

Name: \_\_\_\_\_ Per: \_\_\_\_\_

\*\*\*This is not a “binder” assignment. It will be turned in separately\*\*\*

# WIND TURBINE ENGINEERING HONORS PROJECT

Your project for the honors component for Quarter 4 is to design a wind turbine that will generate 0.1 volts of electricity following the engineering design process.

**Wind Turbine Test Date: A day-April 19<sup>th</sup>/B day-April 20<sup>th</sup>**

**Written Assessment Due Date: A day-April 25<sup>th</sup>/B day-April 26<sup>th</sup>**

## Assignment Requirements:

### Blade Assembly:

- Blade assembly must be attached to a 12 cm diameter standard CD and not cover the CD mount (opening in the center)
- The total size of the blade assembly may not be more than 40 cm in diameter.
- The blade assembly must be made of only Nonmetallic substances.
- No commercial blade assemblies allowed (you must make your own)
- Your investigation must be qualitative AND quantitative... it MUST be measurable with numbers.

\*\*\*If you cannot complete this at home, please arrange a time with your teacher to use the lab after school.

### Wind Turbine Test:

- Blade attached to a standard CD/not covering the mount \_\_\_\_\_/2pts
- Diameter  $\leq$  40cm \_\_\_\_\_/2pts
- Nonmetallic \_\_\_\_\_/1pts
- Blade engineered by student \_\_\_\_\_/1pts
- Neat/clean design \_\_\_\_\_/2pts
- Generates  $\geq$  0.1 volts \_\_\_\_\_/2pts

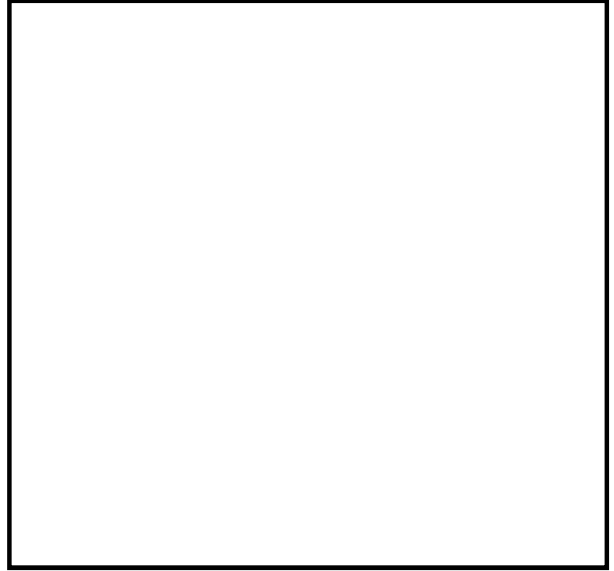
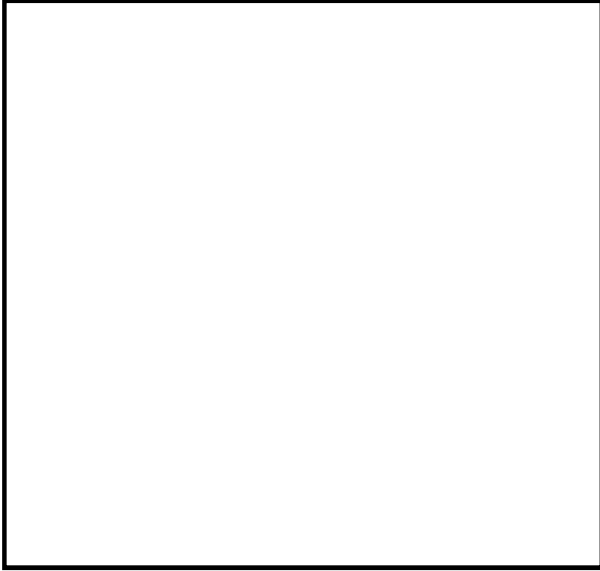
**You will get an automatic 0 if you do not build your blade yourself. Be ready to answer questions about the design.**

