**Principle of Moments**

Every turning moment is either a clockwise moment or anticlockwise moment. You can have both a *clockwise* and an *anticlockwise* moment on a lever, such as on a see-saw. The Principle of Moments states that when the clockwise moment equals the anticlockwise moment, the system is in *equilibrium*. Equilibrium is a state of physical balance.

* *Balanced or Unbalanced?*

To work out if this is balanced, you need to calculate the two moments. If they are equal then the system is balanced. If they are unequal, one moment will be bigger than the other and the lever will turn.

1. Will these situations be balanced or unbalanced?   
   *Complete the table with your answers. The first has been done for you.*
   1. LM: 10 N acting 10 m from pivot. RM: 5 N acting 20 m from pivot.
   2. LM: 15 N acting 30 m from pivot. RM: 20 N acting 20 m from pivot.
   3. LM: 14 N acting 20 m from pivot. RM: 20 N acting 14 m from pivot.
   4. LM: 10 N acting 50 m from pivot. RM: 30 N acting 15 m from pivot.

Left Moment Right Moment

***M****oment* = ***F****orce* × ***d****istance* ***M****oment*  = ***F****orce* × ***d****istance*

= 10 N × 10 m = 5 N × 20 m

= 100 Nm = 100 Nm

|  |  |  |  |
| --- | --- | --- | --- |
|  | Left Moment | Right Moment | Balanced or turning? |
| a. | 100 Nm | 100 Nm | It is balanced. |
| b. |  |  |  |
| c. |  |  |  |
| d. |  |  |  |

1. What is the formula for a turning moment?

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1. Fill in the formula triangle for a turning moment:
2. What is the turning moment when 5 N of force is applied on a lever of 2 m?

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1. What is the turning moment when 2 N of force is applied on a lever of 10 m?

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1. What is the principle of moments?

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1. Is this moment balanced or unbalanced?

**Left Moment**

***M****oment* = ***F****orce* × ***d****istance*

= . . . . . N × . . . . . m

= . . . . . Nm

**Right Moment**

***M****oment* = ***F****orce* × ***d****istance*

= . . . . . N × . . . . . m

= . . . . . Nm

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