# Newton's g - ball


It is with great pleasure that we can present the g-ball. The ball contains a digital stopwatch that can display times between 0.01 to 29.99 seconds. Hold down the button and the time is reset. Timing starts when you release the__ ball and stops when it hits the floor.
The mechanism is well protected and the display is sharp but the display may fail. Therefore, the ball should be dropped onto a soft surface, such as a lawn. Remember that friction against the air will always affect experimental results.

*Functions*

1. Press the button (PUSH)- the time is reset.
2. Press the button again and hold it down.
3. Drop the ball - the time starts.
4. The ball hits the floor/ground - the time is stopped.

*Examples of experiments*

1. Determine the acceleration due to gravity.
2. How high is the house?
3. Throw the ball straight up. How high was the ball? What was the maximum speed?
4. Release the ball from a certain height.
   Repeat the experiment from the same height but now throw the ball sideways. NOTE: Not upwards! Result?

*Formulas and tables*

$$d = ut + at^2/2$$

$$a = g \approx 9.8\ ms^{-2} \qquad u = 0\ ms^{-1}$$

$$d = gt^2/2$$

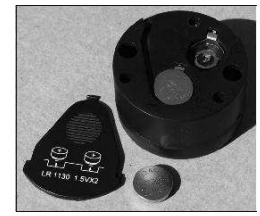
$$t = Sqrt(2d/g)$$

| d (m) | time (s) |
|---|---|
| 2 | 0,64 |
| 3 | 0,78 |
| 4 | 0,90 |
| 5 | 1,01 |
| 6 | 1,11 |
| 7 | 1,20 |
| 8 | 1,28 |
| 10 | 1,43 |

| time (s) | d (m) |
|---|---|
| 0,5 | 1,23 |
| 0,64 | 2,01 |
| 1.0 | 4,90 |
| 1,1 | 5,93 |
| 1,2 | 7,06 |
| 1,3 | 8,28 |
| 1,4 | 9,60 |
| 1,5 | 11,03 |

*Replacing the batteries*

1. Loosen the screws next to the display with a Phillips screwdriver.
2. Lift out the clock module, turn it over and slide the battery cover aside.
3. Replace batteries with two new ones. Turn the plus (+) side up!
4. Slide the battery cover back and reassemble the clock module.



Max vertical drop: About 12 metres depending on the landing surface.
Diameter: 10 cm.
Batteries: 2 x SR54 (LR = 1130).
Warranty: 1 year. No assurance can be given for faulty display.
NOTE! Never press on the display!
Not suitable for children under 36 months, contains small parts.

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