

- 1 Namakan ahli sains dalam sejarah penemuan keradioaktifan.
Name the scientist in the history of radioactivity discovery.

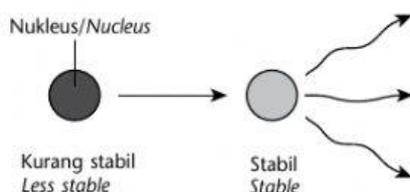
Henri Becquerel

Marie dan/and Pierre Curie

Wilhelm Roentgen

Ahli sains Scientist	Sumbangan Contribution
(a)	Ahli fizik Jerman yang menemukan sinar-X secara tidak sengaja dan mengambil gambar foto sinar-X tangan isterinya./A German physicist who discovered X-ray accidentally and took X-ray photographs of his wife's hand.
(b)	Ahli fizik Perancis yang menemukan keradioaktifan dan uranium yang memancarkan sinaran yang menghitamkan plat fotografi walaupun dalam keadaan gelap./A French physicist who discovered radioactivity and uranium which radiates rays that blacken the photographic plate even in dark conditions.
(c)	Pasangan suami isteri mengesan pancaran radioaktif melalui kuasa pengionannya dan mengekstrak polonium dan radium (radioaktif) daripada bijih uranium. <i>A couple detected radioactive emissions through their ionising power and extracted the polonium and radium (radioactive) from the uranium ore.</i>

- 2 Berdasarkan rajah keradioaktifan di bawah, jawab soalan-soalan berikut.
Based on the diagram of radioactivity below, answer the following questions.



- (a) Namakan proses ini./Name the process. **TP1**

- (b) Bulatkan jenis sinaran radioaktif yang terbebas. **TP1**
Circle the types of radioactive radiation released.

Alfa Alpha	Beta Beta	Sinar-X X-Ray	Gama Gamma
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- (c) Apakah unit pengukuran dan simbolnya bagi keradioaktifan pertama yang diperkenalkan oleh Marie dan Pierre Curie, iaitu unit bagi kadar pereputan nukleus yang tidak stabil? **TP1**
What is the first measurement unit of radioactivity and its symbol introduced by Marie and Pierre Curie, i.e. the unit of the rate of the decay of unstable nuclei?

- (d) Apakah unit S.I. dan simbolnya bagi keradioaktifan? **TP1**
What is the S.I. unit and its symbol for radioactivity?

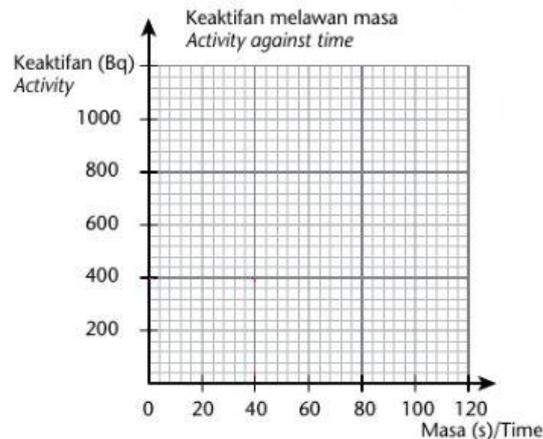
- (e) Tandakan (✓) unsur atau bahan radioaktif. **TP1**
Tick (✓) the radioactive elements or substances.

Karbon-12 Carbon-12	Kobalt-60 Cobalt-60	Karbon-14 Carbon-14	Iodin-131 Iodine-131
Uranium-238 Uranium-238	Fosforus-32 Phosphorus-32	Oksigen-16 Oxygen-16	Radium Radium
Torium-234 Torium-234	Radon-222 Radon-222	Uranium-235 Uranium-235	Hidrogen-1 Hydrogen-1



Jadual di bawah menunjukkan masa dan keaktifan bagi suatu bahan radioaktif.
The table below shows the time and activity of a radioactive substance.

Masa (s) Time (s)	Keaktifan (Bq) Activity (Bq)
0	800
20	560
40	400
60	280
80	200
100	120



- (a) Namakan tempoh masa yang diambil untuk bilangan nukleus yang belum mereput berkurang menjadi separuh daripada nilai asalnya. **TP1**
Name the time taken for the number of undecayed nuclei to reduce to half of its original value.

- (b) Berdasarkan data yang diberi dalam jadual di atas, lukiskan graf keaktifan melawan masa bagi bahan radioaktif itu pada rajah di atas.
Based on the data given in the table above, draw the graph of activity against time for the radioactive substance, in the diagram above.

- (c) Berapakah keaktifan asal bagi bahan radioaktif ini? **TP2**
What is the original activity of this radioactive substance?

- (d) Berapakah keaktifan pada separuh hayat bagi bahan radioaktif ini? **TP2**
What is the activity of the half-life of this radioactive substance?
 Keaktifan pada separuh hayat/Activity of the half-life

Galeri Info

Sepuluh hayat bahan radioaktif berbeza-beza daripada beberapa saat hingga beberapa juta tahun.
The half-life of radioactive substances varies from a few seconds to several million years.

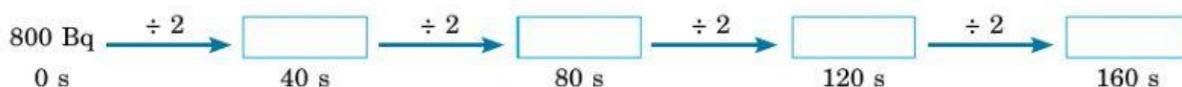


Video

- (e) Lukiskan pada graf di atas untuk menunjukkan bagaimana anda dapat menentukan separuh hayat bagi bahan radioaktif ini. **TP2**
Draw on the above graph to show how you can determine the half-life of this radioactive substance.

Sepuluh hayat/Half-life = _____

- (f) Lengkapkan peta alir untuk menentukan keaktifan bagi bahan radioaktif ini selepas 160 s. **TP2**
Complete the flow map to determine the activity of this radioactive substance after 160 s.



Keaktifan bagi bahan radioaktif selepas 160 s
The activity of the radioactive substance after 160 s = _____ Bq