Engage your pupils in the exciting world of mechanical art and design before your visit to **The MAD Museum**. Over the next two pages, we've got lot of ideas to help you bring **physics, design and technology,** and elements of **art** and **design**, to life in your classroom.

BEFORE YOUR VISIT

At The MAD Museum, you'll have many opportunities to see **energy, forces** and **motion** in action. Show your pupils this creative video from the band OK Go. Discuss the simple mechanisms and forces on show: https://www.youtube.com/watch?v=qybUFnY7Y8w

Discuss **kinetic energy** (the energy an object has because of its motion) and how it relates to **kinetic art** (art that moves). Kinetic art moves as a result of **force** – it can be triggered by a human, blown by the wind or powered by a motor, for example.

Look at these different types of kinetic art and explore the **forces** that power them:

- **Chris Burden's Metropolis II** – a motorised toy car sculpture: https://www.youtube.com/watch?v=IlacDdn5yIE
- **A kinetic lego sculpture by JK Brickworks**, which can be motorised or operated with a crank: https://www.youtube.com/watch?v=pKrHTYqm8pw
- **Alexander Calder's Rouge Triomphant** – a wind-powered mobile: https://www.youtube.com/watch?v=uyIgGb8SgrE
- **Anthony Howe's** wind-powered kinetic metal sculptures: https://www.howeart.net

BEFORE YOUR VISIT CONTINUED...

You'll see many more examples of kinetic art at The MAD Museum, but **why not design your own wind-powered kinetic sculptures before you visit**, inspired by the examples above?

Predict the **different types of forces** that might be used in the mechanical art and exhibits at The MAD Museum, including **automata, marble runs** and **rolling ball machines**. After your visit, check whether your predictions were correct.

Understand the role **friction** and **air resistance** play in the rolling ball machines at The MAD Museum.

- This BBC KS3 Bitesize video explains friction well and is an experiment you can also recreate in the classroom: https://www.bbc.co.uk/education/clips/zv9sb9q
- This BBC KS3 Bitesize video demonstrates air resistance using a cyclist: https://www.bbc.co.uk/education/clips/z24pvcw
- Discuss how might air resistance affect a marble.

Using a simple diagram like the one shown on the right, ask your pupils to describe the energy and forces required to make a marble loop the loop.