



Royal Academy  
of Engineering

THIS IS  
ENGINEERING

# ENGINEERING IN THE MOVIES

## THE MAGIC DRUM

STEM

Technology and Engineering Focus



# INTRODUCTION

Originally a vintage toy from the 1830s, a zoetrope (translated from the Greek 'wheel of life') applies the same principles filmmakers have used since the start of cinema.

This principle is the illusion of motion from the rapid succession of static pictures. Every film you have ever watched is made up of individual pictures speeding by in quick succession. A zoetrope is just an early version of that.

A movie is traditionally made from 24 frames of individual images played per second to create the moving picture. This led to animation classics such as **PINOCCHIO**, **THE LION KING** and **CARS**.



Pictorial Press Ltd / Alamy Stock Photo

## CHALLENGE

- Teams of two
- 150 minutes
- KS2/3
- Developing

## MATERIALS

- White and black heavy card
- Low heat glue gun
- Marble / dowel rod
- Pritt stick
- Camera phone
- Printer
- Sticky tape
- Scissors
- Ruler
- Correx sheet
- Straw
- Paper plate

## THE CHALLENGE

- Take at least 12 photos of your classmate, changing their movement slightly in each picture. Print the photos and stick them to the strip template on the next page.
- Alternatively, you can draw a dancing cartoon character in each frame (see **Figure 1**).
- Cut out the strips and stick the ends together to form a ring with the images facing inwards.
- Cut vertical slits into the black heavy card and stick to a circular base (such as a paper plate) using tape or a glue gun to make a cylinder.
- Insert a pencil in the centre of the base and secure with the glue gun.
- Insert your animation strip and spin the handle to see your drawings come to life (see **Figure 2**).

## EXTENSION

Use wood and plastics to build a longer lasting more durable zoetrope. Add a motor to generate the spin.

## YOUTUBE GUIDE

[www.bbc.co.uk/cbbc/thingstodo/art-ninja-zoetrope-make?collection=art-ninja-makes](http://www.bbc.co.uk/cbbc/thingstodo/art-ninja-zoetrope-make?collection=art-ninja-makes)

