

Alternate CBL Instructions

Acceleration Due to Gravity

Safety Precautions



- Keep clear of falling masses.
- Use caution when plugging in, using, or unplugging the CBL 2 unit's power supply.

Materials

CBL 2 unit

TI graphing calculator

DataMate program

motion detector

ring stand

metal support rod

right-angle clamp

2–3 textbooks

meterstick

Procedure

1. Attach the metal support rod, oriented horizontally to the vertical ring stand using the right-angle clamp.
2. Secure the ring stand at the edge of the lab table by placing two textbooks on the base.
3. Attach the motion detector to the edge of the horizontal support rod so that the motion detector faces downward.
4. Plug the motion detector into the DIG/SONIC channel of the CBL 2 unit. Connect the CBL 2 unit to the calculator using a link cable. Press both ends of the link cable firmly into each unit.
5. Turn on the graphing calculator, and start the DataMate program. The CBL 2 unit should auto ID the motion detector and a default time interval of 5 s should be displayed. Press CLEAR to reset the application program.
6. From the Main screen select SETUP. Using the arrow keys, scroll to MODE and press ENTER.
7. From the SELECT MODE menu, select TIME GRAPH.
8. Select CHANGE TIME GRAPH SETTINGS from the TIME GRAPH menu.
9. Enter "0.1" as the time between samples (in seconds). Enter "100" as the number of samples so that the data collection will last 10 s. Select OK to return to the setup screen. Select OK once more to return to the Main screen.
10. Hold a book horizontal and 0.4 m (no closer) below the motion detector. Unlike a ball, the book will not bounce. Select START to begin data collection. When a

ticking sound is heard coming from the motion detector, drop the book. After the data collection stops, press ENTER to select DIG-DISTANCE.

11. Using the arrow keys, move the cursor from data point to data point and record the distance, rounding to the nearest 0.01, and time in your data table. When the graph becomes horizontal, the book has reached the floor.
12. Press ENTER, and then select MAIN SCREEN. Select QUIT to exit the DataMate program.

Alternate lab procedure, using a CBL unit

1. Attach the metal support rod, oriented horizontally to the vertical ring stand using the right-angle clamp.
2. Secure the ring stand at the edge of the lab table by placing two textbooks on the base.
3. Attach the motion detector to the edge of the horizontal support rod so that the motion detector faces downward.
4. Connect the motion detector to the SONIC port of the CBL unit. Connect the TI graphing calculator to the CBL unit with a link cable. Turn on the CBL unit and the graphing calculator.
5. On the graphing calculator start the PHYSICS program and go to the MAIN MENU.
6. Select SET UP PROBES from the MAIN MENU. Select ONE as the number of probes.
7. From the SELECT PROBE MENU, select MOTION. You will return to the MAIN MENU.
8. Select COLLECT DATA. Select TIME GRAPH from the DATA COLLECTION menu. Enter "0.1" as the time between samples (in seconds). Press ENTER. Enter "99" as the number of samples so the calculator will collect data for about 10 s. Press ENTER twice and then select USE TIME SETUP to continue. Select NON-LIVE DISPLAY.
9. Hold a book horizontal and 0.4 m (no closer) below the motion detector. Unlike a ball, the book will not bounce. Press ENTER to begin data collection. When a ticking sound is heard coming from the motion detector, drop the book.
10. When data collection is complete, press ENTER to continue to the SELECT GRAPH menu. Select DISTANCE.
11. Using the arrow keys, move the cursor from data point to data point and record the distance, rounding to the nearest 0.01, and time in your data table. When the graph becomes horizontal, the book has reached the floor.
12. Press ENTER, and then select NEXT. Select NO at the REPEAT? Prompt. Select QUIT to exit the PHYSICS program.