

# How to make a hydro turbine with housing

## 1. Before you start

- \* Watch the how to make a hydro turbine with housing video at <http://www.schoolgen.co.nz/make-and-play/maker-projects/make-a-hydro-turbine-with-housing/>
- \* Use a 3D printer and this template to print off the School-gen turbine and housing  
To find out more about 3D printing see our [3D tips and tricks](#) at [school-gen.co.nz](http://school-gen.co.nz).



## 2. What you'll need

- \* 3D printed hydro turbine
- \* 3D printed sides x2
- \* 3D printed bottom braces x2
- \* 3D printed shaft
- \* Nut and bolts (3mm in diameter and 12mm)
- \* Screw driver
- \* Optional: sandpaper
- \* Running water (your kitchen tap and sink will do)



## 3. Get started

### Step 1:

Take your 3D printed bottom braces and push them in to the bottom of the 3D printed sides. Make sure the word School-gen is facing outwards on the sides. Push them in firmly but don't force them. Use sandpaper on the braces to make them fit if you need to. Your sides and braces should now stand up by themselves ...this is the housing!

**Did you know** hydro turbines help us generate energy using the power of water.

### Step 2:

Now, grab your shaft and 3D printed turbine, hold it between the sides and push the shaft through one side, into the turbine and out through the other side.

### Step 3:

Make sure the bolt hole in the shaft is on the same side as the bolt hole on the turbine and the two are lined up. Use sand paper to make sure the holes are nice and smooth.

**Did you know** that the first electricity in New Zealand was generated in 1885 using a Pelton turbine in Coromandel.

**Step 4:**

Push or screw your bolt through the hole in the turbine, into the hole in the shaft and out the other side.

**Step 5:**

Secure the bolt with a nut.

**Step 6:**

Try spinning the turbine to make sure it's secure and spinning freely. Now it's time to test it!

**Did you know** this type of hydro turbine is called a Pelton turbine and it works best under a jet of high pressure water that contains a lot of energy due to its speed.

**Step 7:**

Turn your sink tap on until you get a gentle stream of water.

**Step 8:**

Place your hydro turbine with housing under the water. Move it around until you find the best spot to get the turbine spinning.

**4.  
Finished?  
What's  
next**

Visit [Schoolgen.co.nz](http://Schoolgen.co.nz) to check out other projects you can do.

We've also pulled together some cool challenges to get you thinking and innovating! The easiest ones are at the top of each list, the harder ones at the end are for budding scientists and engineers.

More minds are better than one so get a team together and start throwing some ideas around and come up with a plan of attack.

- ✳ Check out some interesting facts on the history of Hydro power in New Zealand
- ✳ Harness the energy of the spinning turbine to lift a small weight
- ✳ Make or improvise your own generator to generate electricity
- ✳ Calculate the efficiency of the turbine at converting gravitational potential energy into mechanical energy then into electrical energy

