



# A Level Physics Online

## Eduqas Physics – Component 3

### Module 5: Lasers

This topic covers the process of stimulated emission and how this leads to coherent light emission. The structure of lasers is studied, including how a population inversion is attained. The advantages and disadvantages of different types of laser are compared.

| You should be able to demonstrate and show your understanding of:   | Progress and understanding: |   |   |   |
|---|-----------------------------|---|---|---|
|   | 1                           | 2 | 3 | 4 |
| The process of stimulated emission and how this process leads to light emission that is coherent  |                             |   |   |   |
| The idea that a population inversion ( $N_2 > N_1$ ) is necessary for a laser to operate  |                             |   |   |   |
| The idea that a population inversion is not (usually) possible with a 2-level energy system   |                             |   |   |   |
| How a population inversion is attained in 3 and 4-level energy systems  |                             |   |   |   |
| The process of pumping and its purpose  |                             |   |   |   |
| The structure of a typical laser i.e. An amplifying medium between two mirrors, one of which partially transmits light  |                             |   |   |   |
| The advantages and uses of a semiconductor laser i.e. Small, cheap, far more efficient than other types of laser, and it is used for CDs, DVDs, telecommunication etc |                             |   |   |   |

