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PHYSICAL PHENOMENA AUGMENTED REALITY BOOK

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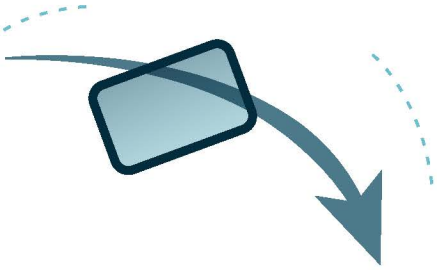

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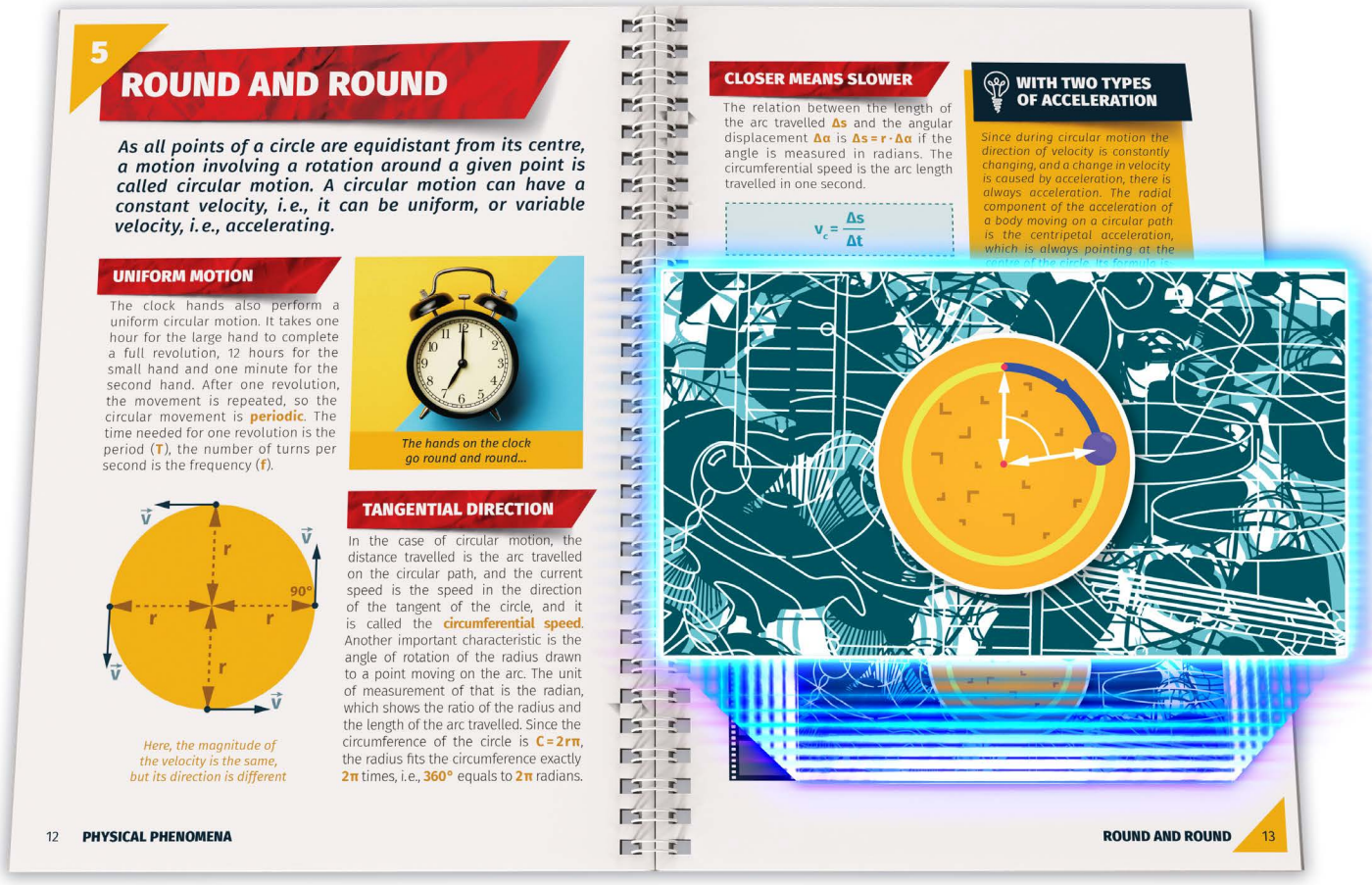

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ROUND AND ROUND

As all points of a circle are equidistant from its centre, a motion involving a rotation around a given point is called circular motion. A circular motion can have a constant velocity, i.e., it can be uniform, or variable velocity, i.e., accelerating.

UNIFORM MOTION

The clock hands also perform a uniform circular motion. It takes one hour for the large hand to complete a full revolution, 12 hours for the small hand and one minute for the second hand. After one revolution, the movement is repeated, so the circular movement is **periodic**. The time needed for one revolution is the period (**T**), the number of turns per second is the frequency (**f**).

The hands on the clock go round and round...

Here, the magnitude of the velocity is the same, but its direction is different

TANGENTIAL DIRECTION

In the case of circular motion, the distance travelled is the arc travelled on the circular path, and the current speed is the speed in the direction of the tangent of the circle, and it is called the **circumferential speed**. Another important characteristic is the angle of rotation of the radius drawn to a point moving on the arc. The unit of measurement of that is the radian, which shows the ratio of the radius and the length of the arc travelled. Since the circumference of the circle is $C = 2r\pi$, the radius fits the circumference exactly 2π times, i.e., $360°$ equals to 2π radians.

CLOSER MEANS SLOWER

The relation between the length of the arc travelled Δs and the angular displacement $\Delta\alpha$ is $\Delta s = r \cdot \Delta\alpha$ if the angle is measured in radians. The circumferential speed is the arc length travelled in one second.

$$v_c = \frac{\Delta s}{\Delta t}$$

WITH TWO TYPES OF ACCELERATION

Since during circular motion the direction of velocity is constantly changing, and a change in velocity is caused by acceleration, there is always acceleration. The radial component of the acceleration of a body moving on a circular path is the centripetal acceleration, which is always pointing at the