All should: Describe the penetrating and ionising power of alpha, beta and gamma.

Most should: Describe the path of radiation types through a magnetic field.

Some should: Evaluate risks and uses of radiation depending on their penetrating and ionising power.

<table>
<thead>
<tr>
<th>Radiation</th>
<th>Type of particle</th>
<th>Source</th>
<th>Range in air</th>
<th>Stopped by</th>
<th>Ionisation</th>
<th>Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>alpha (α)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>beta (β)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gamma (γ)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Copy this table into your book, taking up a full page.
Alpha | Beta | Gamma
---|---|---
Small mass, high speed particle, positive charge | Smaller mass, higher speed particle, negative charge | High energy electromagnetic radiation (no mass)
How to Murder a Russian Spy

Was this Russian spy murdered? How?

• On 1 November 2006, Litvinenko suddenly fell ill and was hospitalized. He died three weeks later, becoming the first confirmed victim of lethal polonium-210-induced acute radiation syndrome.
Which type of radiation is most dangerous? Why do you think that?

Use the textbook pg 98-99 to write a definition for the words irradiation and contamination.

Write down three different precautions you should take if you are regularly working with radiation sources, and explain why they are sensible.

**Irradiation and Contamination**

**Irradiation** – exposure to a radioactive source outside the body

**Contamination** – when the radioactive source enters the body or gets on skin or clothes
Packaged vegetables are often exposed to radiation to kill any bacteria. This helps the vegetables last for longer.

Why is it NOT dangerous to eat irradiated vegetables?
STERILISATION

- **Ionising radiation kills bacteria**
- **Gamma radiation** can be used to sterilise surgical equipment, makeup and food (to prevent spoilage)
- Products first sealed from the air (**wrapper prevents contamination**), then exposed to the radiation. Gamma radiation passes through the sealed packet and kills the bacteria inside.
- In the UK ir**adiation** is permitted only for herbs and spices
  - Better than drying the herbs because it does not affect the taste
- Workers protected by thick shield, exposure is monitored and limited
1) Alpha particles ionise the air between the positive and negative terminals.
2) Charged ions mean that current can flow.
3) If smoke gets in the way it absorbs the ions.
4) There are therefore no ions and so current can’t flow.
5) Alarm goes off!
Beta radiation can be used to determine the thickness of aluminium foil.

1. Radon gas
2. Food and drink
3. Nuclear Discharges
4. Occupational exposure
5. Fallout
6. Gamma rays from the ground and buildings
7. Cosmic rays (from space)
8. Medical
The UK average annual dose is 2.5 mSv.