RACK AND PINION EXAMINATION QUESTION

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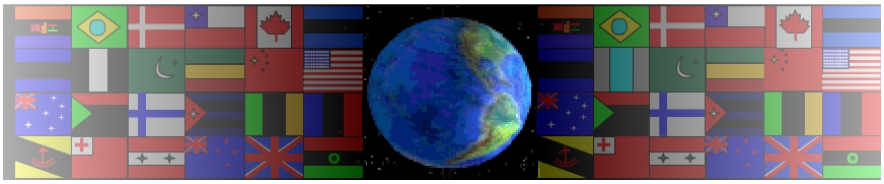
On behalf of The World Association of Technology Teachers

W.A.T.T.



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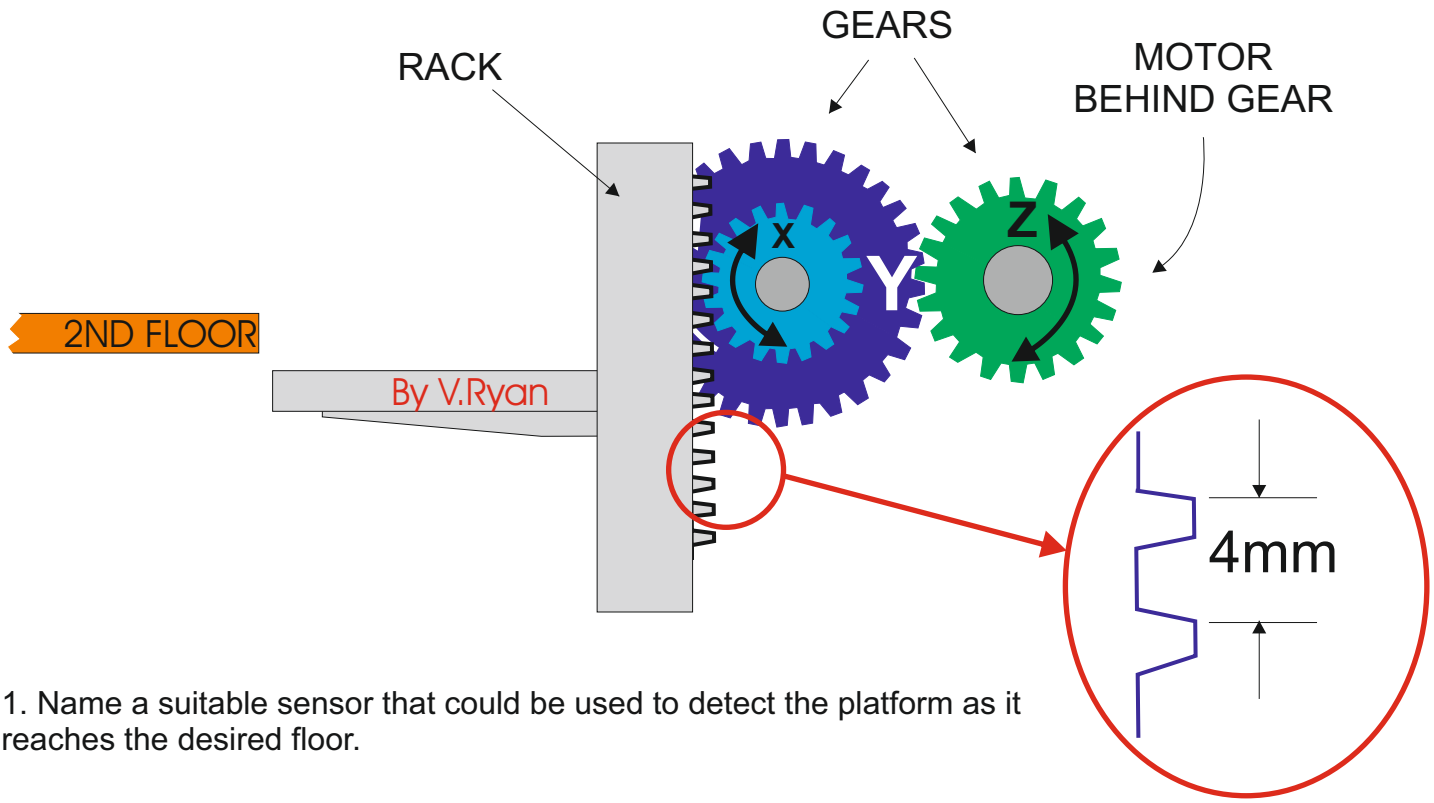
The diagram below displays a platform that is used to lift boxes from one floor to another in a warehouse. The platform is fixed to a rack which operates through gears. As the gears turn the platform moves up or down depending on the direction of rotation. Gear Z is the driver as it is connected directly to a motor.
Basic information:
Gear Z = 13 teeth
Gear Y = 39 teeth
Gear X = 13 teeth



1. Name a suitable sensor that could be used to detect the platform as it reaches the desired floor.

2. On the drawing above, sketch the position of the sensor.

3. How is the sensor used?

4. When the motor is turned on it rotates at 240 rev/min (rpm)

(i) How many times will gear X turn in one minute?

(ii) How far does the platform travel in one minute?