



## monitoring breathing

- fit **respiration belt**.
- attach **gas pressure sensor** to the connector.
- APPS → ChemBio.

```
VERNIER SOFTWARE
BIOLOGY AND
CHEMISTRY
WITH THE CBL

8/11/00 [ENTER]
```

```
***MAIN MENU***
1:SET UP PROBES
2:COLLECT DATA
3:VIEW GRAPH
4:VIEW DATA
5:FIT CURVE
6:RETRIEVE DATA
7:QUIT
```

```
ENTER NUMBER OF
PROBES:1
```

```
SELECT PROBE
1:TEMPERATURE
2:PH
3:PRESSURE
4:COLORIMETER
5:VOLTAGE
6:CONDUCTIVITY
7:MORE PROBES
```

```
SELECT PROBE
1:O2 OXYGEN
2:BAROMETER
3:LIGHT
4:REL HUMID
5:BIO PRESSURE
6:HEART RATE
7:MORE PROBES
```

```
SELECT PROBE
1:VERNR STD TEMP
2:LONG TEMP
3:THERMOCOUPLE
4:RESPIR. BELT
5:EKG
6:CO2 SENSOR
7:MORE PROBES
```

```
USE LOWEST
AVAILABLE
CHANNELS.

ENTER CHANNEL
NUMBER:1
```

```
***CHOOSE COURSE***
1:USE STORED
2:PERFORM NEW
3:MANUAL ENTRY
```

```
***MAIN MENU***
1:SET UP PROBES
2:COLLECT DATA
3:VIEW GRAPH
4:VIEW DATA
5:FIT CURVE
6:RETRIEVE DATA
7:QUIT
```

```
DATA COLLECTION
1:MONITOR INPUT
2:TIME GRAPH
3:TRIGGER/PROMPT
4:TRIGGER
5:SINGLE POINT
6:RETURN
```

*to get pressure values  
for Y min and Y max.*

```

*****
1:MONITOR INPUT
2:TIME GRAPH
3:TRIGGER/PROMPT
4:TRIGGER
5:SINGLE POINT
6:RETURN

```

```

ENTER TIME
BETWEEN SAMPLES
IN SECONDS=.5

ENTER NUMBER
OF SAMPLES=360

```

*for example.*

```

SAMPLE
TIME .500 S
SAMPLES 360
EXPERIMENT
LENGTH 180.00 S
[ENTER]

```

```

*****
1:USE TIME SETUP
2:MODIFY SETUP

```

```

SET Y-AXIS
Ymin=?1005
Ymax=?1025
Yscl=?5

```

*for example.*  
 (use Y min and Y max data  
 from **Monitor Input**.  
 Y scl gives the Y axis scale.)

```

PRESS [ENTER] TO
BEGIN COLLECTING
DATA.

```

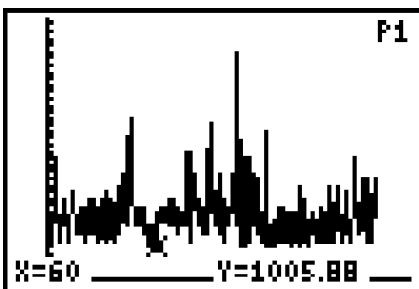
- When data collection has finished:-

```

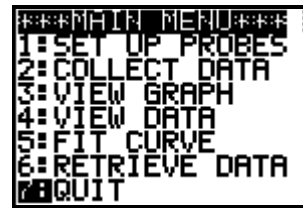
TIME IN L1
RESPIR.
IN L2

[ENTER]

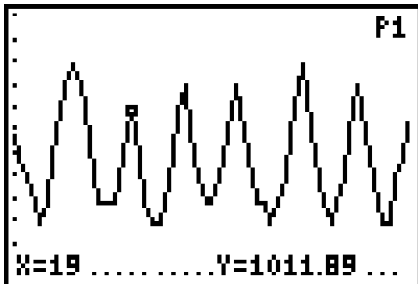
```



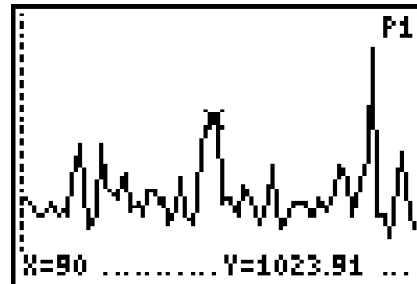
*example of unprocessed plot obtained.*



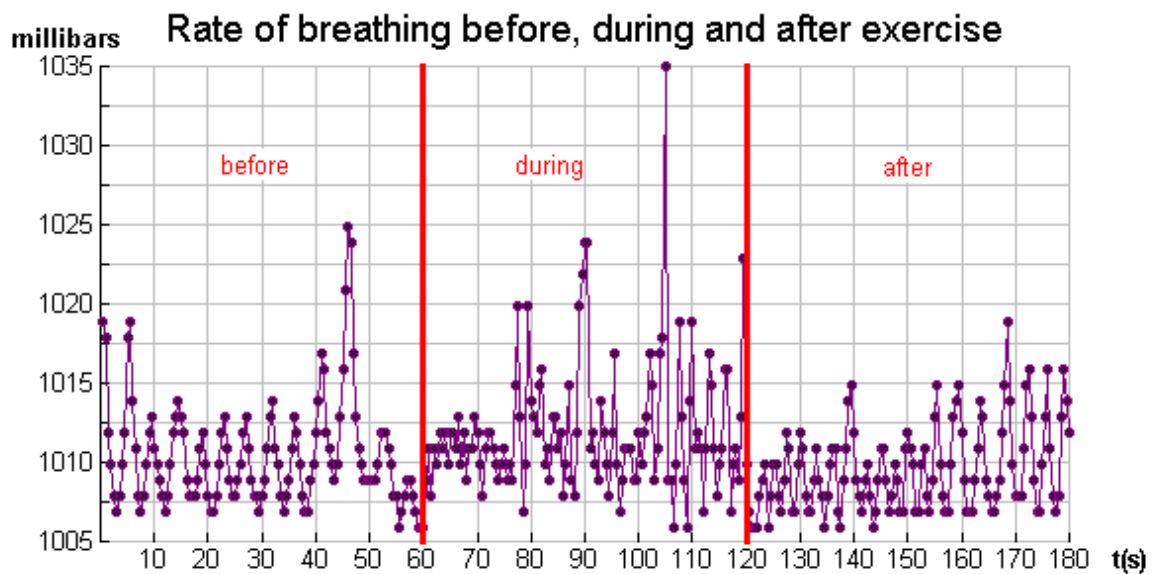
Using the ZOOM → ZBox tool, different calculator plots can be obtained. For example:-



Before exercise



During exercise



In this example, the data has been transferred to a spreadsheet (TI InterActive) and the graph produced within the sheet.