Wonder Project

Power Challenge

# Activity 3.3: Time to test

**Will your turbine whip through the wind or spin in slow mo? Do some tests to see whether it's fit to power a town.**

You're going to perform two tests on your turbine. During each test, observe what is happening, and record the results. This will help you improve your turbine in the next module.

## Test 1: Prototype functionality

Engineers carry out functional tests to see if everything is working as it should – it helps detect early bugs!

### Give it a whirl!

Give the blades a gentle push.

### What do you see?

Are the blades balanced? Do they spin? Wobble?

### Nope, it's not spinning yet.

You're almost there. Troubleshoot with your support crew. What **design variables** can you change? Change one variable at a time and try again. Write the results below.

### Yes, it spins.

Congratulations! Time to power up your prototype.

## Test 2: Power up your prototype

Your second test will help you determine how different variables affect your turbine's performance.

For this test, you'll need:

- A printed circuit board (PCB)
- A fan (a 40cm desk fan will work best)

## Ask: How will our blade design impact our turbine's performance?

**Our conjecture:**

**We think our turbine will light up** ____ **lights.**

**We think this because:**

Connect your turbine to the PCB by plugging the connector cable from the turbine motor, into the wind input on your PCB.

Keep the fan speed and distance the same for each test so you're only observing the effect of one variable – blade design.

**Record your results in the test tracker.**

**Test Tracker**

| Rōpū name | Blade design | Pre-test conjecture | Post-test observation |
|---|---|---|---|
| *Turitea* | *Shape: Koru*<br>*Size: 15x3cm*<br>*Number: 4*<br>*Materials: Paper* | *Number of lights: 2*<br>*Why: Blade material is too flimsy.* | *Number of lights: 0*<br>*Why: Paper flopped in the wind. The turbine did not spin.* |
| | Shape:<br>Size:<br>Number:<br>Materials: | Number of lights:<br>Why: | Number of lights:<br>Why: |
| | Shape:<br>Size:<br>Number:<br>Materials: | Number of lights:<br>Why: | Number of lights:<br>Why: |
| | Shape:<br>Size:<br>Number:<br>Materials: | Number of lights:<br>Why: | Number of lights:<br>Why: |
| | Shape:<br>Size:<br>Number:<br>Materials: | Number of lights:<br>Why: | Number of lights:<br>Why: |
| | Shape:<br>Size:<br>Number:<br>Materials: | Number of lights:<br>Why: | Number of lights:<br>Why: |

## Analysis

What did you learn from your tests?

Which variables worked well? What didn't work well?

Does this result match with your conjecture? Why/why not?