(Rate of photosynthesis (practical, light intensity calculations – inverse square law is Higher))

Q1.a)(2019)

LHS:
carbon dioxide **and** water

RHS:
glucose

Q1.b)(2019)

power output of bulb

Q1.c)(2019)

any **two** from:

- repeat **and** calculate a mean
  or
  repeat **and** to eliminate anomalies
- control the (water) temperature
- control the concentration of carbon dioxide
- control the distance of the bulb from the pondweed
- control the mass / length / species / age of the pondweed
- give pondweed time to equilibrate

Q1.d)(2019)

3.3 (cm^3/hour)

Q1.e)(2019)

correct scale **and** axis labelled

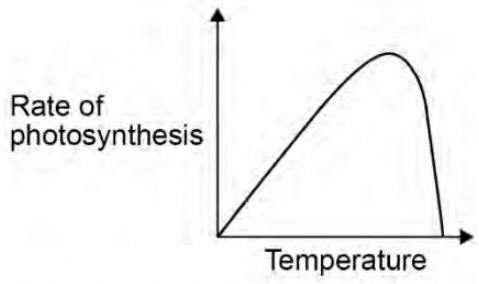
all points plotted correctly

correct curved line of best fit

Q1.f)(2019)

correct answer from their line drawn on **Figure 15**

Q1.g)(2019)



Q2.a)(2020)

$$\frac{(18.5 + 19.3 + 19.5)}{3}$$

or

$$\frac{57.3}{3}$$

19.1 (cm^3/hour)

Q2.b)(2020)

a ring around 14.2

Q2.c)(2020)

any **one** from:

- scale / value was misread
- there was air / oxygen in the syringe / measuring cylinder / apparatus
- the lamp / light was moved

- temperature changed
- had different mass / length of pondweed
- pondweed had not acclimatised

Q2.d)(2020)

did not use it in calculation (of mean)

Q2.e)(2020)

any **one** from:

- light (intensity)

- carbon dioxide (concentration)
- pondweed size / amount
- pondweed species

Q3.a)(2023)

any **one** pair from:

- bulb / lamp is hot

  (so) may burn you / skin

- glassware is breakable (1)

  (so) may cut skin (1)

- electricity in close proximity to water (1)

  (so) may get electric shock (1)

- scissors / scalpel (to cut pondweed) are sharp (1)

  may cut skin (1)

Q3.b)(2023)

(use a) water bath

Q3.c)(2023)

(change in) temperature affects / changes (the rate of) photosynthesis

(so) will affect / change the number of bubbles (produced)

Q3.d)(2023)

blue

Q3.e)(2023)

bar graph

Q3.f)(2023)

any **one** from:

- measuring cylinder
- (gas) syringe
- burette

Q3.g)(2023)

as light (intensity) increases, rate / photosynthesis increases

(rate / photosynthesis increases) at the same rate as light (intensity)