**Task 3: Answer the questions; add your answers to the grid to find the number to unlock lock 3.**

|  |  |
| --- | --- |
| **Type of radiation** | **RADIATION WEIGHTING FACTOR** |
| **X-rays** | **1** |
| **γ rays** | **1** |
| β-particles (E<30KeV) | **1.7** |
| β-particles (E>30KeV) | **1** |
| **α particles** | **20** |
| **heavy nuclei** | **up to 20** |
| **protons** | **10** |
| **slow neutrons** | **2.3** |
| **fast neutrons (1Mev)** | **10** |
| **really fast neutrons (10Mev)** | **6.5** |

* 1. If a school source has an activity of 6.4 x104Bq, calculate the number of disintegrations in one hour.

1. A patient’s thyroid gland is to receive an absorbed dose of 500.0 Gy from a source so that the gland absorbs 15.0 J of energy. From this information calculate the mass of the thyroid gland.
2. A source has an activity of 40.0 **M**Bq and a half life of 125.7 s. Calculate the time taken for its activity to drop to 625 **k**Bq.
3. A sample of tissue has a mass of 25.0 g, Determine the energy absorbed in 5.0 hours from fast moving neutrons with an absorbed dose rate of 400μGyh-1.

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**Task 3: ANSWER GRID**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | ⋅ |  | × | 1 | 0 |  |
|  |  |  | ⋅ |  |  | kg |  |  |  |
|  |  |  | ⋅ | s |  |  |  |  |  |
|  |  |  | ⋅ |  | × | 1 | 0 |  |  | J |

**Task 3: ANSWER GRID**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | ⋅ |  | × | 1 | 0 |  |
|  |  |  | ⋅ |  |  | kg |  |  |  |
|  |  |  | ⋅ | s |  |  |  |  |  |
|  |  |  | ⋅ |  | × | 1 | 0 |  |  | J |

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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | ⋅ |  | × | 1 | 0 |  |
|  |  |  | ⋅ |  |  | kg |  |  |  |
|  |  |  | ⋅ | s |  |  |  |  |  |
|  |  |  | ⋅ |  | × | 1 | 0 |  |  | J |

**Task 3: ANSWER GRID**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | ⋅ |  | × | 1 | 0 |  |
|  |  |  | ⋅ |  |  | kg |  |  |  |
|  |  |  | ⋅ | s |  |  |  |  |  |
|  |  |  | ⋅ |  | × | 1 | 0 |  |  | J |

**Task 3: Answers**

**1.**

**2.**

**3.40M→20M→10M →5M →2.25M →1.125M →625k**

**6 half lives, each is 125.7s so total time is**

**4.**

|  |  |
| --- | --- |
|  |  |
|  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 2 | ⋅ | 3 | × | 1 | 0 | 8 |
|  |  | 0 | ⋅ | 0 | 3 | kg |  |  |  |
| 7 | 5 | 4 | ⋅ | s |  |  |  |  |  |
|  |  | 5 | ⋅ | 0 | × | 1 | 0 | - | 6 | J |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 2 | ⋅ | 3 | × | 1 | 0 | 8 |
|  |  | 0 | ⋅ | 0 | 3 | kg |  |  |  |
| 7 | 5 | 4 | ⋅ | s |  |  |  |  |  |
|  |  | 5 | ⋅ | 0 | × | 1 | 0 | - | 6 | J |