

Value Based Questions

1. A boy tries to hit a bird by throwing a stone vertically upward but the stone misses the bird. The stone goes upwards in the air for 3 s. While returning after 1 second the stone hits the bird.

Answer the following questions based on the information given:

(i) Find the maximum height reached by the stone.

(ii) At what height was the bird hit?

(iii) What value is not shown by the boy?

Ans. (i) Time of ascent = 3s

Initial velocity = u

Final velocity, v = 0 m/s

Acceleration, a = g = - 9.8 m/s²

$$\therefore v = u + at$$

$$\Rightarrow 0 = u + (-9.8) \times 3$$

$$\Rightarrow 0 = u - 29.4$$

$$\therefore u = 29.4 \text{ m/s}$$

$$\therefore \text{Maximum height of the stone reached} = \frac{v^2 - u^2}{2a}$$

$$[\because v^2 - u^2 =$$

$$= \frac{(0)^2 - (29.4)^2}{2 \times (-9.8)} = \frac{-864.4}{-19.6} = \mathbf{44.1 \text{ m}}$$

(ii) The bird was hit after a second while returning.

$\therefore$ Initial velocity, u = 0 m/s

Distance travelled = s

Time taken = 1 s

Acceleration, a = g = 9.8 m/s²

$$s = ut + \frac{1}{2}gt^2$$

$$= 0 \times 1 + \frac{1}{2} \times 9.8 \times (1)^2 \text{ m} = 0 + \left(\frac{1}{2} \times 9.8\right) = \mathbf{4.9 \text{ m}}$$

The height of the bird from the ground = 44.1 m - 4.9 m = 39.2 m

(iii) Each and every living organism is a part and parcel of our life, because living organisms maintain biodiversity on earth. Therefore, we should treat the living beings in a polite way. This value is not shown by the boy as he hits the bird.