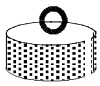
PhyzJob: Weight of the Worlds

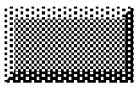
Neelix

On your next voyage to distant planets, you can determine the acceleration due to gravity by weighing standard masses as well as dropping objects to check their acceleration. You have with you the following masses and weights originally marked on Earth. [On Earth, $g = 9.8$ m/s^2.]



A: $m = 1.0$ kg

W = 9.8 N



B: $W = 1.0$ N

0.10 kg

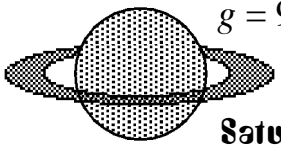
C: $m = 25$ kg

245 N

D: $W = 12$ N

1.2 kg

From the information given, fill in the missing information regarding the weight and mass of the objects on other planets. *[Hint: It may be helpful to calculate the weight of A & C and the mass of B & D on Earth first.]*



$g = 9.1$ m/s^2

Saturn

$m_A =$ 1.0 kg (given above)
$m_B =$ 0.10 kg (get the HINT above)
$m_C =$ 25 kg
$m_D =$ 1.2 kg

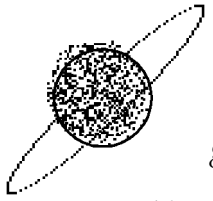
$W_A =$ mg=1.0 kg·9.1 m/s^2 = 9.1 N
$W_B =$ 0.91 N
$W_C =$ 230 N
$W_D =$ 11 N

$g =$ 25 m/s^2

Rigel IV

$m_A = 1.0$ kg
$m_B =$ 0.10 kg
$m_C =$ 25 kg
$m_D =$ 1.2 kg

$W_A = 25$ N
$W_B =$ 2.5 N
$W_C =$ 630 N
$W_D =$ 30 N



$g = 4.0$ m/s^2

Algon
where an ordinary cup of drinking chocolate costs £800,000,000

$m_A = 1.0$ kg
$m_B =$ 0.10 kg
$m_C =$ 25 kg
$m_D =$ 1.2 kg

$W_A =$ 4.0 N
$W_B =$ 0.40 N
$W_C =$ 100 N
$W_D =$ 4.8 N

$g =$ 40 m/s^2

T'kon V

$m_A =$ 1.0 kg
$m_B =$ 0.10 kg
$m_C =$ 25 kg
$m_D =$ 1.2 kg

$W_A =$ 40 N
$W_B =$ 4.0 N
$W_C =$ 1000 N
$W_D = 48$ N