WIND STUDY

Wind Study is intended for grades 5-8 and 8-11
Questions posted on: Monday   Answers posted on: Friday
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2021A15   (TRANSFORMER, VOLTAGE)

Level 1: To calculate the turns ratio, substitute the given voltages into the equation.

$$Turns\ Ratio = \frac{V_1}{V_2}$$

The primary coil is that coming from the turbine, so V_1 will be 620 V and V_2 will be 12,470 V.

$$Turns\ Ratio = \frac{620\ V}{12{,}470\ V}$$

$$Turns\ Ratio = \frac{62}{1{,}247}$$

Level 2: The coil that has a higher voltage will have more turns because they are directly proportional. This means the secondary coil will have more turns in the scenario from level 1.

For the second part of level 2, we need to use the Turns Ratio again.

$$Turns\ Ratio = \frac{620\ V}{34{,}500\ V}$$

$$Turns\ Ratio = \frac{31}{1725}$$

In this case, the voltage needs to be increased higher than in the first example. Therefore, the number of turns in the secondary coil must be increased as well because they are directly proportional.

An operating Wind for Industry® turbine.