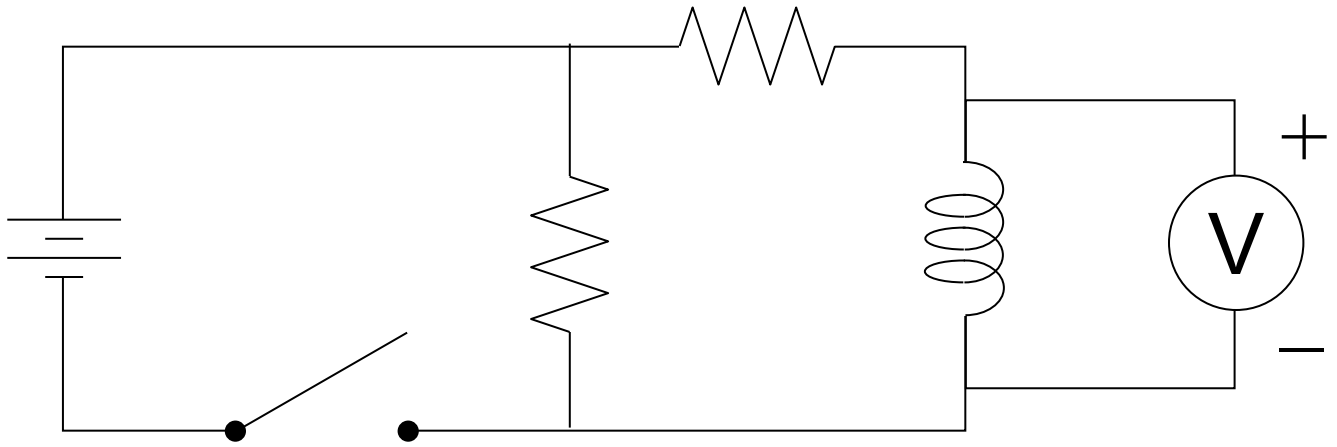
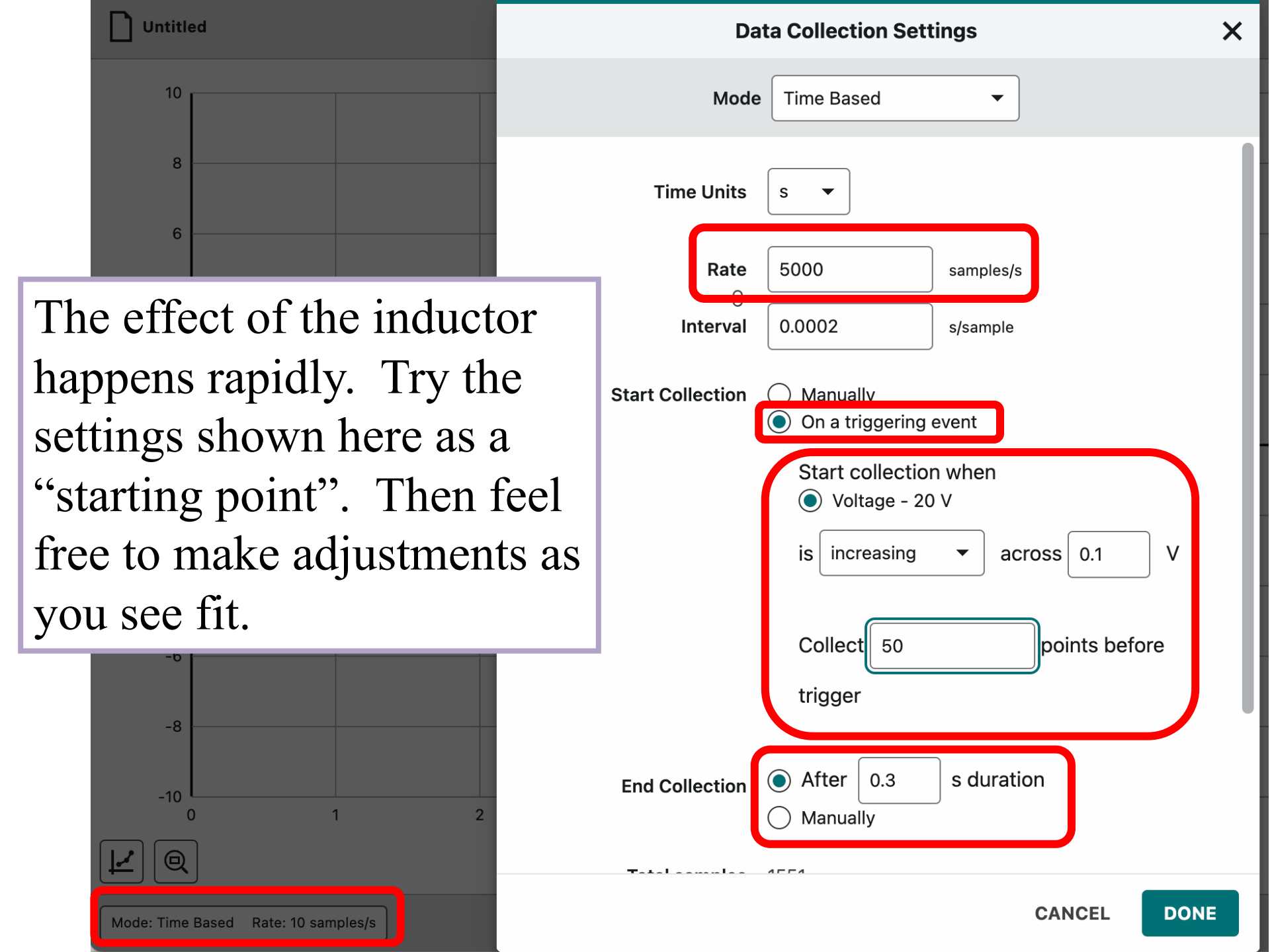
Inductor Mini-Lab

