

Linear functions can be used to describe the action of springs that stretch,like those in telephone cords, and springs that compress, like those in a mattress or a bathroom scale. Hooke’s Law in science says that, for an ideal coil spring, the relationship between weight and length is perfectly linear, within the elastic range of the spring. The table below shows data from an experiment to test Hooke’s Law on differen coil springs.

HOOKE’S LAW

**Spring 3**

**Spring 2**

**Spring 1**

|  |  |
| --- | --- |
| **Weight**  (ounces) | **Length**  (inches) |
| 0 | 12 |
| 4 | 14 |
| 8 | 16 |
| 12 | 18 |
| 16 | 20 |

**Spring 4**

|  |  |
| --- | --- |
| **Weight**  (ounces) | **Length**  (inches) |
| 0 | 12 |
| 4 | 10 |
| 8 | 8 |
| 12 | 6 |
| 16 | 4 |

|  |  |
| --- | --- |
| **Weight**  (ounces) | **Length**  (inches) |
| 0 | 5 |
| 2 | 7 |
| 4 | 9 |
| 6 | 11 |
| 8 | 13 |

|  |  |
| --- | --- |
| **Weight**  (ounces) | **Length**  (inches) |
| 0 | 18 |
| 3 | 15 |
| 6 | 12 |
| 9 | 9 |
| 6 | 6 |

**For each spring:**

a) Identify the length of the spring with no weight applied.

b) Describe the rate of change of the length of the spring as weight is increased.

Indicate units.

c) Write a rule using NOW and NEXT to show how the spring length changes

with each additon of one ounce of weight.

d) Write the function rule (that gives the length *l* in inches when a weight of *w*

is applied) that would match the table of data and the NOW/NEXT

rule you wrote for part c.

e) Describe whether the experiment was designed to measure spring stretch

or spring compression. Explain how you can tell by looking at the table, and

rule.

f) Graph each spring below that shows *l* as a function of *w*.

Spring 1 in Red

Spring 2 in Blue

Spring 3 in Green

Spring 4 in Black



[](http://www.google.com/imgres?hl=en&biw=1366&bih=646&tbm=isch&tbnid=Yu4t9onTiwZMzM:&imgrefurl=http://www.greenlightsrecycling.com/GLRrecyclingnews.html&docid=9pPKEtzq_xEeeM&imgurl=http://www.greenlightsrecycling.com/mattress%20d.jpg&w=420&h=300&ei=Q8nLT4HbIIKY8gTGsoiWDw&zoom=1&iact=hc&vpx=706&vpy=149&dur=391&hovh=190&hovw=266&tx=141&ty=117&sig=106287969056575406529&page=1&tbnh=134&tbnw=195&start=0&ndsp=19&ved=1t:429,r:3,s:0,i:78)