**The National Orthodox School /Shmaisani**

**Subject: Science/ Physics**

**Name: Title: Moments**

**Date: Grade-Section: 8 …… CS**

**Turning Effect:**

The turning effect of a force is called the **moment** of the force.

The moment of the force depends on two things:

* The size of the force
* The distance between the line of the force and the turning point is called the **pivot** or **fulcrum**.

We calculate the moment of force using the following formula:

Moment of a force = force x distance from pivot

Moment = F d

M

Moment is measured in newton meters (Nm)

F= force in newtons (N)

d

F

d= distance in meters (m)

Core: (Solve the following 8 questions)

Test your understanding:

1. What is the moment of this force?



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1. What is the length of this lever if the **moment** is **8 Nm**?
2. Calculate the moment if a force of 5.0 N is applied to a crowbar 15 cm long.
3. A force of 20 N is applied to a door causing a moment of 5 Nm.

Calculate the distance in cm from the hinge axle to the point on the door where the force was applied.

1. What force must be applied to a 30 cm long spanner to generate a moment of 6.0 Nm?
2. What distance should a force of 18N be applied to generate a moment of 142 Nm?
3. What force must be applied to a 0.8m long rod to generate a moment of 250Ncm?

**The principle of moments:**

The principle states that when a body is in equilibrium ( balanced) the sum of the clockwise moments about any point (such as the fulcrum or pivot) equals the sum of the anti-clockwise moments about that point.

In other words:

Sum of clockwise moments = Sum of anti-clockwise moments

Intermediate: (Solve 9 from the following 11 questions)

Test your understanding:

1. Which of the following see-saws are balanced?



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1. All of these see-saws are balanced. Work out the missing number for each one.





Advanced: (Try solving the following question)

1. A uniform plank is pivoted at its mid-point. Two weights are added to the plank as shown. A vertical force is applied at point X to balance the plank. What is the size of this force? Show your work and units

