EPro8 Challenge
Engineer   Problem Solve   Innovate

Fishing Rod

Everyone likes a good feed of fish and chips.

But it is kind of boring sitting and waiting for a fish to get caught on your line.

Build a fishing rod that can lower the hook into the ocean, can wind in extra fast, can detect when a fish is caught, and can automatically wind the fish in.

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

Fishing Rod Construction	
Criteria	A fishing rod is at least 1.3m long. The hook is represented by a pulley tied to the end of the rope. The rope feeds through a pulley at the top of the rod. A crank handle winds the rope on to a reel at the base of the rod.

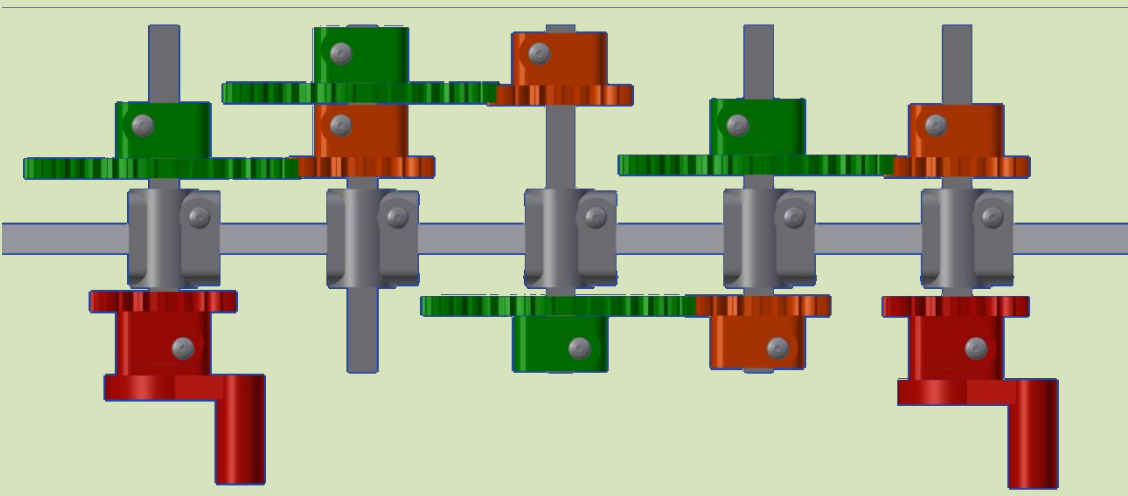| Fast Winding	
Criteria	Every time a crank handle is turned around once the reel turns around twice. This means that the rope and hook are wound in twice as fast.
Hint	Mount the crank handle and the reel on separate axles. Attach a large gear to the crank handle and a small gear to the reel. Every time the crank handle is turned around once 40 teeth of the large gear connect with the small gear. The small gear only has 20 teeth meaning the 40 tooth connections cause it to turn around twice.

Motorised Winding

Criteria	One push button causes the rope to extend. A second push button causes the rope to wind in.

Extra Fast Winding

Criteria	A full gear box means that when the crank handle turns around once the reel turns around 16 times.
Hint	**There is a separate "Gearbox" activity that describes how to build a gearbox. You should do this activity now.** This is the gearbox build described in that activity:

Rod Mounting and Fish Sensor

Criteria	The rod is mounted to a frame and spring-loaded using rubber bands. When a fish is caught it will pull on the "hook". This will cause the rod to hinge forward.
Hint	Attach the rod to the frame using an axle.

Fish Sensor Light

Criteria	When a fish is caught it will pull on the "hook". This will cause the rod to hinge forward. When the rod hinges forward it pushes a button. This will turn a light on and wind the rope in.

Automatic Winding (Simulator)

Criteria	Use the online electronics simulator, code **FSRD**.
	When a fish is caught it will pull on the hook.
	This will automatically cause the hook and the fish to be retracted into the boat.
Hint	Motorise the reel. Use a limit switch to detect when the rope is being pulled by the fish.

Quota - Fish Counter

Criteria	There is a catch limit of ten fish per day.
	A COUNTER counts every time a fish is wound in.

Fish Finder

Criteria	A buzzer sounds every time fish pass underneath the boat.
Hint	Use a laser beam and laser sensor to detect when there are any fish below the boat.

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