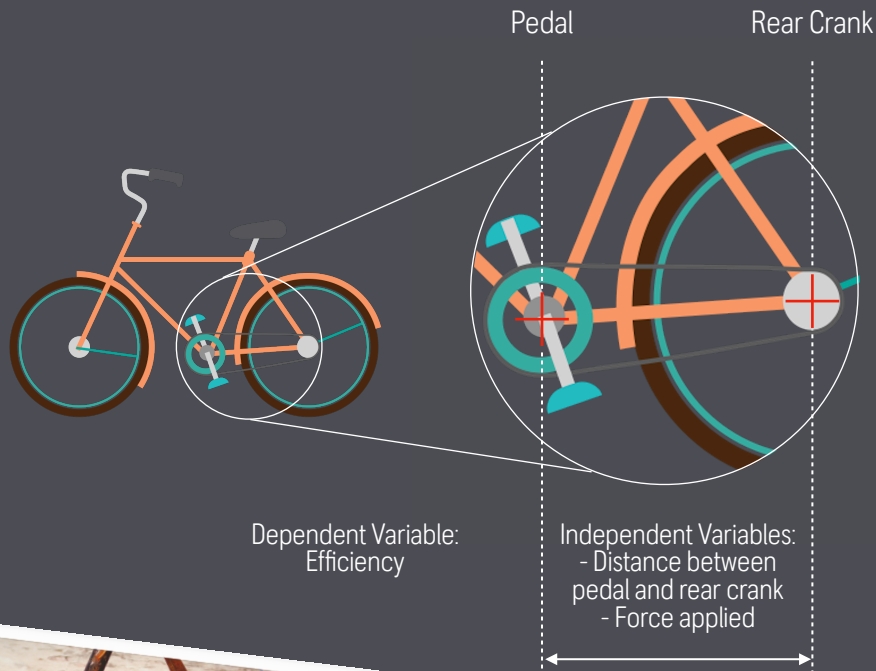
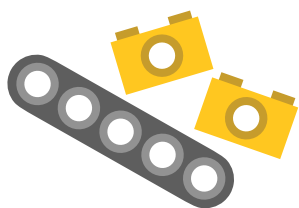


How distance between pedal and rear crank of a bicycle affects efficiency of rider for different input forces



Testing

A prototype was created out of Lego Technic pieces.

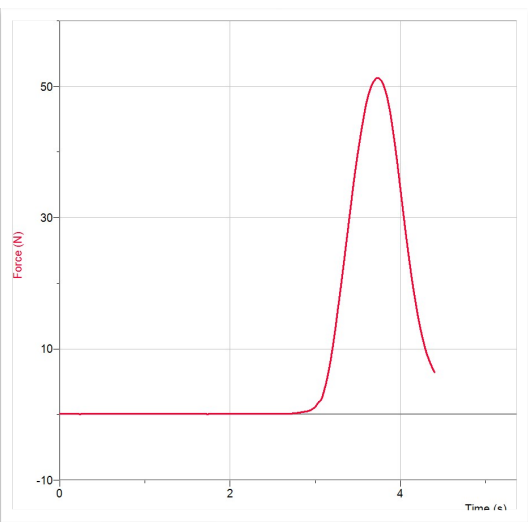


Experiment

An old bicycle was taken apart and extended frame rails were added to easily vary the distance between the pedal and rear crank. The experiment involved a lot of hands-on mechanics as everything had to be hand-fabricated for the research to give the most accurate details.

Observation

For a force of 250 g applied at 53cm of separation it was observed that the efficiency was greater than 100% which means that it was an anomaly due to some random errors in the conduction of the experiment, but the trend was continuous for each force and resulted in the conclusion that the cycle is the most efficient at 53cm.



Sample graph from the Force Meter - The Peak was interpreted as the output force

Conclusion

The research brings out the fact that the efficiency of a rider decreases with an increase in the force which tells us that riders will save energy if they pedal with more revolutions but less force. The research also tells us that the bike is the most efficient when the distance is 53cm.

