Debugging

"It's Broken!"

Before you begin, **write** out or **say** out loud what **exactly** is wrong

Check the "simple" things first

- Does the **circuit** match the **schematic**
- Did a **wire** get **moved**/bumped?
- Are the **pin** numbers **correct**?
- Are there any **troubleshooting tips** in the documentation or example code?

Rubber Duck Debugging

Out loud, tell a **step by step** story of what should happen. Does your code and circuit match those steps?

Also, talk yourself through anything you did **right before** it stopped working. Could any of those be the issue?

Hypothesize possible issues

Make a tree or **list** of possible issues. Don't hesitate to brain dump anything that comes to mind!

Isolate and test each theory

Make a **test** for **each** possible issue. Maybe try a new LED or try some example code that doesn't have any of the extra code you've written.

Did you find the problem?

You might not have found anything, but hopefully you've started to **narrow** things down. Is it **hardware** or **software**? Does it happen all the time or just sometimes?

Now you know more! Try again! — No

Yes

Fix it

Does it work? — No

Congrats! You're one step closer!

Maybe that fixed it! Or maybe it is just one of several issues causing the problem. Or it could be an unrelated problem that you have saved your future self from!

Yes

Yay! Done!

This will get easier over time!