Wind Turbine Test Subtotal \_\_\_\_\_/10pts



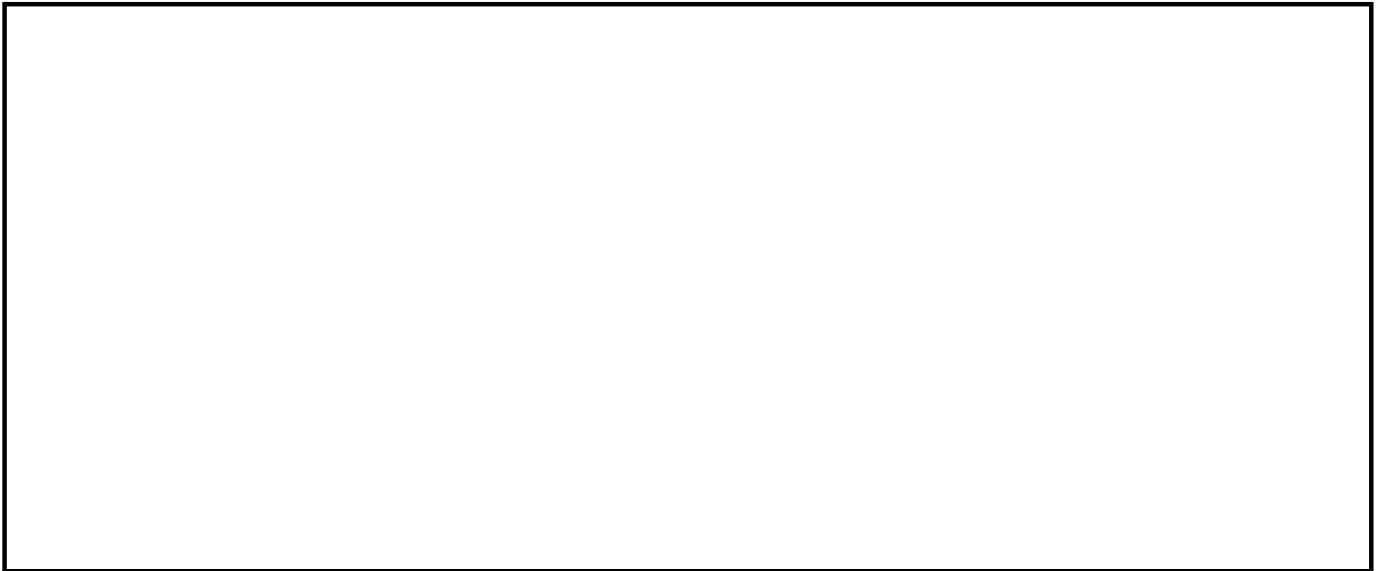
# ENGINEERING PROCESS WRITTEN ASSESSMENT

**Imagine:** Brainstorm several ideas you have for how to build your wind turbine. Draw pictures of 2 different possible designs.



\_\_\_\_\_/2pts

**Design:** Draw out your best wind turbine design. Be sure to include metric measurements and label what materials you are using to build each part.



\_\_\_\_\_/3pts



Science • Technology • Engineering • Math

**Building materials:** List how much of each material you are using to build your wind turbine. Write down specific steps you are taking to build your wind turbine. **Make sure you labeled the materials in your design!**

# Building Materials

Procedure (steps)

\_\_\_\_\_/4pts

**Test:** You will need to bring your Wind Turbine to school with you on or before the due date and test your wind turbine with your teacher. **You must generate at least 0.1 volts of electricity when tested.**

