

1 Kaji pernyataan di bawah./Study the statement below. TP1

Sinaran mengion ialah sinaran yang menghasilkan ion positif atau ion negatif apabila melintasi udara.

The ionising radiation is the radiation that produces positive or negative ions when crossing the air.

Bulatkan sinaran mengion./Circle the ionising radiation.

Sinar gama <i>Gamma ray</i>	Radio <i>Radio</i>	Sinar-X <i>X-ray</i>	Gelombang mikro <i>Microwaves</i>
Sinaran ultraungu <i>Ultraviolet ray</i>	Inframerah <i>Infrared</i>	Cahaya nampak <i>Visible lights</i>	Sinar kosmik <i>Cosmic ray</i>

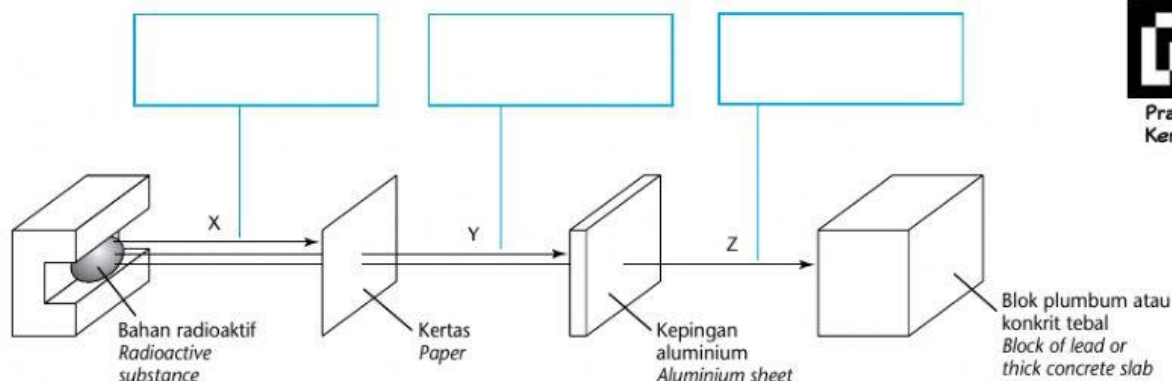
2 Bandingkan ciri-ciri sinaran radioaktif yang dipancarkan oleh bahan radioaktif. TP2

Compare the characteristics of radioactive radiations emitted by the radioactive substances.

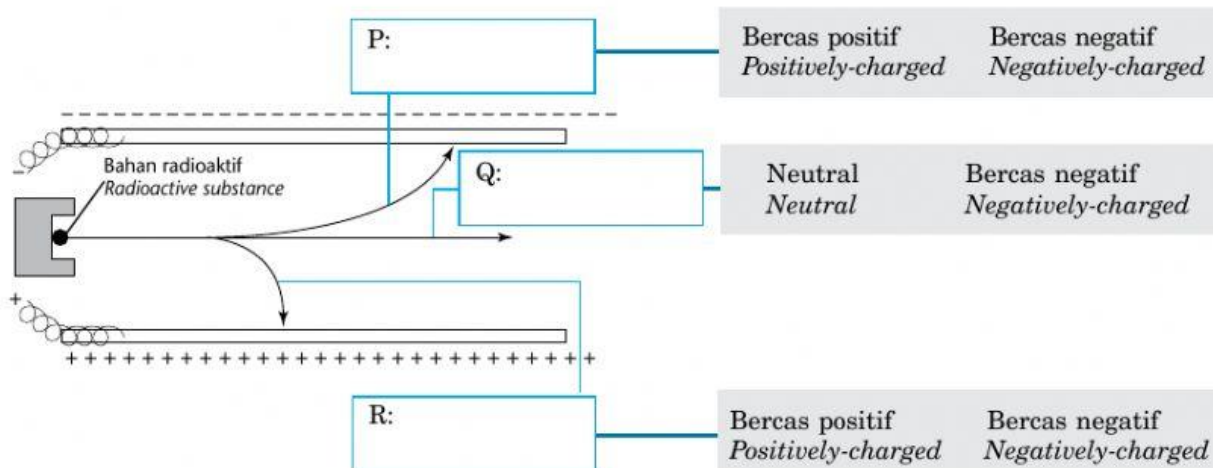
Positif <i>Positive</i>	Kertas <i>Paper</i>	Negatif <i>Negative</i>	Elektromagnet <i>Electromagnetic</i>	Konkrit <i>Concrete</i>	Neutral <i>Neutral</i>	Elektron <i>Electrons</i>	Rendah <i>Low</i>
Tinggi <i>High</i>	Sederhana <i>Moderate</i>	Perlahan <i>Slow</i>	Plumbum <i>Lead</i>	Helium <i>Helium</i>	Dipesong <i>Deflected</i>	Tidak dipesong <i>Not deflected</i>	Aluminium <i>Aluminium</i>

