

# Modelling Trig Equations

**Goal:**

- Can make trig equations to model situations.

**Terminology:**

- None

**Example:** Sales of snowshoes at MEC are seasonal with the most occurring in November at 400 units sold and basically none are sold 6 months later. Determine an equation for the sales in terms of time and determine when 300 units are sold.

**Example:** A normal adult breathes in and exhales about 0.84 L of air every 4 seconds. When they exhale, the minimal amount in the lungs is 0.08 L. Determine an equation for the volume of air in their lungs at time  $t$ . Determine how long in one cycle they will have more than 0.5 L of air in their lungs.

**Example:** A windmill has three blades that are 120 feet long and the propeller spins once every 5 seconds. If the center of the windmill blades are 320 feet above the ground and the blades are spaced evenly apart determine an equation for the height of each blade above the ground at time  $t$ .

**Example:** The phase of the moon follows a sinusoidal path. On October 16, 2020 there was a new moon (it was be 0% visible) and on October 31, 2020 there will be a full moon (100% visible). Make an equation for the days in NOVEMBER the determine how much the moon is visible. Use it to determine the days when the moon is 30% visible.

**Example:** A low tide of 4.2 m in White Rock occurs at 4:30 AM and the next high tide of 11.8 m occurs at 11:30 AM. Determine an equation for the height of the tide at time  $t$  in hours. Determine the times in that day when the tide is 9 m.

<b>Suggested Practice Problems:</b> 5.4 # 4, 5, 8, 11, 15-23
<b>Textbook Reading:</b> page 266-273 Key Ideas page 274
<b>Next Class:</b> Trig Identities