

## **Team Info and Research Statement**

Team Name: *Team Cyclone*

Team Members: Ben, Caleb, Henry

### **Team Info**

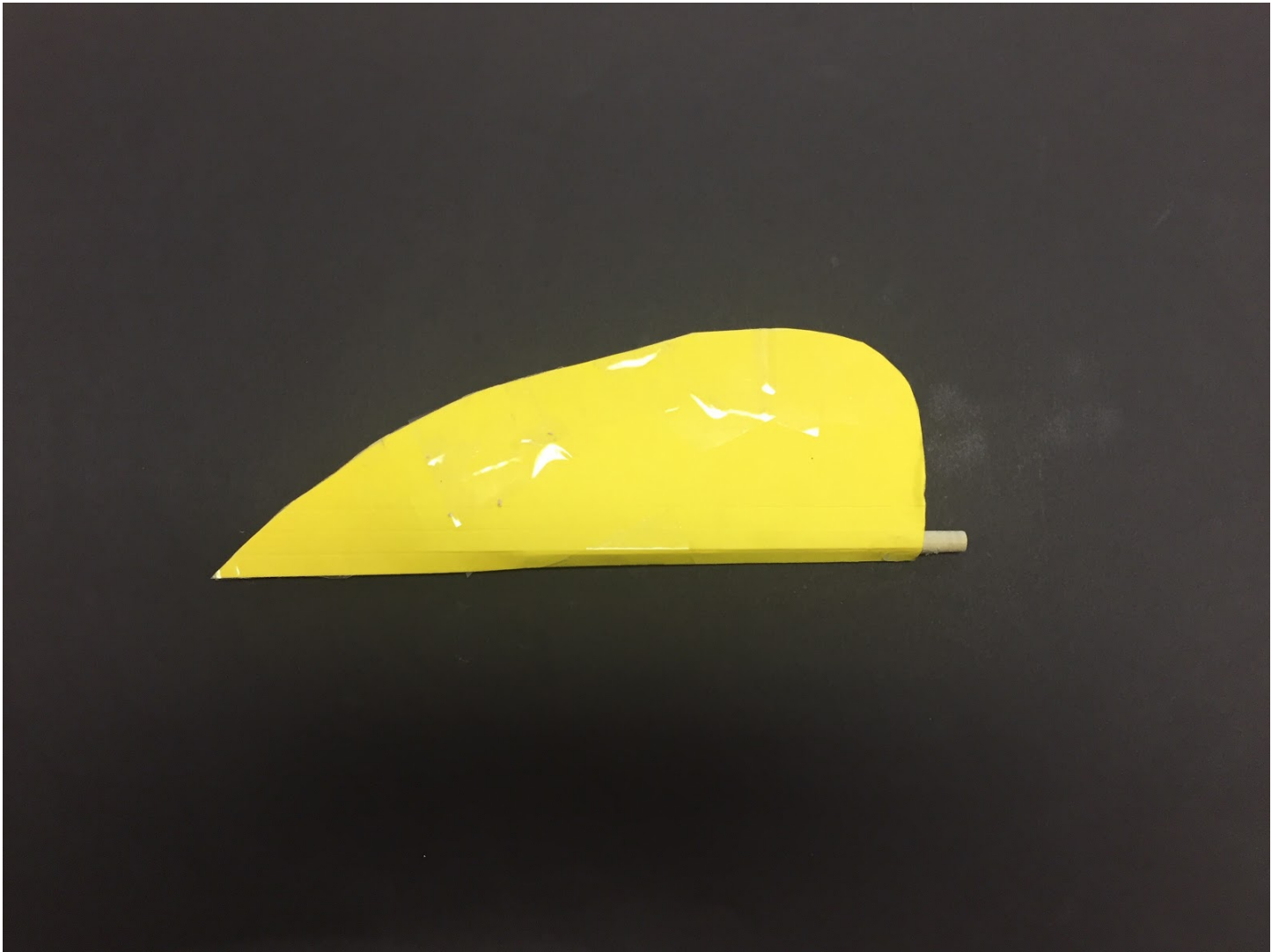
We are Caleb, Ben, and Henry. We are in 7th grade. We go to Ravenscroft. We are taking Middle School Engineering I. Making wind turbines is important because it could be our future power source.

### **Research Statement**

The process was to create blade design, then test and repeat. Some constant variables during our testing were the fan speed, 3, the highest speed, and distance between the fan and the turbine. We kept the variables the same because they would optimize the results. We changed the resistance, to optimize the net power, and distance from the end of the blade to the hub.

## Airfoil

The **Airfoil** blade design is a curved claw-like shape that has an air pocket in the middle of the blade. The blade's design was inspired by plane wings. The **Airfoil** design is made from file folder paper, glue, tape, and a dowel. The design is 8.4 inches long. We had high hopes for this design but overall it did compare well to other designs.



Data:

Trial	1	2	3	4	5
Number of blades	3	3	3	3	3
Blade Pitch (°)	10°	-10°	-30°	-20°	-35°
Resistance (Ω)	90 Ω	290 Ω	85 Ω	100 Ω	70 Ω
Mean power (mW)	49.35	489.4	673.4	496.5	645.3
Mean potential (V)	2.74	12.04(V)	7.546	7.147	8.038

## Whole wheat

The **Whole wheat** design is a square and triangle like shape that is open in the middle. The materials used were cereal boxes, glue, and a wooden dowel. The length of the blade is 27cm. The expectations for this blade were high and the blades result was really good.



Data:

Trial	1	2	3	4
Number of blades	2	2	2	2
Blade Pitch (°)	-5°	-30°	-20°	-30°
Resistance ( $\Omega$ )	130 $\Omega$	85 $\Omega$	100 $\Omega$	90 $\Omega$
Mean power (mW)	10.08(mW)	88.17(mW)	76.65(mW)	75.85(mW)
Mean potential (V)	1.146(V)	2.785(V)	2.785(V)	2.625(V)

# Hybrid Turbine

The Hybrid Turbine has four blades, 2 are blade design 1 and the other 2 blades are blade design 2.



Data:

Trial	1	2	3
Number of blades	4	4	4
Blade Pitch (°)	30°	-30°	-10°
Resistance ( $\Omega$ )	80 $\Omega$	90 $\Omega$	80 $\Omega$
Mean power (mW)	238.4(mW)	49.68(mW)	55.22(mW)
Mean potential (V)	4.465(V)	2.129(V)	6.8854(V)