Volts generated \_\_\_\_\_

Teacher signature \_\_\_\_\_

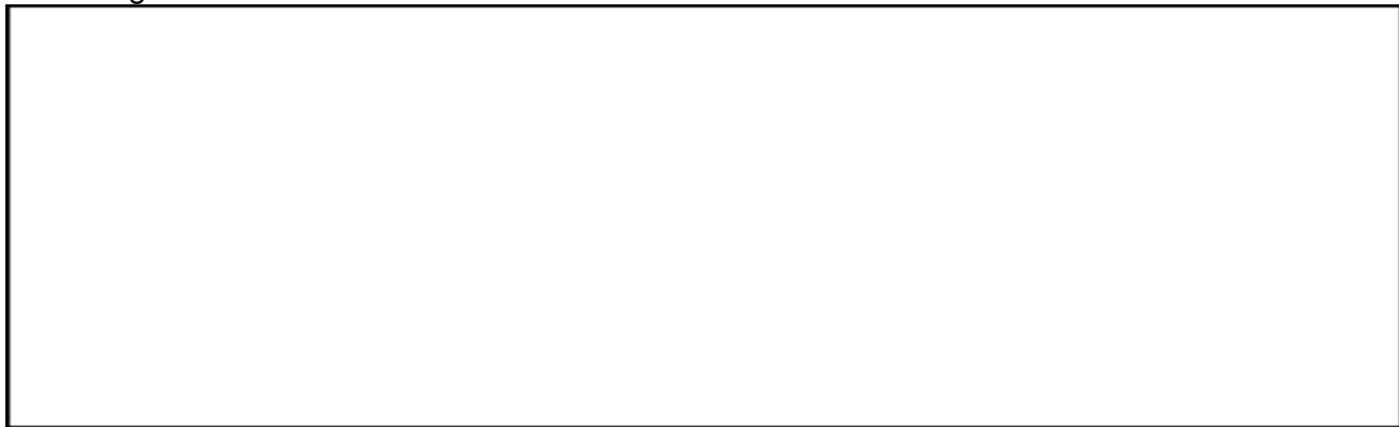
\_\_\_\_\_/4pts

**Improve:** What are two ways you can change your Wind Turbine to make it better?

1-	
2-	

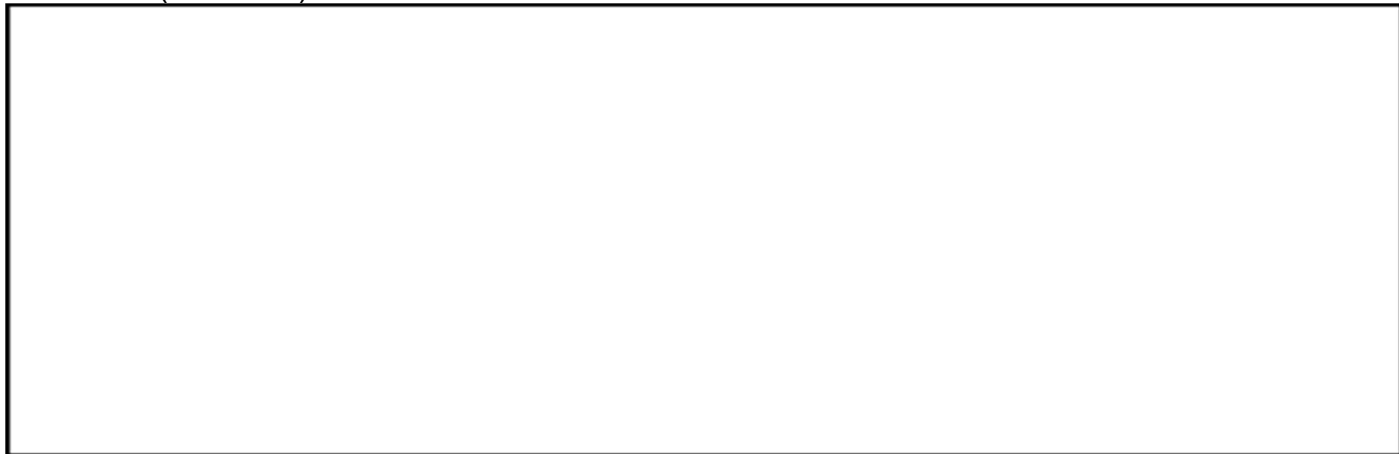
\_\_\_\_\_/2pts

Data (Quantitative Observations): Your engineering process must include data with numbers. You must display this as a graph or chart. For example: “Distance from Fan vs. Voltage” or “Fan Speed vs. Voltage”.



\_\_\_\_\_/3pts

Qualitative Observations: What are some things about your design you notice that don't involve numbers? (at least 2)



\_\_\_\_\_/2pts

Written Assessment Subtotal \_\_\_\_/20pts

Wind Turbine Test Subtotal \_\_\_\_/10 pts

**Total Score**\_\_\_\_\_/30pts

\*\*\*In order to receive Honors Credit for 8<sup>th</sup> grade science for Quarter 4, students must achieve “Mastery” on this project of 80%. A mastery score on this project is 24/30 or higher. Students must achieve mastery by turning the project in on or before the due date and achieve the mastery score on the first attempt. The score for this project does not go on the student's grade. Achieving mastery on this project will give the student “8<sup>th</sup> Grade Honors Science” credit on their transcript.