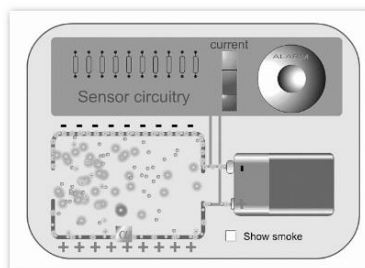


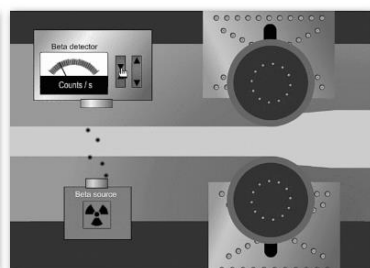
6.1 Non-medical uses

- Alpha is used when you want lots of ionisation - for example a smoke detector
- Beta can pass through thin sheets of paper or metal, so it's good for measuring thickness
- Gamma can pass through a metre or two of rock, soil or water, so it's good as a tracer
- Gamma can also penetrate delicate equipment and kill bacteria without causing too much heating

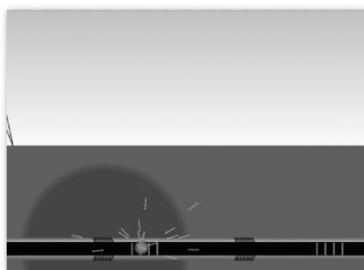
Alpha used in smoke detector



Beta thickness gauge



Gamma tracer



Gamma sterilisation



6.2 Medical uses

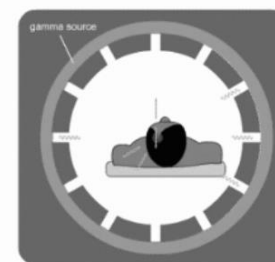
- Gamma radiation is used for medical imaging
- A gamma emitter is injected into the patient, and the gamma rays that leave the patient's body are captured using a special gamma camera
- Sometimes the gamma is produced indirectly when beta plus particles and electrons annihilate each other, which is how a PET scan works
- Gamma is also used to treat cancer
- A gamma source outside the patient is focused inwards towards the cancer and kills the cancer cells
- Beta emitters can also be used to treat cancer if they are injected very close to the cancer site

Imaging



Gamma emitter injected into patient, and gamma comes out

Cancer treatment



Gamma emitter is outside patient, and gamma focused in