MATERIALS PAGE

You will only have access to the following materials.

1) Go through the bolded words and circle if it is a changing variable and underline if it is a control. Example Control: Blade Material, Example Changing Variable: (Blade Number)
2) For variables that are controls, select 1 underlined value. When a variable is a control you will only have access to the underlined values.
3) For the variable that is the changing variable, select 4 values and write the trial letter (A, B, C, D) next to each value. Example ☒ Cardstock (original) A

General Materials:

☐ Wind turbine base ☐ Measuring tape ☐ Wind turbine protractor

☐ Multimeter ☐ Binder Clips

Blade Material:

☐ Kleenex ☐ Paper ☐ Paper towel

☐ Styrofoam ☐ Metal ☐ Cardstock (original)

Blade Number:

☐ 1 ☐ 2 ☐ 3(original) ☐ 4 ☐ 5 ☐ 6

Weight Number:

☐ 0 ☐ 3 (original) ☐ 6 ☐ 9 ☐ 12 ☐ 15

☐ 18 ☐ 21 ☐ 24

Weight Placement:

☐ 0 cm ☐ 1 cm ☐ 2 cm ☐ 3 cm ☐ 4 cm ☐ 5 cm

☐ 6 cm(original) ☐ 7 cm ☐ 8 cm ☐ 9 cm ☐ 10 cm ☐ 11 cm

****Note:** if you are changing Number of Weights, you may only place your weights at **6 cm**.

Dowel Placement:

☐ 0.5 cm ☐ 1 cm ☐ 1.5 cm ☐ 2 cm ☐ 2.5 cm ☐ 3 cm(original)

☐ 3.5 cm ☐ 4 cm ☐ 4.5 cm ☐ 5 cm ☐ 5.5 cm ☐6 cm

Blade Angle:

☐ 0°/180° ☐ 10° ☐ 20° ☐ 30° ☐ 40°(original) ☐ 50°

☐ 60° ☐ 70° ☐ 110°/-70° ☐ 120°/-60° ☐ 130°/-50° ☐ 140°/-40°

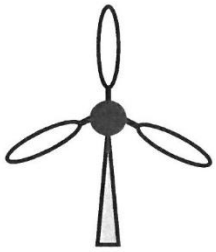
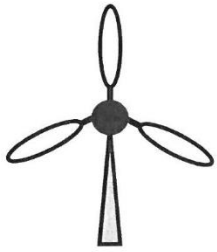
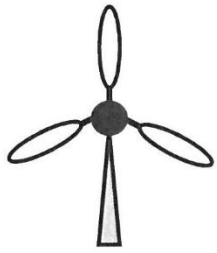
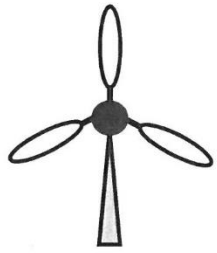
☐ 150°/-30° ☐ 160°/-20° ☐ 170°/-10°

Fan Distance: _____

Any distance between 20 cm – 100 cm (original fan distance = 60 cm)

EXPERIMENTAL SET-UP

Determine the values of your changing variable (ex: number of blades) from the materials page and write the values (ex: 4) for your four trials under each wind turbine.

	Trial A	Trial B	Trial C	Trial D
				
Changing Variable:				
_____ :	_____	_____	_____	_____

Controls (variables you will hold constant)**:**
Determine the variables that you will hold constant and indicate the specific value you will use in all your trials. (Control/Value)

_____ / _____

_____ / _____

_____ / _____

_____ / _____

_____ / _____

_____ / _____

_____ / _____

_____ / _____

SciTrek Member Approval_____

RESULTS

Table

Fill out the chart for each of your trials. For the variables that remain constant, write the value in trial A and then draw an arrow through each box indicating that this variable is a control.

Underline controls, circle changing variables, and box information about data collection.

