WIND STUDY

Wind Study is intended for grades 5-8 and 8-11
Questions posted on: Monday Answers posted on: Friday
Find downloadable one pagers at www.oneenergy.com/one-energy-feed

2021Q14 (GRAPHING, EXPONENTS)

When siting a wind turbine, One Energy has to understand what the wind speeds will be like at hub height. Surface level wind speeds are typically lower than hub height wind speed, and the way the wind speeds change with increased height varies depending on the location. Wind speed is influenced by the local topography and land cover, among other things. Land cover describes what the surface is covered by – wind will behave differently over a forest than over a farmer's field, for example.

Level 1: Make a graph of the height vs wind speed given in the table below. How would you describe the relationship between wind speed and height?

WIND SPEED (M/S)	HEIGHT (M)
5.1	25
5.5	30
5.7	35
5.7	40
5.9	50
6.0	55
6.1	60
6.3	70
6.4	80
6.7	90

Level 2: In the Wind Study posted on March 1st, 2021, we discussed the wind profile power law. The equation for this law is shown below:

$$v_2 = v_1 \left(\frac{z_2}{z_1}\right)^{\alpha}$$

Calculate the value of alpha between the 80 and 90 m measurement heights.

An operating Wind for Industry® project.