

Particle Nature of Light Definitions

Learn them word for word: the highlighted words are the ones the examiner looks for.

1 Photon

A **discrete packet** of **electromagnetic radiation energy**.

2 Energy level

A **specific energy** of (an **electron** in) an **atom**.

3 Excited

An **atom** (with an **electron**) in an **energy level above the ground state**.

4 Ground state

An **atom** (with an **electron**) in the **lowest energy level**.

5 Why are emission spectra unique to each element?

1. **Energy is transferred** to an electron in an atom
2. from a **photon / free electron**
3. the bound electron **transitions to a higher energy level**
4. the electron then **transitions to a lower energy level**
5. a **photon is emitted** whose energy **equals the difference in energy levels**
6. the photon's **energy is directly proportional to its frequency**
7. **each element has a specific difference in energy levels**
8. so also **emits specific frequencies** of light

6 Why are absorption spectra unique to each element?

1. **Energy is transferred** to an electron in an atom
2. from a **photon / free electron**
3. a **photon is absorbed** whose energy **equals the difference in energy levels**
4. the photon's **energy is directly proportional to its frequency**
5. **each element has a specific difference in energy levels**
6. so also **absorbs specific frequencies** of light, which are **missing from the spectrum** of light (emitted from stars)



Stick me by your desk.

Read me every time you sit down. Cover the right-hand column and say each one out loud. Practise online:
[physicswithkate.com/a-level-waves-and-particle-nature-of-light-definitions](https://www.physicswithkate.com/a-level-waves-and-particle-nature-of-light-definitions)