Student learning sheet

Mass and Spring

Name: _____Class: ____

Introduction:

Hooke's law is a law in physics that describes the relationship between the force needed to extend or compress a spring scales and distance. It is named after the British physicist Robert Hooke, who sought to demonstrate the relationship between forces applied to springs and their elasticity in the 17th century. This law still plays an important role in modern physics.

Activity 1. Weight and mass

Calculate the weights of the objects of masses:

$100 \text{ g} \rightarrow$	Ν
$200 \text{ g} \rightarrow$	Ν
$300 \text{ g} \rightarrow$	Ν
400 g →	Ν

To access the simulations with this <u>link</u> or scan QR code above.

Activity 2. Relationship between the extension of a spring and the applied force

- Select one spring

- Set up a suitable experimental system

- Your predictions: What is relationship between the extension of the spring and the applied force?

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- Conduct the experiment and complete the data table 1.

Table 1. Sample data set for activity 2

Weight colour	Red	Orange	Blue	Grey
Mass (g)				
Applied Force (N)				
Extension (cm)				



- Based on the data table, draw a graph to illustrate the relationship between extension of the spring (y-axis) and applied force (x-axis).

- Examine the plotted points on the graph paper. Which line shapes can you include from the graph? What is conclusion about the relationship between the extension of the spring and the applied force





Activity 2. Effect of spring strength on the extension of a spring and an applied force

- Set up an experiment to use the second spring.

- Your predictions: Is there any different effect of spring strength on the extension of the spring if the same force applied on?

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- Conduct an investigation and write the data you collected into Table 2.

Table 2. Data table for Experiment 2

Weight colour	Red	Orange	Blue	Grey
Mass (g)				
Applied Force (N)				
Extension (cm)				

- Draw plots to illustrate the relationship between extension of the spring and applied force for spring in the same graph with Experiment 1.

- Interpret the results and reach conclusions as follows:

+ Which are shape lines of the two plotted data?

+ Which spring has its spring strengths higher?

Fig. 2 Extension plotted against force applied of two different springs

