Mathematics at the Gardens!

Instructions for Teachers

- **Venue: Supertree Grove**
- **Estimated duration to complete Questions 1 to 6 at the Supertree Grove: 1 hr 30 min**
- **Ensure that students bring along a pen, calculator, measuring tape and stopwatch for the trail**
- **Ensure that students are well-hydrated before you begin this learning journey.**

Answers for Teachers

At the Supertree Grove:

1a)
i) Volume of smaller cuboid = $221.5 \times 22.5 \times 20$ **cm³**
= **99675 cm³**

ii) Volume of bigger cuboid = $229.5 \times 51 \times 30.5$ **cm³**
= **356, 987.25 cm³**

1b) Volume of whole solid = **(0.099675 + 0.35698725) m³**
= **0.45666225 m³**

2a) Distance = 250 cm

2b) I assume the path of the water is a straight line but the actual path of the water is slightly curved, thus the answer I obtained by using a measuring tape would be less than the actual distance.

2c) Rate of water flow = $\frac{350}{1.2}$ **cm³/s**
= **291.67 cm³/s**
= **292 cm³/s**

3a) Area of inner circle = $3.142 \times 120.5 \times 120.5$ **cm²**
= **45,622.6255 cm²**

3b) Area of outer circle = $3.142 \times 218.5 \times 218.5$ **cm²**
= **150,006.1495 cm²**

3c) Area of the annulus = $15.00061495 - 4.56226255$ **m²**
= **10.4383524 m²**
= **10.4 m²**

4a) Time = 20.89 s

4b) Speed of lift = $\frac{26}{20.89}$ **m/s**
= **1.244 m/s**
= **1.24 m/s**

4c) Height of 1 storey = $\frac{26}{7}$ **m**
= **3.714 m**
= **3.71 m**

5a) a **= 86cm,** b **= 110.6 cm,** c **= 140.1 cm.**

5b) $a^2 + b^2 = 86^2 + 110.6^2$
= **19,628.36**

5c) $c^2 = 140.1^2$
$= 19{,}628.01$

5d) The values are almost equal. The sum of the square of the length and breadth of a rectangle is equal to the square of the diagonal of the same rectangle.

6a) Actual perimeter of figure *ABC* = 105 cm

6b) Estimated perimeter of figure *ABC* = 40.5 + 35 + 26
= 101.5 cm

6c) Difference between actual and estimated perimeter = $105 - 101.5$
= 4.5 cm

6d) Percentage error in perimeter measurement = $\frac{4.5}{105} \times 100\%$
= 4.285%
= 4.29 %

This activity sheet was developed in collaboration with Temasek Secondary School.