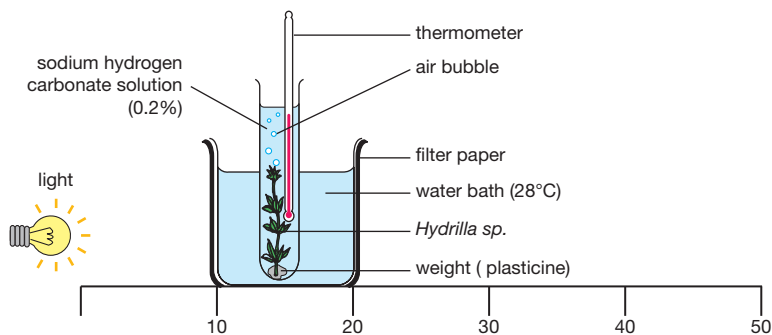


## EXPERIMENT 2.2

### Identifying the best light colour for the maximum rate of photosynthesis in aquatic plants



#### Problem statement

How does the colour of light affect the rate of photosynthesis?

#### Hypothesis

The rate of photosynthesis is the highest in red and blue light.

#### Variables

- Manipulated: Filter papers of different colours
- Responding: Number of gas bubbles released in one minute
- Constant: Type of plant, percentage of sodium hydrogen carbonate solution in the solution and voltage of the bulb

**Materials:** A few strands of *Hydrilla* sp., 0.2% sodium hydrogen carbonate solution, distilled water and plasticine, green, red, blue and yellow filter papers

#### Apparatus

A 60 W bulb, a 500 ml beaker, a boiling tube, a stopwatch, a razor, a thermometer, a metre rule, a retort stand with clamps

#### Procedure

- 1 The temperature of water in the beaker is maintained at 28°C.
- 2 The beaker is wrapped with green filter paper.
- 3 A few strands of *Hydrilla* sp. are chosen.
- 4 A boiling tube is filled with 0.2% sodium hydrogen carbonate solution.
- 5 A clean oblique cut is made with a sharp razor near the lower end of the *Hydrilla* sp. stem under water.
- 6 The aquatic plant is placed with the bubbling end upwards, inside the boiling tube.
- 7 The apparatus is placed at a distance of 10 cm from the light source.
- 8 After the plant releases bubbles at a constant rate, the number of gas bubbles released in one minute is counted. This step is repeated twice.
- 9 Step 6 is repeated by wrapping the beaker with different coloured filter papers.
- 10 The results are recorded in a table and a bar chart on the number of gas bubbles released in one minute against the colour of the filter paper is plotted.

#### Results

Treatment	Without filter paper	Blue filter paper	Red filter paper	Yellow filter paper	Green filter paper
Number of gas bubbles released in 1 minute					

#### Discussion

- 1 The blue and red filter papers produce blue and red light respectively.
- 2 In blue and red light, the aquatic plant releases the highest number of gas bubbles. Hence, the rate of photosynthesis is the highest.

#### Conclusion

The rate of photosynthesis is the highest in red and blue light.