

WORKSHEET : KEPLER'S 3RD LAW

Take some time to explore and play. Notice that the timer can be dragged to any convenient place on the movie.

- What do you think makes the planet revolve around the sun?
- Comment on the following statement: “The planet makes one round in equal times, so its speed is constant. Since its speed is constant, there is no acceleration, and hence there is no force that acts on the planet.”
- If we suspect the law is of the form $T \propto r^n$, how should we go about investigating if that is true? Is it necessary to know the units of the quantities?
- A student says: “If I choose to represent the relation between 2 variables in the form $y \propto x^n$, keep all the other parameters constant, and take the approach as above, I can uncover the relation, whether it is linear, quadratic, cubic or for any real value of n. So an initial hypothesis like this is sure to work.” Point out the fault in the above argument.
- The counter could have been programmed to run at different rates. How would that affect the precision of the timing? What about the accuracy?
- Student A records the time the planet takes to cover a quadrant, and multiplies the time by 4 to get the period, while student B takes the time needed for the planet to go 4 rounds and divided the time taken by 4. Which method is better and why?
- What really happens out there? How different is this movie from the real situation?

