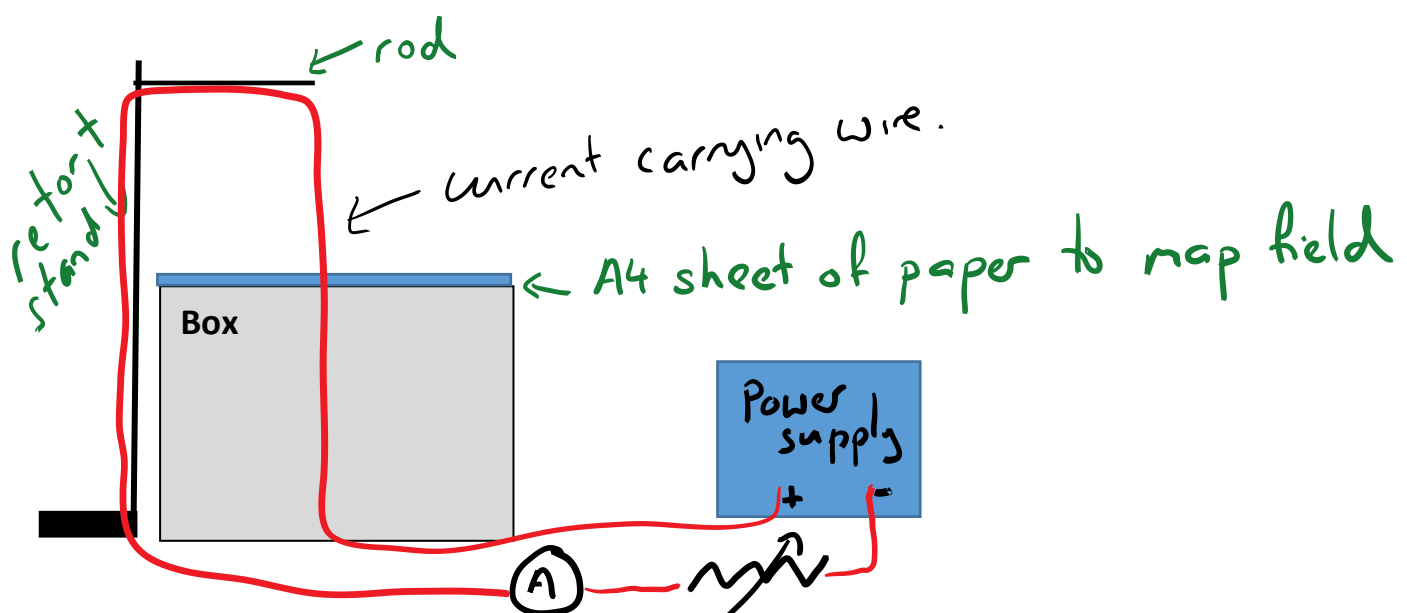


Exploring the vector addition of the magnetic field from a wire with the magnetic field from the Earth

Set up the apparatus below.

***** **Important safety notes** *****

- *Large currents* are required to observe magnetic fields, so power supply needs to be able to provide at least 4 A.
- All wires used must be suitable for large currents.
- This experiment should not be set up near ferrous materials, as they will interfere with the magnetic field measurements.
- This experiment is ideally carried out using a power supply for which the current can be controlled.
- Alternatively, a rheostat or variable resistor can be used to control the current, but care must be taken because the power rating of the rheostat or resistor will need to be very high (eg for 2V supply and 3A current, power rating of rheostat or resistor = 5.4W).



A compass is placed on the A4 template over one of the circles illustrated, and an arrow drawn inside the circle. By looking at the variation in the magnetic field experienced by the compass, students can observe the vector addition of the field from the Earth's magnetic field and the field from the current carrying wire.