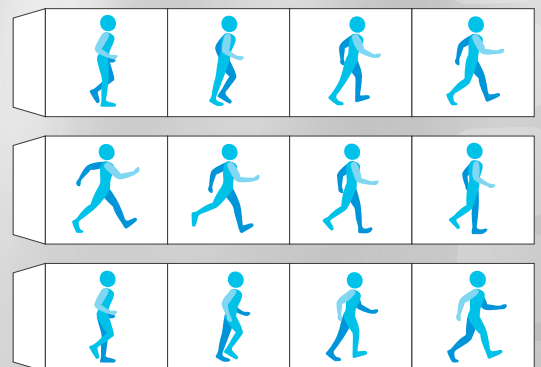


Figure 1

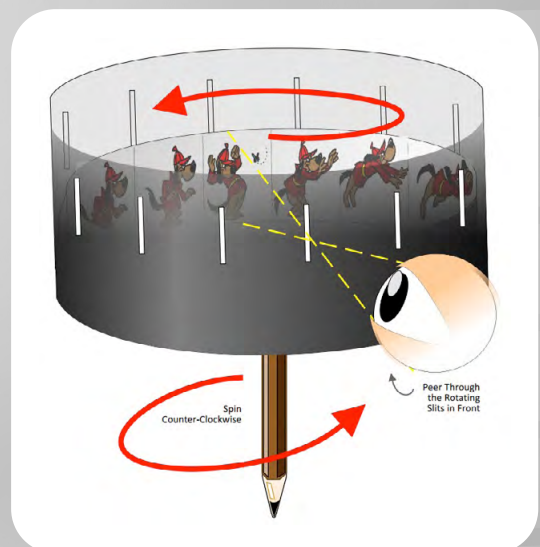
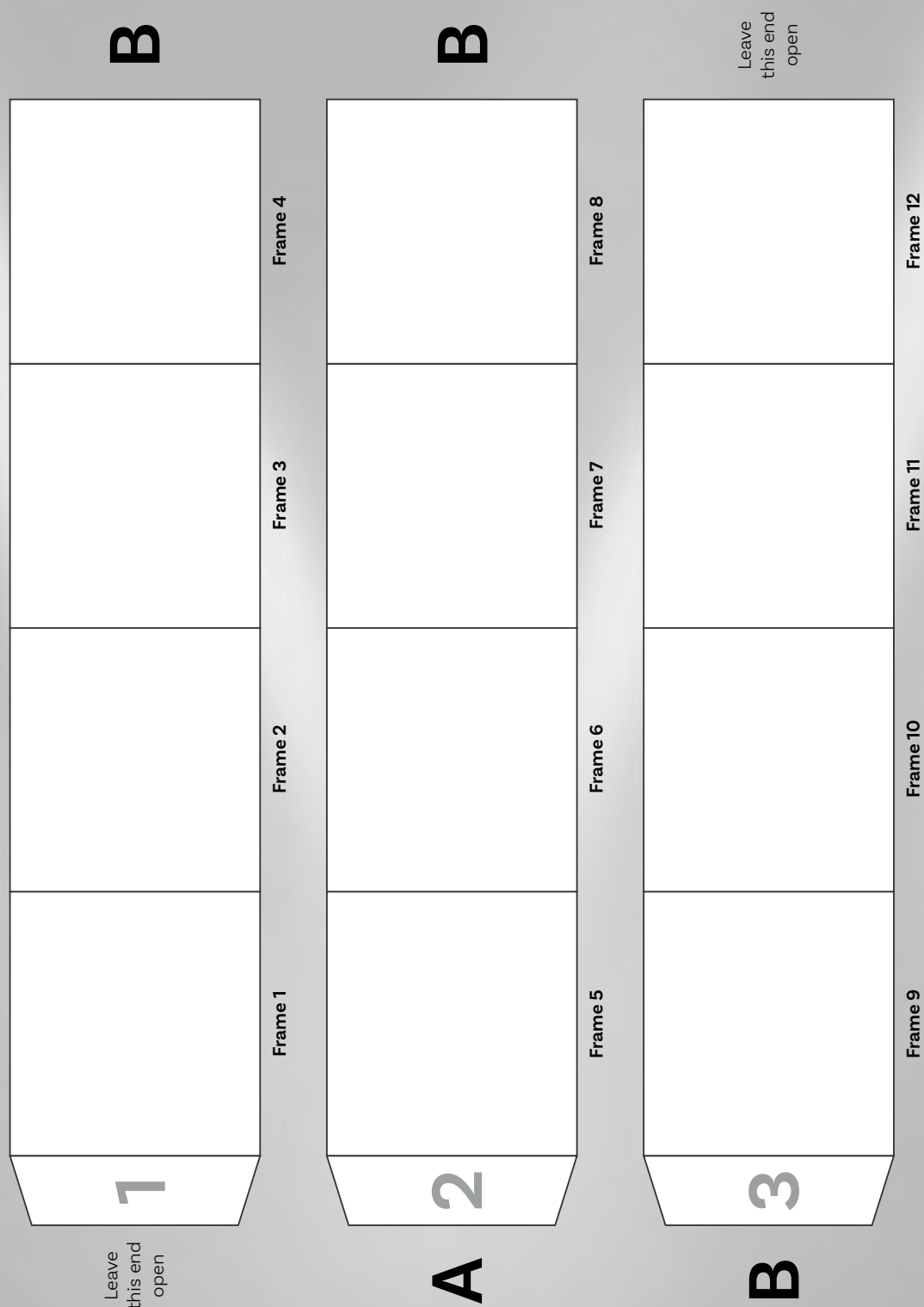


Figure 2

# ZOETROPE STRIP TEMPLATE



**Animation Strips:** Draw or print your animated still images onto this template. 12 images are needed. Cut out the three strip sections and connect ends together (B to A), leaving the beginning end disconnected from the last end (They are easier to store and insert into the Zoetrope when left one long strip, instead of a connected circle).



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In collaboration with our Fellows and partners, we're growing talent and developing skills for the future, driving innovation and building global partnerships, and influencing policy and engaging the public.

Together we're working to tackle the greatest challenges of our age.

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We're growing talent by training, supporting, mentoring and funding the most talented and creative researchers, innovators and leaders from across the engineering profession.

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