Vernier Board2 and GoDirect

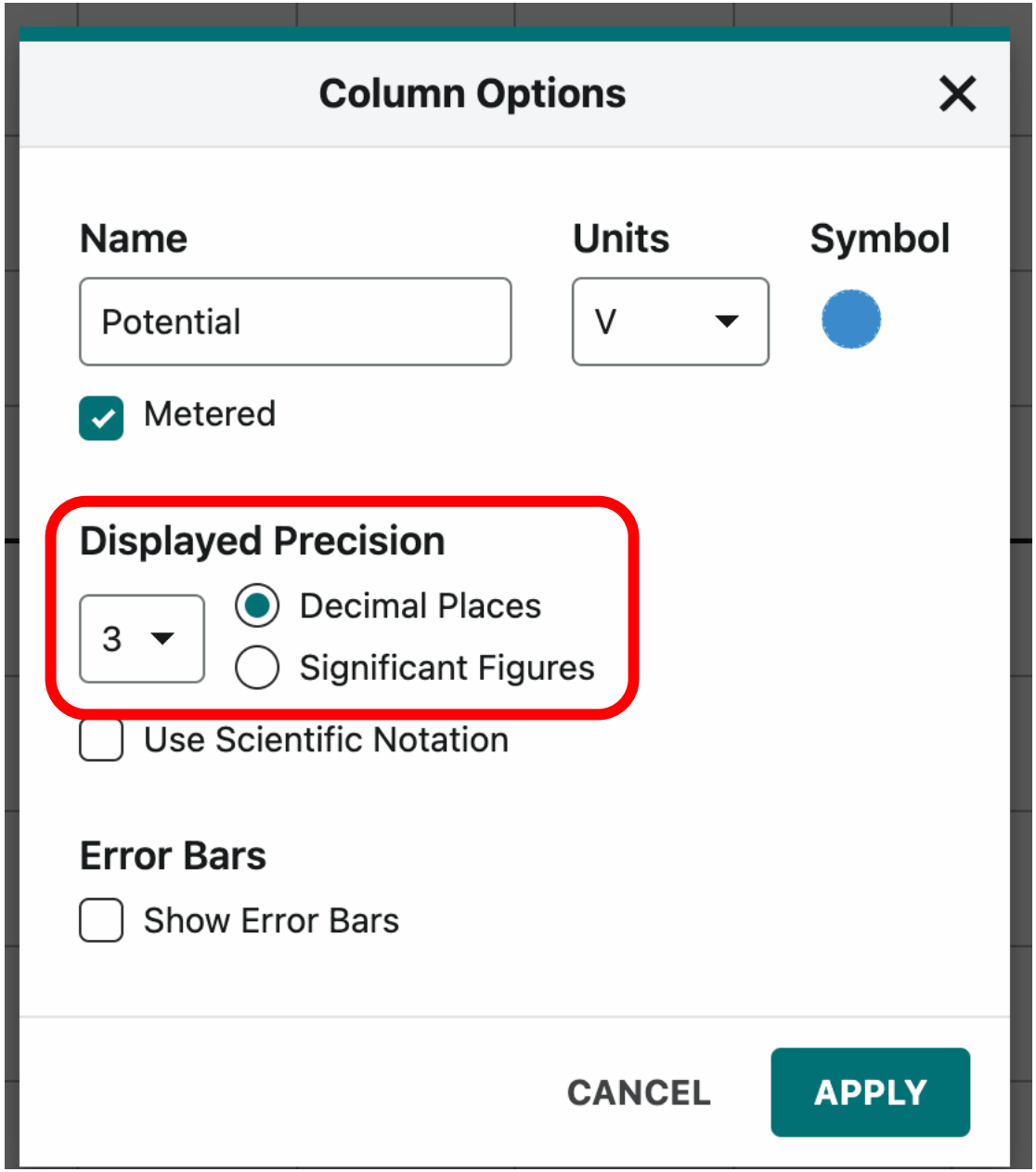
- Challenge: determine the inductance of the coil using experimental data. Is the value 5 mH with the iron core or without the iron core?
- Rules of the game: Use only the voltage probe and the Vernier circuit kit. Save your data and results so that you can share with the class.
- Evidence for inductance can be observed when current is initiated in the coil and also when the current in the coil ceases. Try observing both phenomena.

