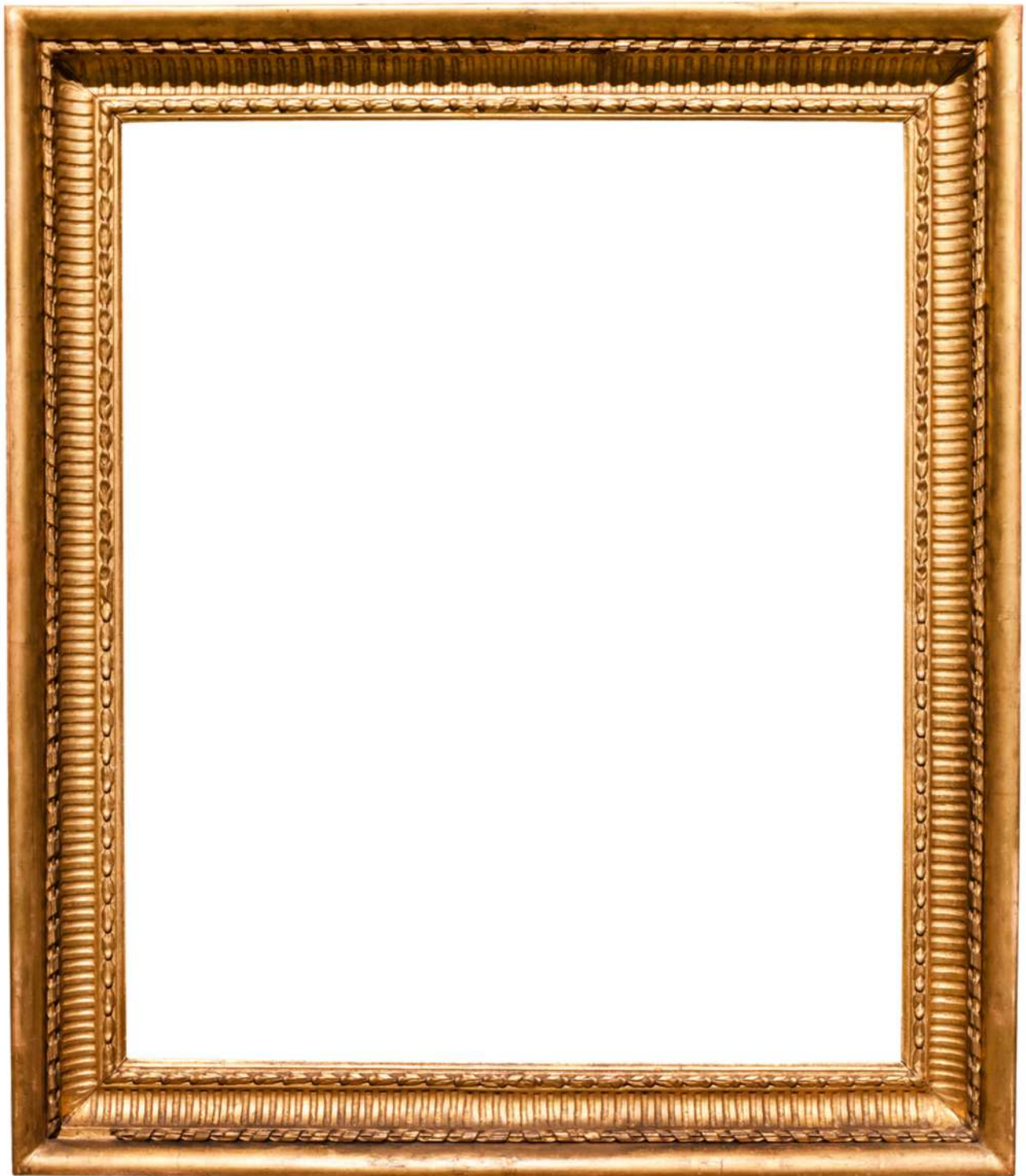
Water Coasters combine rollercoaster elements with water elements such as splash-down landings. The finale is often a very steep drop into a wave.

Younger Children Rides often feature electric cars or small carriages which lift off the ground in what's called an arial roundabout.



Academy Challenge

We've looked at some of the different designs of rollercoasters and had a go at making one ourselves – but what might a rollercoaster look like in the future? Maybe it goes into orbit or spins you around the solar system! Use the space below to draw your ideas – let your imagination go wild!



Wordsearch

F S T U B U L A R N L R G L Q M N E
Z T O L A T H C E N T R I F U G E B
H A Q G B S T R U C T U R E F Q R L
R N H V R S B K T W V C C R R O G J
K C B J B I L W R J N B R A K E S F
U H T H E M E P A R K E C J N V J D
F I G G F F O U N D A T I O N S Y B
Z O R O L L E R C O A S T E R I U O
B N R D S G A P F G R A V I T Y B Y
X K U A M E C H A N I C A L Z M G C
Q C A R S H Y D R A U L I C Q G U N
C H A I N L I N K U H T R A C K S E

Can you find all of these words?

Rollercoaster
Chainlink
Brakes
Gravity
Tubular
Centrifuge
Mechanical

Themepark
Foundations
Structure
Track
Cars
Hydraulic
Stanchion

Did you know that...

There are many different types of rollercoasters including floorless coasters, a type of steel roller coaster where riders sit with no floor underneath them, allowing their feet to swing freely just above the track!