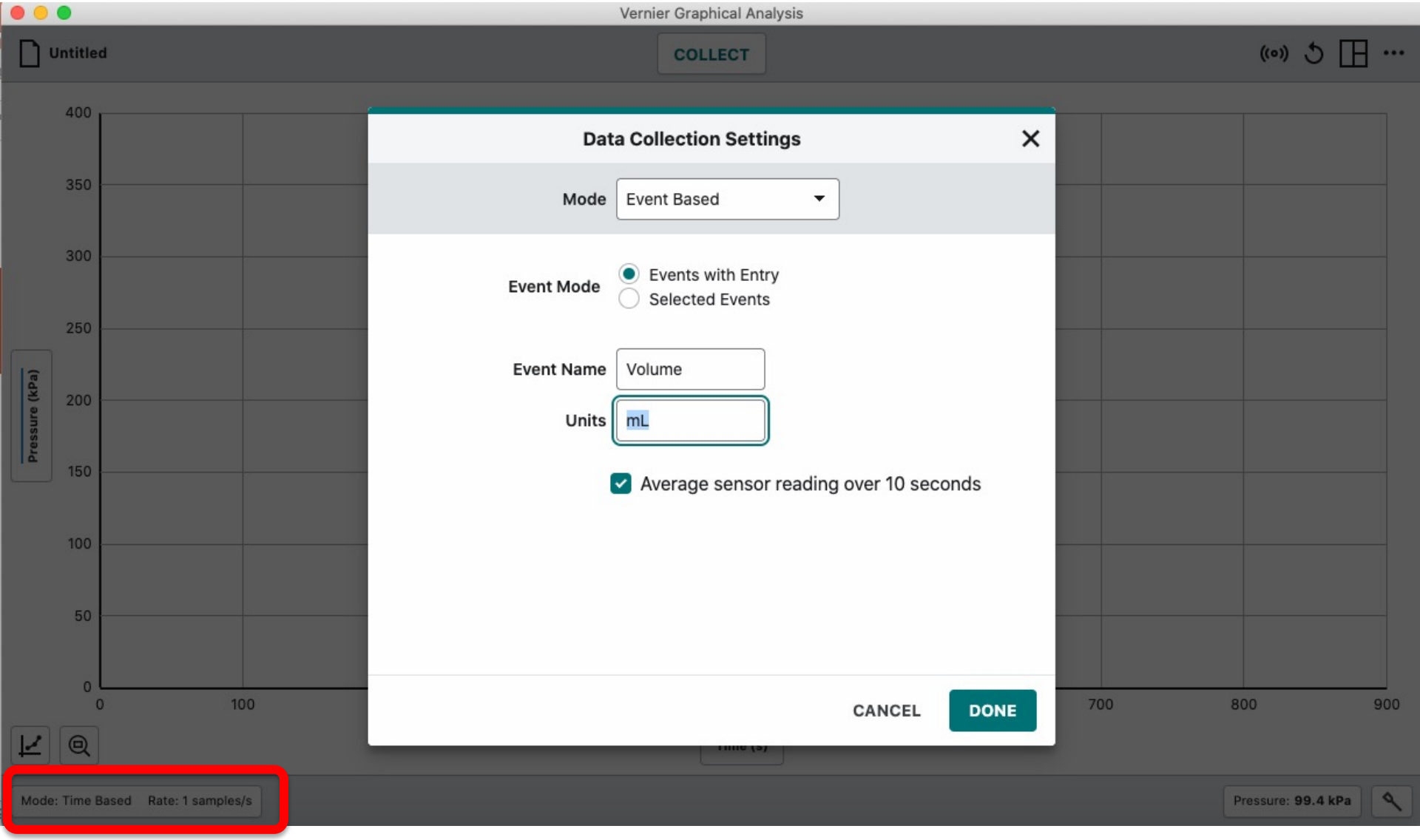
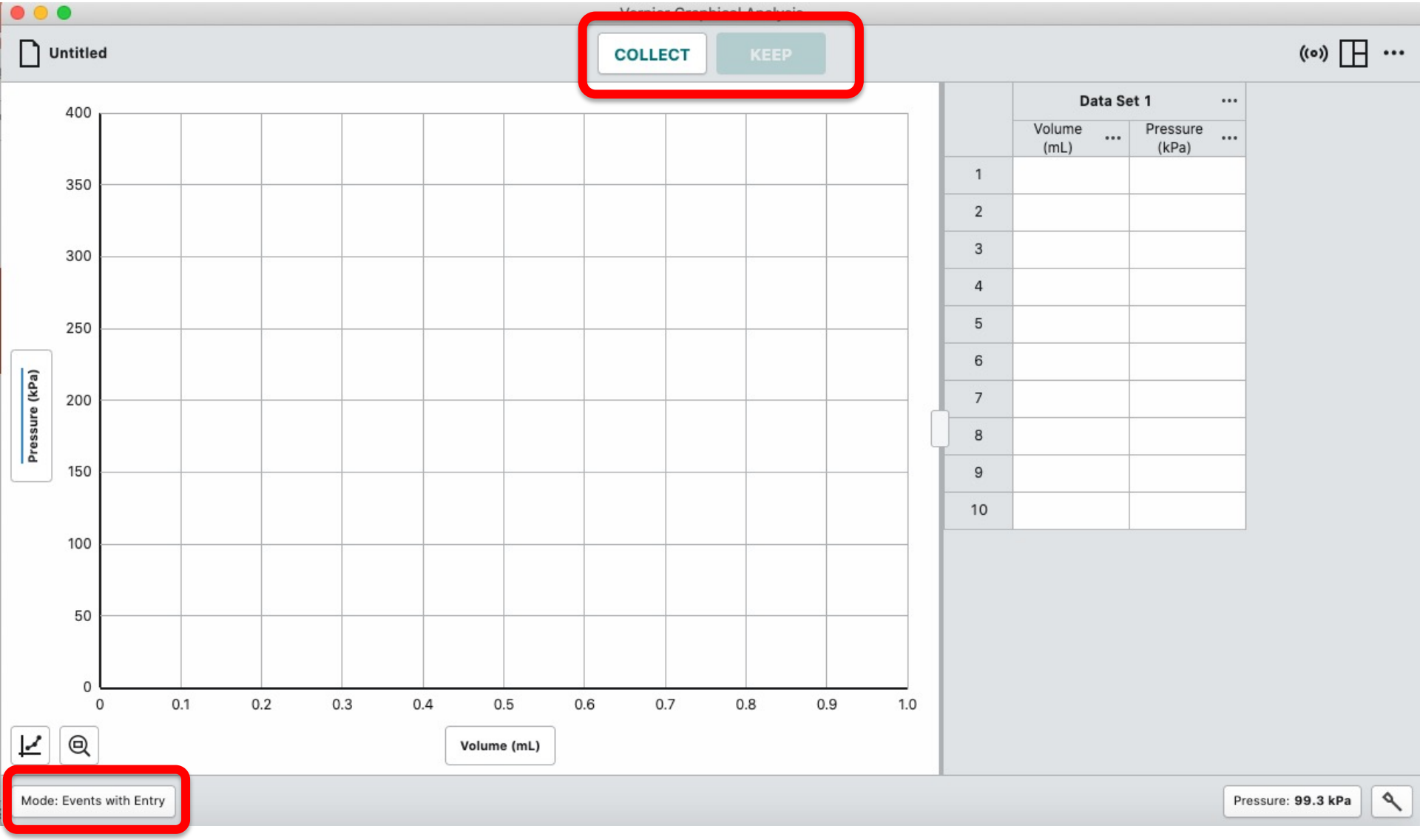
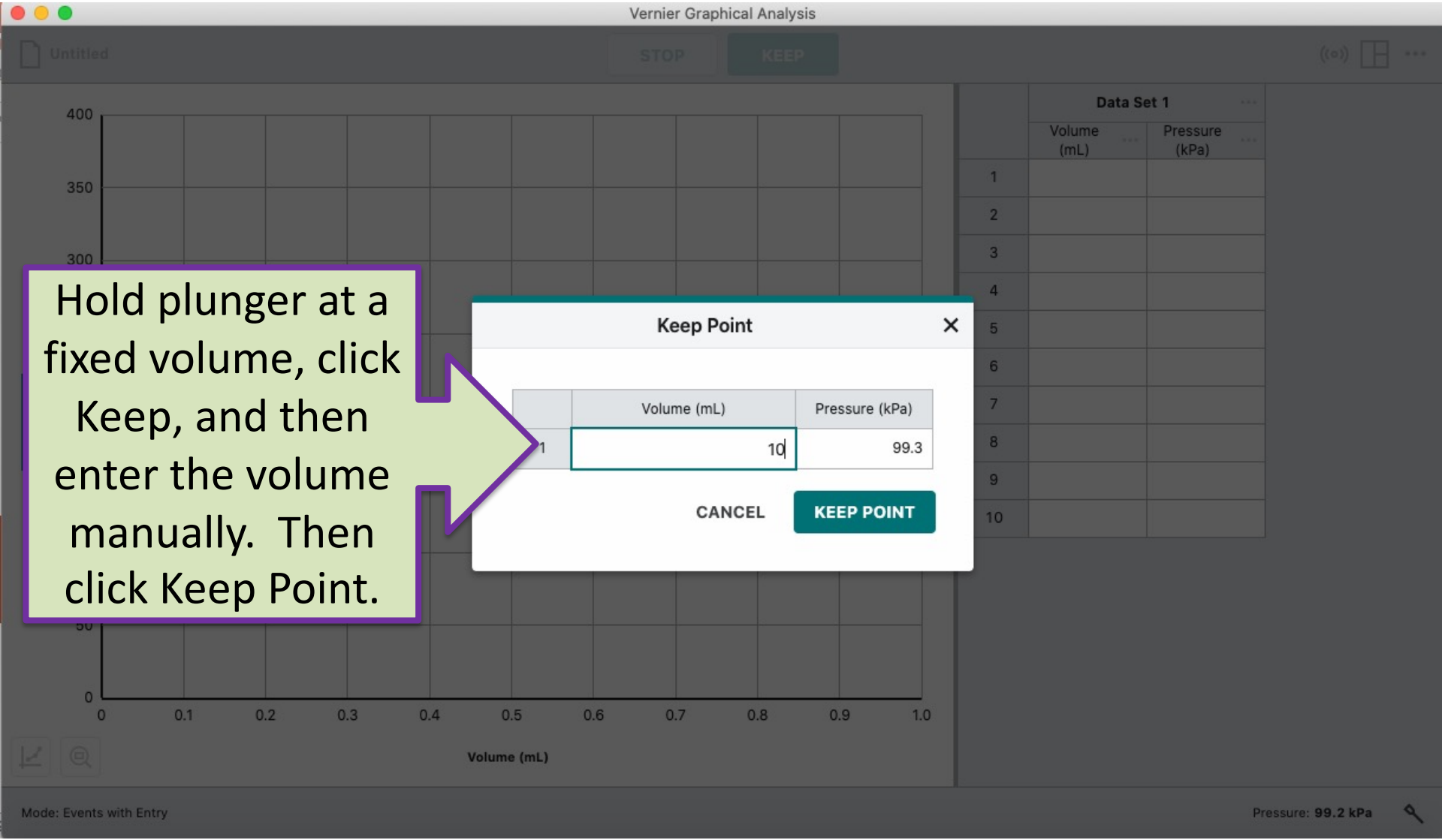
Mini-Lab: $PV = NkT$

1. Connect GoDirect Pressure to Graphical Analysis on laptop. Move the plunger to 10 mL and then attach to the sensor by screwing it on snuggly (not too tight!)
2. Under Data Collection Settings, choose Events with Entry with name Volume and units mL.
3. Click Collect and then Keep to record the current pressure. Enter the volume manually. Repeat the process to collect data for fixed volumes of 6, 8, 10, 12, 14, 16, 18, 20 mL.