Variables		Trial A	Trial B	Trial C	Trial D
Blade Material:		Paper	Kleenex	Metal	Styrofoam
Blade Number:		3 →	→	→	→
Weight Number:		3 →	→	→	→
Weight Placement:		6 cm →	→	→	→
Dowel Placement:		1.5 cm →	→	→	→
Blade Angle: (list both the actual angle and what angle you will find on the wind turbine protractor)		30° →	→	→	→
Fan Distance:		50 cm →	→	→	→
Fan Speed (Other Variable)		3 (high) →	→	→	→
Predictions		**Trial A**	**Trial B**	**Trial C**	**Trial D**
Put an "M" in the trial that will give the most current and an "L" in the trial that will give the least current.					
Data		**Trial A**	**Trial B**	**Trial C**	**Trial D**
Final Measurements/ Observations:	Current:	0.3 mA	0.0 mA	2.0 mA	1.9 mA
	Other:	Blades bent	Blades ripped	Blades did not bend	Blades did not bend

The independent variable is the changing variable and the dependent variables are the final measurements/observations.

NOTES ON PRESENTATIONS

What variables affect the color of the solution?

Subgroup 1

Changing Variable:				
Color of the Solution:				

Summary: _____

_____

Subgroup 2

Changing Variable:				
Color of the Solution:				

Summary: _____

_____

Subgroup 3

Changing Variable:				
Color of the Solution:				

Summary: _____

_____

Subgroup 4

Changing Variable:				
Color of the Solution:				

Summary: _____

_____

Subgroup 5

Changing Variable:				
Color of the Solution:				