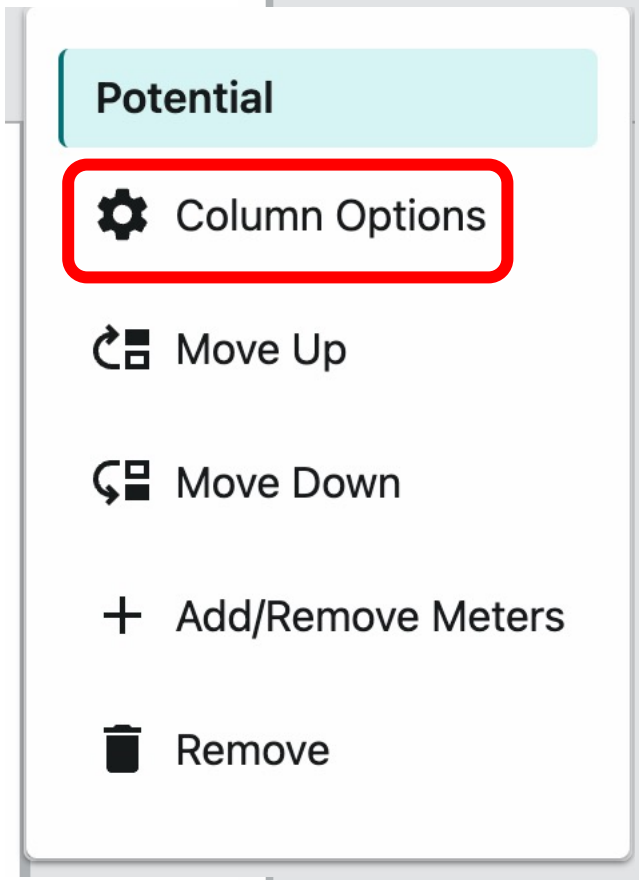
Try collecting data with a circuit similar to this. The two resistors shown can be anything you want. Note: the inductor coil itself has resistance – therefore, the coil **alone** acts as an inductor *and* a resistor.

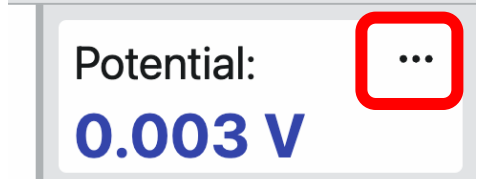




The effect of the inductor happens rapidly. Try the settings shown here as a "starting point". Then feel free to make adjustments as you see fit.


Column Options
Name
Potential
Units
V
Symbol
Metered
Displayed Precision
3
Decimal Places
Significant Figures
Use Scientific Notation
Error Bars
Show Error Bars
CANCEL
APPLY


Potential
Column Options
Move Up
Move Down
Add/Remove Meters
Remove


Potential:
0.003 V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- It is helpful to determine the resistance of the coil. One way to do this is to run a separate experiment using the other known resistances on the board. (Did anyone say "voltage divider"?)
- It will be difficult to use the formula $\mathcal{E} = -L\frac{dI}{dt}$ to determine the inductance L. It is probably best to incorporate the time constant in order to get an experimental value.