4. Create a graph of Pressure vs. Volume. Determine the best fit. Use $PV = NkT$ to solve for the number of molecules in the syringe! Or, use 22.4 L to determine k.
5. Challenge analyze the same data with a linear graph.


Vernier Graphical Analysis
Untitled
COLLECT
Data Collection Settings
Mode
Event Based
Event Mode
Events with Entry
Selected Events
Event Name
Volume
Units
mL
Average sensor reading over 10 seconds
CANCEL
DONE
Pressure (kPa)
400
350
300
250
200
150
100
50
0
0
100
700
800
900
Mode: Time Based Rate: 1 samples/s
Pressure: 99.4 kPa


Untitled
COLLECT
KEEP
Data Set 1
Volume (mL)
Pressure (kPa)
1
2
3
4
5
6
7
8
9
10
400
350
300
250
200
150
100
50
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Pressure (kPa)
Volume (mL)
Mode: Events with Entry
Pressure: 99.3 kPa


Vernier Graphical Analysis
Untitled
STOP
KEEP
400
350
300
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Volume (mL)
Data Set 1
Volume (mL)
Pressure (kPa)
1
2
3
4
5
6
7
8
9
10
Hold plunger at a fixed volume, click Keep, and then enter the volume manually. Then click Keep Point.
Keep Point
Volume (mL)
Pressure (kPa)
1
10
99.3
CANCEL
KEEP POINT
Mode: Events with Entry
Pressure: 99.2 kPa