Ciri-ciri <i>Characteristics</i>	Jenis sinaran radioaktif/ <i>Type of radioactive radiation</i>		
	Sinaran alfa <i>Alpha rays</i>	Sinaran beta <i>Beta rays</i>	Sinaran gama <i>Gamma rays</i>
Jenis zarah <i>Type of particle</i>	Nukleus _____ _____ <i>nucleus</i>	_____ berhalaju _____/_____ <i>speed</i> _____	Gelombang _____ _____ <i>waves</i>
Cas/Charge			
Kuasa pengionan <i>Ionisation power</i>			
Kuasa penembusan <i>Penetration power</i>			
Dapat dihalang oleh <i>Can be stopped by</i>	Sehelai _____ <i>A piece of</i> _____	Sekeping _____ nipis <i>Thin</i> _____ <i>foil</i>	Blok _____ atau _____ tebal/ <i>A block of</i> _____ <i>or thick</i> _____
Pemesongan oleh medan elektrik <i>Deflection by electric field</i>	Dipesong oleh plat _____ <i>Deflected by a</i> _____ <i>plate</i>	Dipesong oleh plat _____ <i>Deflected by a</i> _____ <i>plate</i>	 Praktis Kendiri
Pemesongan oleh medan magnet <i>Deflection by magnetic field</i>			

- 1 Tentukan jenis sinaran radioaktif X, Y dan Z berdasarkan kuasa penembusannya. **TP2**
Determine the types of radioactive radiation, X, Y and Z, based on their penetration power.



- 2 Isi tempat kosong dan bulatkan jawapan tentang pemesanan sinaran radioaktif dalam medan elektrik. **TP2**
Fill in the blanks and circle the answers on the deflection of radioactive rays in an electrical field.



- 3 Namakan alat-alat di bawah yang digunakan untuk mengesan sinaran radioaktif atau mengesan tahap pendedahan kepada sinaran radioaktif. **TP1**
Name the devices below which are used to detect radioactive radiation or to detect the level of exposure to radioactive radiation.

Lencana filem (fotografi)
Film (photographic) badge



Pembilang Geiger-Muller
Geiger-Muller counter



Galeri Info

Pemesongan sinaran beta lebih daripada sinaran alfa dalam medan elektrik kerana jisim zarah beta adalah kurang daripada jisim zarah alfa.
The beta ray is deflected more than the alpha ray in electric field because the mass of beta particles is less than that of alpha particles.

- 1 Pelbagai jenis bahan seperti makanan, batuan, komputer dan televisyen menyinarakan sinaran mengion di persekitaran kita./Various substances radiate such as food, rocks, computers, and televisions, emit ionising radiations in our surroundings.

Tandakan (✓) jenis sinaran mengion tersebut. **TP1**

Mark (✓) the type of ionising radiation.

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Sinaran latar belakang
Background radiation

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Sinaran kosmik
Cosmic radiation



Praktis
Kendiri



Video

- 2 Baca petikan di bawah./Read the passage below.

Sinaran mengion yang melebihi dos tertentu yang diserap ke dalam badan boleh merosakkan sel-sel badan dan mungkin menyebabkan penyakit seperti kanser dan katarak. Unit pengukuran bagi dos sinaran latar belakang yang lazim digunakan ialah Mikrosievert/jam ($\mu\text{Sv/j}$). Dos sinaran latar belakang atau sinaran mengion yang kurang daripada **0.2 $\mu\text{Sv/j}$** atau **1.752 mSv/tahun** ialah aras normal atau aras selamat.

(1 mSv = 1000 μSv)

The over dose ionising radiation that is absorbed into the body can damage the body cells and may cause diseases like cancer and cataract. The commonly used measurement unit and symbol of the background radiation dose is Microsievert/hour ($\mu\text{Sv/h}$). The dose of the background radiation or ionising radiation which is less than **0.2 $\mu\text{Sv/h}$** or **1.752 mSv/year** is the normal level or the safe level.



Video

Tandakan (✓) anggaran dos sinaran mengion yang selamat kepada manusia dalam kehidupan harian.
Tick (✓) the estimated dose of ionising radiation which is safe to humans in daily life. **TP2**

- (a) Sinaran kosmik dalam penerbangan:
0.003 mSv/j
Cosmic ray in flight: 0.003 mSv/h


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- (b) Bangunan: 1.5 mSv/tahun
Buildings: 1.5 mSv/year


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- (c) Makanan: 0.1 – 0.5 mSv/tahun
Food: 0.1 – 0.5 mSv/year


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- (d) Merokok: 55 mSv/batang rokok
Smoking: 55 mSv/one cigarette


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- (e) Imbasan CT badan: 10 mSv/kali
CT scan body: 10 mSv/time


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- (f) Televisyen/Komputer: 10 $\mu\text{Sv/j}$
Television / Computer: 10 $\mu\text{Sv/h}$


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