Task 1

1. What is pressure? Complete the sentences using the words below.

is the amount of pushing on a certain *.* The

amount of depends upon the size of the and the size of

the it is pushing on.

|  |  |  |
| --- | --- | --- |
| **force** | **area** | **pressure** |

Task 2

How is pressure calculated? This is the formula to calculate pressure.

|  |  |  |
| --- | --- | --- |
| pressure | = | force (Newtons)  area (m2) |

1. Can you rearrange it to work out force? **force** =
2. If the units for force are Newtons and the units for area are cm2 what do you think

the units for pressure will be? .

1. Use the formula to work out the following pressure problems.
2. A stone statue has a weight of 3 000 N and its base has an area of 0.6 m2. What is the pressure exerted by the statue on the floor?

1. A car weighs 5 000 N. Each tyre supports one quarter of the weight of the car.

The pressure **each** tyre exerts on the road is 5 000 N/m2. What is the area of each tyre in contact with the ground?

Task 3

Calculate the pressure you put on the ground.

1. To work out your force, step on the Newton scales and record your force (if there are no Newton scales, get your mass in kg and times it by 10).

Your force (N) = N

1. To get your area, draw round one foot 1cm2 on squared paper and count the squares inside your foot outline (count whole squares and then count the squares 50% full or more). Multiply this number by two.

area of feet in contact with floor = cm2

1. Finally, using the formula above, calculate the pressure you exert on the ground.

Pressure = N ÷ cm2

1. Pressure exerted = N/cm2
2. Describe two ways that you could **decrease** the pressure that you exert on the ground.

1. Describe two ways that you could **increase** the pressure that you exert on the ground.

Task 4 – high or low pressure?

Read through the following situations and decide whether the pressure would be high or low. Write ***high*** or ***low*** next to each situation:

1. Ice skates have a thin blade in contact with the ice.
2. Snow shows are large to stop people sinking when walking on the snow.
3. A camels foot is large and padded so they do not sink in the sand.
4. A sharp knife has a thin blade to cut through objects easily.
5. A drawing pin can be pushed into a surface quite easily with a small force.

Task 5

Answer these questions using your knowledge of pressure.

1. Which do you think exerts the greater pressure on the ground, an elephant or a lady wearing stiletto heels? Which is more likely to damage the floor? Now work out the pressure for each (tip: remember the number of feet they have).

|  |  |  |  |
| --- | --- | --- | --- |
| MP900430836[1] | Weight of the elephant: 50 000 N  Area of each foot: 500 cm2 |  | Weight of the person: 500 N  Area of each foot: 10 cm2 |
| Pressure exerted by elephant = | Pressure exerted by person = |

1. Calculate the pressure of each type of footwear:

weight of the

elephant = 50,000N

area of each

foot = 500cm**2**

|  |  |  |
| --- | --- | --- |
|  | Weight of the wearer: 600N  Area of a pair of shoes: 150 cm2 | Pressure of exerted by wearer = |
| [http://www.antiques.com/vendor_item_images/2050_1975157112_1109308_Child_s_Snow_Shoes.jpg](http://www.antiques.com/classified/Instruments-and-Implements/Antique-Fishing---Sports/Antique-Child--s-Snow-Shoes) | Weight of the wearer: 600N  Area of a pair of snow shoes: 800 cm2 | Pressure exerted by wearer = |
| [walking boots](http://rearmingkits.com/wp-content/uploads/2013/04/walking-boots-a32.jpg) | Weight of the wearer: 750N  Area of a pair of boots: 300 cm2 | Pressure exerted by wearer = |