Summary:_____

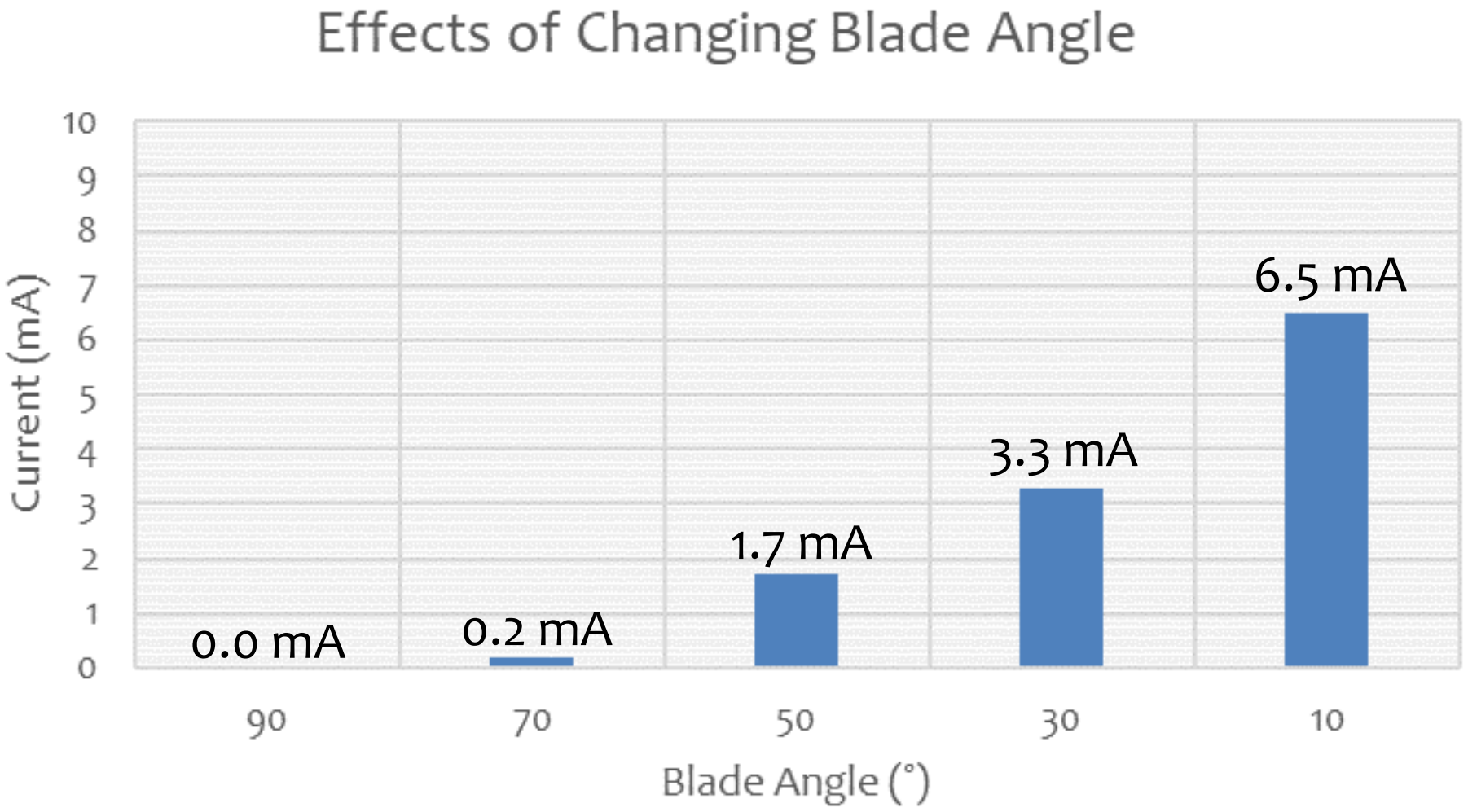
_____

Subgroup 6

Changing Variable:				
Color of the Solution:				

Summary:_____

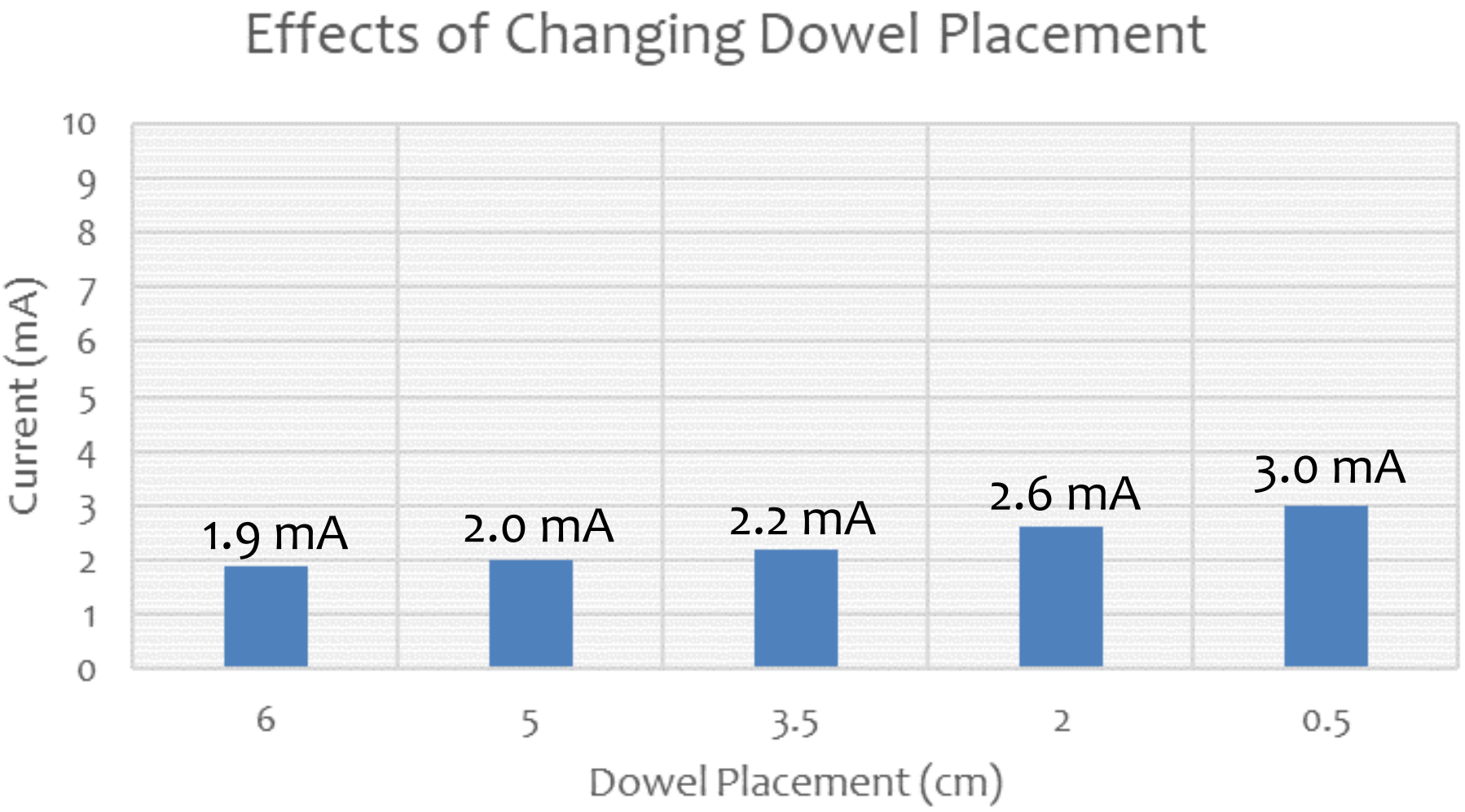
_____



Controls:

