3.8 Photosynthesis – *summary of mark schemes*

3.8.7	Explain that the rate of photosynthesis can be measured directly by the production of oxygen or the uptake of carbon dioxide, or indirectly by an increase in biomass. Mark Scheme A. production of oxygen; B. (because) oxygen is a byproduct of the reaction; C. count bubbles of oxygen (from pondweed); D. measure the volume of oxygen; E. use of oxygen probe find oxygen concentration; F. measure carbon dioxide uptake; G. (because) carbon dioxide is a raw material of the reaction; H. measure colour change of pH indicator / other method; I. use of carbon dioxide probe to find carbon dioxide concentration; J. measure increase in biomass; K. (because products) used in production of cell walls and new tissue; L. harvest replicate samples at time intervals for biomass determination; M. by measuring the production of glucose / starch / other suitable molecule;
3.8.8	Outline the effects of temperature, light intensity and carbon dioxide concentration on the rate of photosynthesis. Mark Scheme light: A. rate of photosynthesis increases as light intensity increases; B. photosynthetic rate reaches plateau at high light levels; C. chlorophyll is composed of a number of pigments; D. absorb different colours of light; E. mainly red and blue absorbed; F. green light reflected CO2 G. photosynthetic rate rises as CO2 concentration rises; H. up to a maximum when rate levels off; temperature: I. rate of photosynthesis increases with increase in temperature; J. up to optimal level / maximum; K. up to a point where enzymes denature; L. high temperatures reduce the rate of photosynthesis;