2021A9 (BINNING, EXTRAPOLATION)

Level 1: To bin the wind speeds, we need to round each data point to the nearest half m/s. Remember that the bins are centered around their respective wind speeds.

TIME STAMP	WIND SPEED (m/s)	ROUNDED WIND SPEED (m/s)
14:00	9.353	9.5
15:00	9.174	9.0
16:00	9.363	9.5
17:00	8.884	9.0
18:00	7.166	7.0
19:00	5.794	6.0
20:00	5.471	5.5
21:00	5.352	5.5
22:00	5.311	5.5
23:00	7.410	7.5
0:00	6.950	7.0
1:00	7.288	7.5
2:00	5.989	6.0
3:00	5.363	5.5

Now that the wind speeds have been rounded, we can count how many fall into each bin.

BIN (m/s)	# OF DATA POINTS
5.0	0
5.5	4
6.0	2
6.5	0
7.0	2
7.5	2
8.0	0
8.5	0
9.0	2
9.5	2

Level 2: Start by filling in the known values.

$$v_2 = 9.353 \frac{m}{s} * \left(\frac{80\ m}{50\ m}\right)^{0.2}$$

Then solve the equation to find the extrapolated wind speed.

$$v_2 = 9.353\ \frac{m}{s} * (1.6)^{0.2}$$

$$v_2 = 9.353\ \frac{m}{s} * 1.099$$

$$v_2 = 10.279\ m/s$$

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

Wind instrumentation devices in front of a wind turbine – note the height difference.