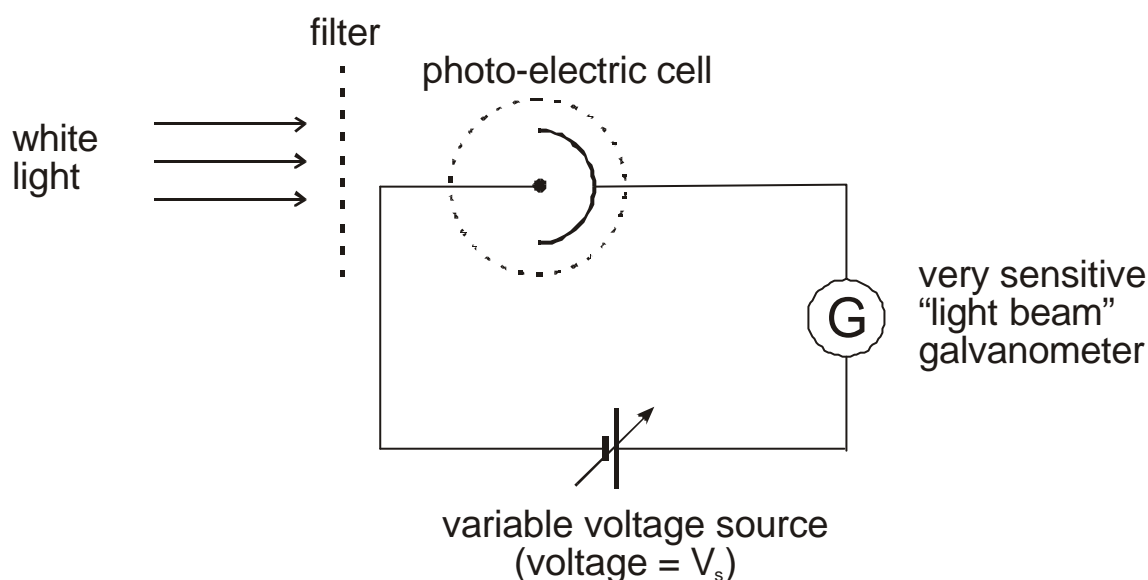


## Experiment to estimate the value of Planck's Constant using the Photo-Electric Effect

- Preparation:**
  - Revise the basic ideas of quantum theory, especially Einstein's photo-electric equation.
  - See below.

2. In this method, light is allowed to reach a photo-emissive surface (inside a "photo-cell"). This causes electrons to be emitted with a range of kinetic energies. A "stopping voltage" is then used to stop even the most energetic of the emitted electrons before they reach the cathode of the photo-cell. A simplified diagram of the apparatus is shown below.



Find the voltage,  $V_s$ , needed to reduce the reading of the galvanometer to zero with a range of different frequencies of light,  $f$ , reaching the photo-cell (different coloured filters).

Einstein's photo-electric equation can be stated as

$$eV_s = hf - W$$

Use this to find a value of Planck's constant,  $h$ .