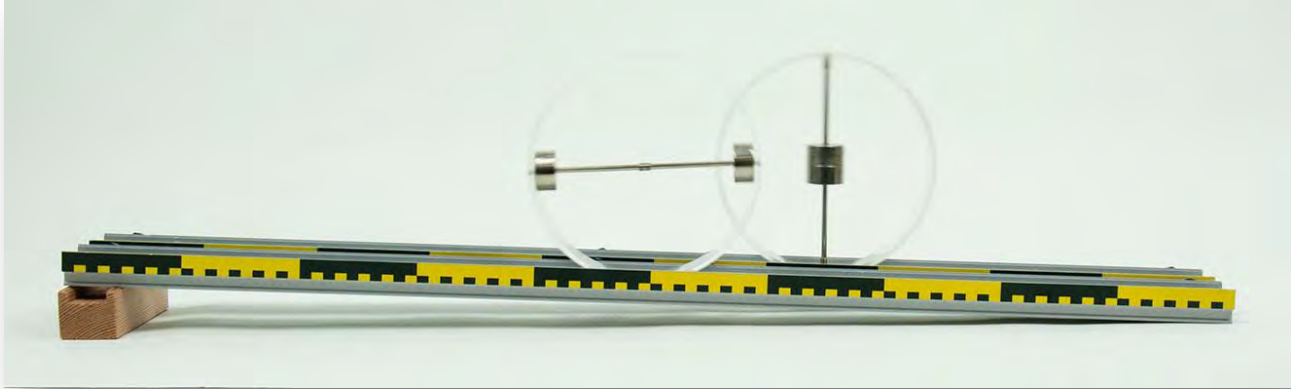


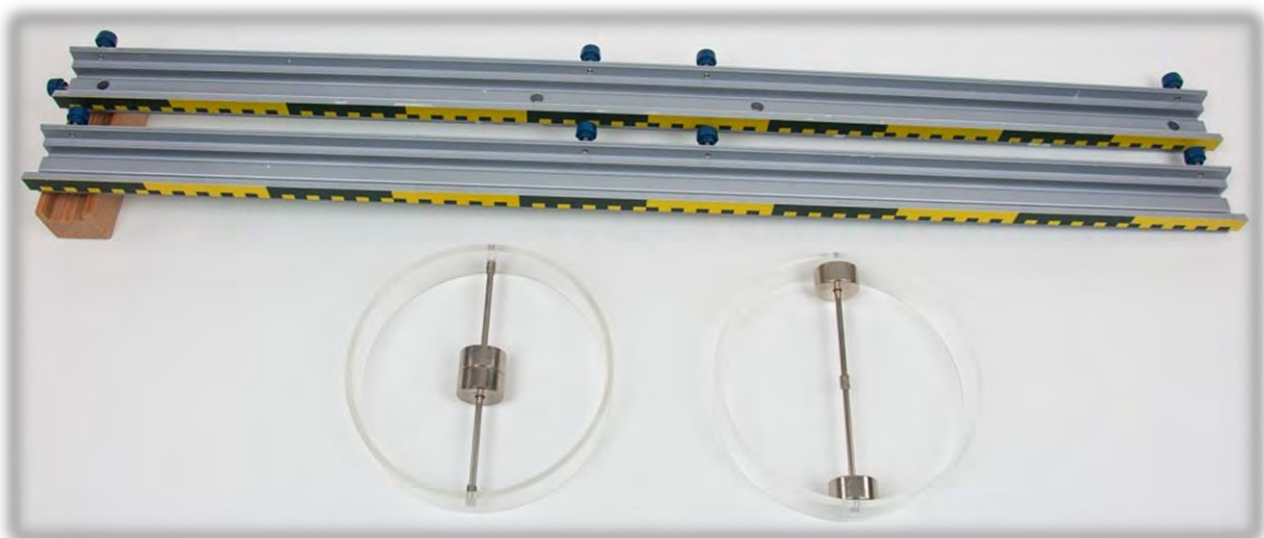
VARYING MOMENTS OF INERTIA AND MASS DISTRIBUTION - QUALITATIVELY

MED 09.14a



Material

Item-no.	Qty.	Description
DS101-3B	1	Stand rail with scale, L=1000 mm
DS101-4B	1	Universal rail with scale and holes, L=1000 mm
P1321-3K	1	Block for light gate
DM360-2R	2	Rotating ring, D=200 mm



VARYING MOMENTS OF INERTIA AND MASS DISTRIBUTION - QUALITATIVELY

MED 09.14a

Purpose

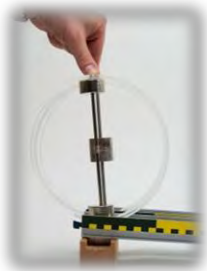
Detection of varying moments of inertia with the same mass and the same outside diameter.

Preparation

Place the two rails upside down on the block for light gate as seen on the images to the right; make sure that they are positioned parallel to each other.



The metal cylinders of the first rotation ring are positioned on the outer part of its thread while the metal cylinders of the second rotation ring are placed in the centre of its thread.

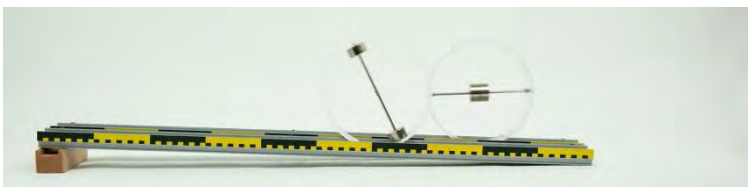
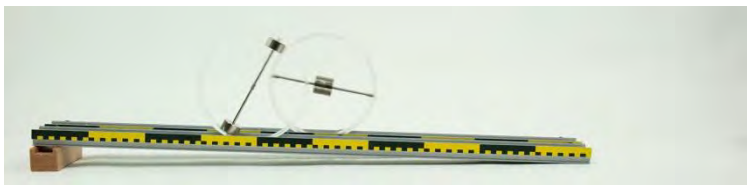


Experiment

Place the rotation rings at the higher end of the tracks parallel and hold them in this position.



Now let the rotations rings loose and observe what is happening.



Conclusion

The rotating ring with the metal cylinders placed in the centre is faster.

Explanation

A rolling body performs translation and rotation at the same time.

The kinetic energy is divided between the rotational energy and translation energy.

The further the mass particles are from the axis of rotation, the greater their moment of inertia. In this case a large proportion of the total energy $E = m \times g \times h$ is converted into rotational energy but the body therefore has less translational energy available.