Appendix 1 IB Objectives

14.2. Data Capture; digital imaging using charge-coupled devices (CCDs)

14.2.1. Define capacitance

14.2.2. Describe the structure of a charge-coupled device (CCD).

14.2.3. Explain how incident light causes charge to build up within a pixel.

14.2.4. Outline how the image on a CCD is digitized.

14.2.5. Define quantum efficiency of a pixel

14.2.6. Define magnification

14.2.7. State that two points on an object may be just resolved on a CCD if the images of the points are at least two pixels apart.

14.2.8. Discuss the effects of quantum efficiency, magnification and resolution on the processed image.

14.2.9. Describe a range of practical uses of a CCD, and list some advantages compared with the use of film.

14.2.10. Outline how the image stored in a CCD is retrieved.

14.2.11. Solve problems involving the use of CCDs.

Additional Vocabulary

Fidelity: similarity between the original signal and the reproduced signal.
Perfect reproduction: the recording sounds the same no matter how many times you play it.
ADC: analog-to-digital converter.
DAC: digital-to-analog converter.
Sampling rate: controls how many samples are taken per second.
Sampling precision: controls how many different gradations are possible when taking the sample.