

Ping Pong Ball Anemometer

Objective: To find the relationship between wind speed and the angle measured on a ping-pong ball anemometer.

Materials:

- 2 Protractors
- String
- Straws
- Ping-pong ball
- Fan
- Digital Anemometer

Investigative Question: How does the angle of the ping-pong ball anemometer change as the speed of the wind changes.

Hypothesis:

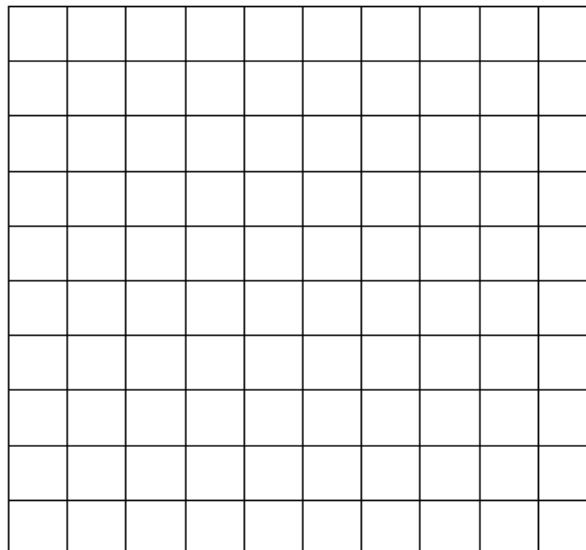
Justification/Explanation



Data:

Wind Speed (mph)	Angle of Ping-Pong Ball (°)

Create a Scatter Plot of Power vs. Angle below:



Analysis:

- 1) Draw a line of best fit.
- 2) Find the y -intercept. _____
- 3) Pick two points on the line. $_(_,_)_(_,_)_$
- 4) Find the rise. _____
- 5) Find the run. _____
- 6) Find the slope. _____
- 7) Write the equation of the line. _____

If the wind is blowing at 5 mph, how what will be the reading on the ping-pong ball anemometer? (Use your equation.) _____

If the wind creates a reading of 17° on the ping-pong ball anemometer, how fast is it blowing? (Use your graph.) _____

What does your y -intercept mean? _____

What does your slope mean? _____

Who would care about wind speed? _____

Why would they care about wind speed? _____

What is the angle on the ping-pong ball anemometer outside today? _____

What is the wind speed outside today? _____

Extension:

To find wind speed easily and accurately, without using the graph, create an equation that uses angle read on the ping-pong ball anemometer as the input and wind speed as the output.

- 1) Write the equation you created from the slope and y -intercept.
- 2) Solve for the independent variable.

If the wind creates a reading of 17° on the ping-pong ball anemometer, how fast is it blowing? (Use your new equation.) _____

What wind speed will it take to get an angle of 90° ? _____

Which equation did you use, new or old?

How could you have used the other one? _____

If the wind speed is 38 mph, what will the reading be on the ping-pong ball anemometer? _____

What do you know about the result? _____