

## Raw Data Sheet

Student Name: Michael Liebel

Team members:

1.- \_\_\_\_\_ 2.- \_\_\_\_\_

3.- \_\_\_\_\_ 4.- \_\_\_\_\_

Instructor: Michael Liebel

## Spring Constant

Record the relaxed length  $l_0$  : 17 (cm)

Table 1: Rows top to bottom represent mass and length of the spring, respectively.

|        |           |           |           |           |            |
|--------|-----------|-----------|-----------|-----------|------------|
| m (g)  | <u>60</u> | <u>70</u> | <u>80</u> | <u>90</u> | <u>100</u> |
| l (cm) | <u>20</u> | <u>23</u> | <u>26</u> | <u>29</u> | <u>33</u>  |

total

## Kinematics

Record the frequency of the sparks : 20 (Hz)Record the equilibrium distance,  $r_0$  : 10.9 (cm)Record the Puck's mass,  $m_p$  : 0.556 (kg)

Table 1.- Raw data: point's index along each track;  $r$  is the distance between the paths, measured between points with the same index;  $x$  is the distance between mass center points.  $\Delta a$  and  $\Delta b$  are the distances between every third point along each track;  
**Note: time = index/spark frequency**

| Raw data |             |             |                    |                    | Data Analysis |                     |                |                |                               |                               |                                        |                                     |            |
|----------|-------------|-------------|--------------------|--------------------|---------------|---------------------|----------------|----------------|-------------------------------|-------------------------------|----------------------------------------|-------------------------------------|------------|
| Index    | $r$<br>(cm) | $x$<br>(cm) | $\Delta a$<br>(cm) | $\Delta b$<br>(cm) | time<br>(s)   | $v_{C.M.}$<br>(m/s) | $v_a$<br>(m/s) | $v_b$<br>(m/s) | $\frac{1}{2}m_p v_a^2$<br>(J) | $\frac{1}{2}m_p v_b^2$<br>(J) | $\frac{1}{2}m_p(v_a^2 + v_b^2)$<br>(J) | $\frac{1}{2}(r - r_0)^2 k_s$<br>(J) | $E$<br>(J) |
| 0        | 14.4        | NA          | NA                 | NA                 |               |                     |                |                |                               |                               |                                        |                                     |            |
| 3        | 19.1        | 0.7         | 4.6                | 3.9                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 6        | 19.2        | 0.7         | 5.0                | 3.8                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 9        | 19.1        | 0.8         | 5.1                | 3.5                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 12       | 19.1        | 0.9         | 4.9                | 3.6                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 15       | 18.8        | 0.8         | 4.6                | 3.8                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 18       | 17.9        | 0.8         | 4.1                | 4.3                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 21       | 16.9        | 0.8         | 3.6                | 4.4                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 24       | 16.3        | 0.8         | 3.5                | 4.9                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 27       | 16.3        | 1.0         | 2.7                | 4.9                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 30       | 17.1        | 1.0         | 2.8                | 4.5                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 33       | 17.5        | 1.1         | 3.2                | 4.5                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 36       | 17.4        | 1.1         | 3.2                | 3.9                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 39       | 16.9        | 1.1         | 3.9                | 3.4                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 42       | 16.7        | 1.2         | 4.3                | 3.1                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 45       | 16.3        | 1.4         | 4.2                | 2.0                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 48       | 15.6        | 1.4         | 4.6                | 1.8                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 51       | 15.0        | 1.7         | 4.6                | 1.7                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 54       | 14.1        | 1.7         | 4.2                | 2.6                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 57       | 13.8        | 1.8         | 3.8                | 3.0                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 60       | 13.7        | 2.0         | 3.2                | 3.6                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 63       | 13.6        | 1.9         | 2.5                | 4.0                |               |                     |                |                |                               |                               |                                        |                                     |            |
| 66       | 13.7        | 1.9         | 1.8                | 4.2                |               |                     |                |                |                               |                               |                                        |                                     |            |

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