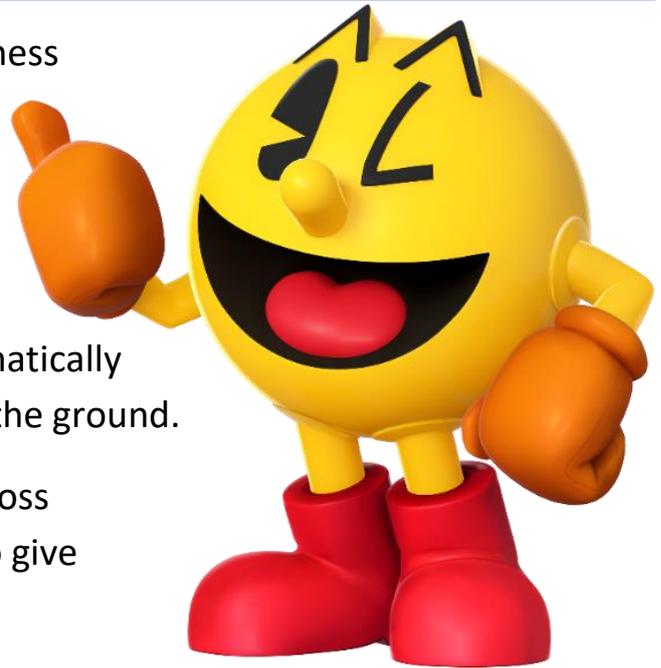# EPro8 Challenge
Engineer Problem Solve Innovate

Pac-Man

Invented in 1980, Pac-Man has the Guinness World Record for the most coin-operated Arcade machines world wide: 293,828.

You will be constructing a real-life Pac-Man, complete with jaws that automatically open and shut as Pac-Man moves along the ground.

A laser will detect as Pac-Man passes across Pac Dots (mirrors). These are counted to give you a score.

⚡ This challenge contains optional activities using the EPro8 Electronics Starter Kit.

Pac-Man Circle	
Criteria	Use an axle and an aluminium rod to construct a compass that can draw giant circles. Draw a circle with a diameter of 700mm. Cut the jaw from the Pac-Man circle. Keep the cut out part (you will need it for later).
Hint	Hold the axle in the centre of the circle and rotate the rod to draw a circle. Make a pen holder at the other of the rod. If a circle has a diameter of 700mm, what is the radius?

Pac-Man Mounting

Criteria	Construct a vehicle approximately 700mm long and 400mm wide. Mount the Pac-Man vertically on the vehicle.

Hinged Jaw

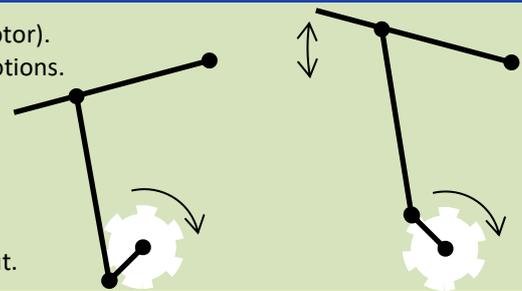| Criteria	The jaw (from the offcut) is hinged using an axle so that Pac-Man's mouth can open and shut.

Crank Handle Jaw

Criteria	Turning a crank handle continuously in one direction causes the jaws to open and shut
Hint	The crank handle provides a rotating motion (like a motor). Machines convert this motion into a range of other motions. A simple example is a car's window wiper. The motor moves the wiper from side-to-side as shown in this diagram. If the jaw is connected to this then it will open and shut.

Motorised Jaw

Criteria	A push button controls a motor, which opens and shuts the jaw.

Push Operation

Criteria	Pushing Pac-Man along the ground causes the jaws to open and shut.
Hint	Convert your previous contraption so that jaws are connected to a wheel rather than the crank handle

Motorised Operation (Simulator)	
Criteria	Use the online electronics simulator, code **PCMN.** One motor controls Pac-Man moving forward or backwards. A second motor makes the jaws open and shut.

Pac-Dot Detection and Scoring	
Criteria	Five mirrors (the Pac-Dots) are placed on the ground. A counter counts up every time Pac-Man drives over a Pac-Dot.
Hint	Set up the laser so that it will reflect on the mirror and be picked up by the laser sensor.

After you have attempted this challenge watch the tutorial to see our solution at
www.EPro8Challenge.co.nz/Tutorial and enter the Challenge Code **PCMN**.

Team_Z