Dowel Placement / 1 cm

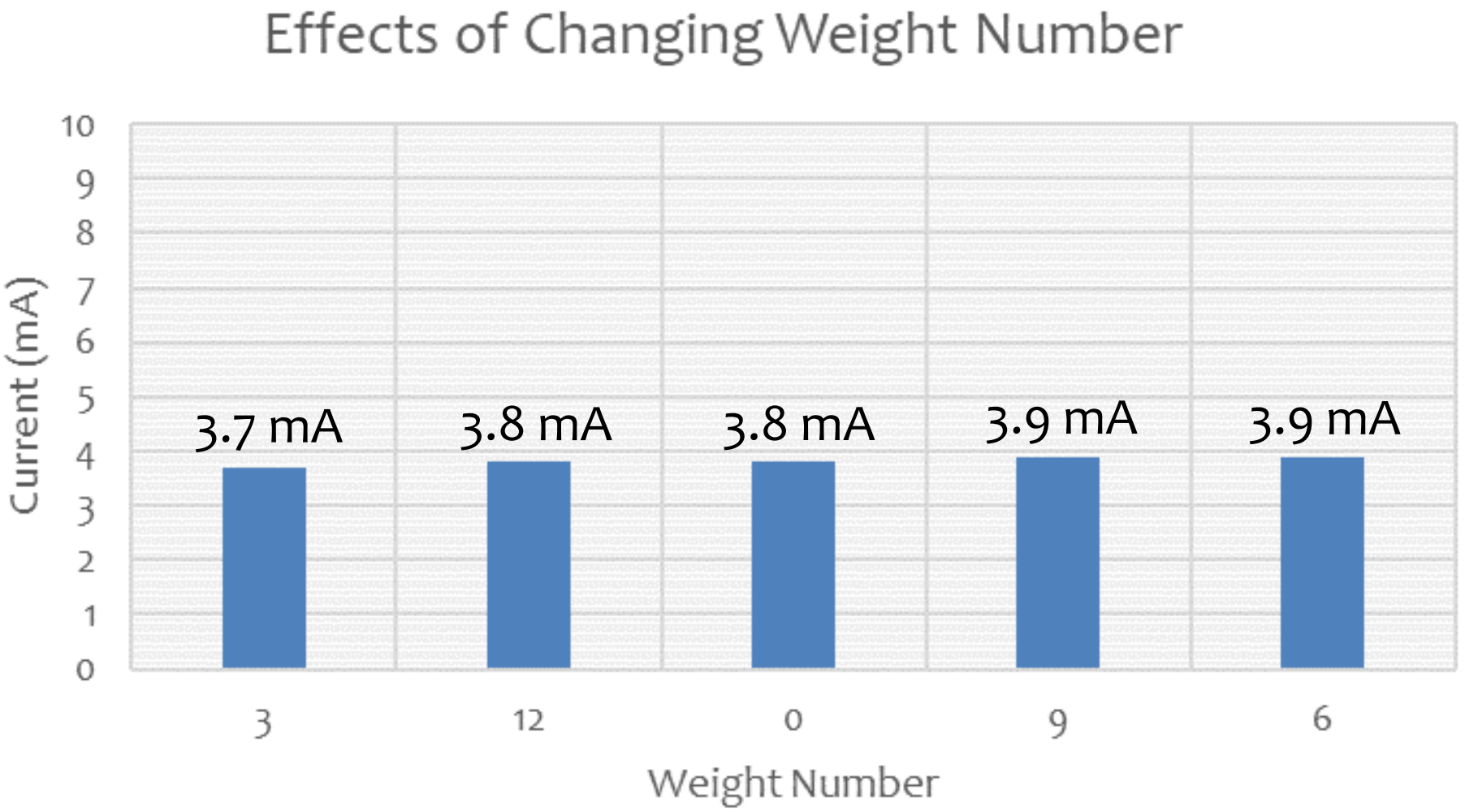
Weight Number / 3



Controls:

Blade Angle / 40°

Weight Number / 3



Controls:

Blade Angle / 40°

Dowel Placement / 1 cm