**Vocabulary:** **Inclined Plane – Rolling Objects**



**Vocabulary**

* Moment of inertia – a measurement of an object’s resistance to changes in rotation.
	+ Moment of inertia is represented by the symbol *I*.
	+ The SI unit of moment of inertia is the kilogram meter squared (kg⋅m2).
	+ The moment of inertia of a collection of masses is equal to the sum (Σ) of each mass (*m*) multiplied by the square of its distance from the axis of rotation (*r*):



* + - For example, suppose a weightless disk contains a 4-kg mass that is 3 m from the center and a 5-kg mass that is 2 m from the center. The moment of inertia of the disk is:

4 kg × (3 m)2 + 5 kg × (2 m)2 = 36 kg·m2 + 20 kg·m2 = 56 kg·m2

* + Moment of inertia plays the same role in most equations about rotational motion as mass does in equations about linear motion.
* Rotational kinetic energy – kinetic energy due to rotation.
	+ Symbols for rotational kinetic energy include *RKE* and *KERot*.
	+ For a rotating object, the formula for rotational kinetic energy is:



In this equation, *I* represents moment of inertia and *ω* represents angular speed.

* Translational kinetic energy – kinetic energy due to linear motion.
	+ Symbols for translational kinetic energy include *TKE* and *KETrans*.
	+ For a moving object, the formula for translational kinetic energy is:



In this equation, *m* represents mass and *v* represents velocity.