Name:

Date:

SBA:

Topic: Pressure

Title: Force and Pressure

Aim: To determine if pressure is dependent on surface area

Equations:

a. P = $\frac{F}{A}$ b. 1 kg = 2.2 lbs

c. 1 m2 = 104 cm2 d. 1 kg = 10 N

Apparatus/Materials: graph paper, pencil, foot

Method: (***Write this section in past tense. Refer to yourself as an experimenter or student. Do NOT use any pronouns, I, my, she, he, our etc.***)
1. Stand on a piece of graph paper and trace the area of your foot. (*If you foot is longer than the graph paper then use two pieces of graph paper and glue them together.*)

2. Count the number of squares your foot has covered.

3. Determine the area of one of the squares then calculate the area the foot has covered.

4. Stand on a scale and record your mass.

5. Place all data in an appropriate table.

Diagram: (***Place the graph paper with your traced foot in this section***)

Observations: (***State how many squares your foot covered here.***)

Calculations: (***Show all working. Do not write out the guides. Only write out the words in bold. This should go on its OWN page.***)

a. Mass of student: A kg

b. Weight of student: A kg × 10 N/kg = B N

c. Area of traced foot: (amount of squares foot covered ÷ 104 cm2) × 1 m2 = G m2

d. Approximate area of both feet: 2 × G m2 = E m2

e. Pressure one foot exerts on Earth: B N ÷ G m2 = D N/m2 = D Pa

f. Pressure both feet exert on Earth: B N ÷ E m2 = F N/m2 = F Pa

Data and Results:

Table 1. RESULTS SHOWING HOW PRESSURE IS DEPENDENT ON SURFACE AREA

|  |  |
| --- | --- |
| **Data Collected** | **Calculated Values** |
| Mass of student (kg) |  |
| Weight of student (N) |  |
| Area of foot (m2) |  |
| Area of both feet (m2) |  |
| Pressure one foot exerts on Earth (N/m2) |  |
| Pressure both feet exert on Earth (N/m2) |  |

Discussion: (***DO NOT repeat your METHOD here.***)
Paragraph 1
a. Define pressure.
b. Explain how it is affected by area.

Paragraph 2
a. Use your results to explain your aim.

Limitation:

1.

Precautions:

1. Parallax was avoided when recording the length of the spring by reading the ruler directly.

2.

Reflections: (***Do NOT use the following reflection. This is just an EXAMPLE.***)

I now know why wearing stilettos are so painful. This is because all of your weight is focused on very little surface area hence the pressure the heels and toes feel would be very high. Shoes that are comfortable to wear are often flat and broad and even contain cushioned soles in turn the wearer does not feel much pressure on their heels or toes.

Conclusion: (***This section should be related to your aim. Do NOT repeat your method here.***)
(**Example: Pressure is dependent on surface area**)

**Observation & Recording – Pressure**a. Student’s ability to record observations and
to collect and organise data; observations and
data may be recorded in:
(i) Prose
Written description of observations in the correct
tense /1
(ii) Table
Appropriate headings /1
Title given /1
Data present /2
a. All data present (2)
b. Some data present (1)
c. No data present (0)

(b) Reporting
Student’s ability to prepare a comprehensive
written report on their assignments using the
following format:
(i) Date (date of experiment) /1
(ii) Aim (what is to be accomplished by
doing the experiment /1
(iii) Apparatus and Materials
(all equipment and materials
used in the experiment
must be listed) /1
(iv) Method/Experimental
Procedure /2
(a) step by step procedure (1)
(b) written in past tense (1)

**Total: /10**