Angle Sensor Investigation

Scientists look at the world and record what they see. Observations can be recorded in pictures as well as numbers.

Often measurements can be made by machines using sensors. There are many reasons why machines measure things better than people.

Many sensors are surprisingly simple to make.

We will see if a volume control dial (a variable resistor…a 'pot' or **potentiometer)** could be used to detect or sense wind direction.

Rotating the dial affects how easily electricity flows through the pot

Your challenge…

- Can an inexpensive potentiometer be tricked into becoming a wind direction sensor?

- Could this idea be used to programme a computer chip to turn a robot's head to a certain position?

Extra info…

- A potentiometer provides resistance to the flow of electricity.

- Resistance is measured in ohms.

- 1,000 ohm = 1 kilo ohm   (1k ohm)

1. **Build** an angle sensor.

2. **Test** your sensor. Measure the resistance reading using the 20k setting on the meter.

3. **Use** your sensor. Draw a table to record results. Take readings of resistance every ten degrees starting from 0 degrees up to 90 degrees.

4. Draw a graph of resistance reading (y axis) compared to the angle in degrees (x axis).

5. Use your graph to predict the resistance reading when the wind blows from an angle of 120 degrees and 145 degrees.

6. Write a conclusion…answer the questions in the challenge!

For teachers:

1) What mathematical thinking should be explored by students BEFORE attempting this activity?

2) Which of the curriculum aims and objectives could be covered in this activity? (eg, Number & Algebra)

3) Which skills and numerical thinking could be demonstrated by students? (eg, units of measurement? SI units?)

4) What mathematical thinking should be explored by students AFTER attempting this activity?

5) How does this $10 meter support doing maths at home or in the community?

6) How does this $10 meter support doing cross-curricula learning (beating the 'crowded curriculum')?