Automation & Robotics Virtual Learning

7th & 8th Gear Ratios Day 4

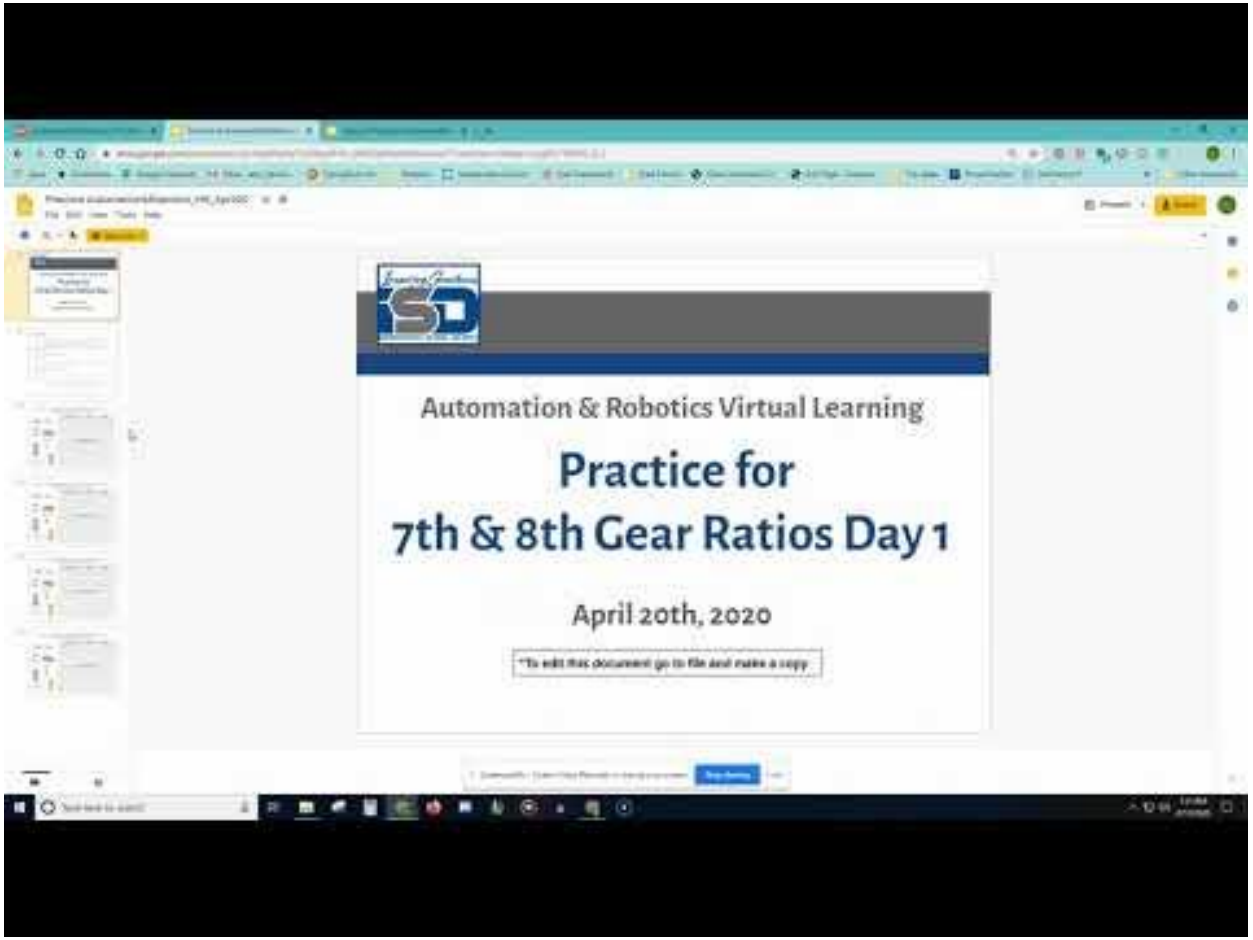
April 28th, 2020

PLTW: Automation & Robotics
Lesson: Gear Ratios Day 4 [April 28th]

Objective/Learning Target:
Students will review their knowledge of gear ratios and demonstrate their understanding of how gear ratios affect speed and torque in a mechanism.

Instructions (same as Day 1)

Don't Forget! This week we will be reviewing our knowledge of unit 1.1 What is Engineering and Gear Ratios. We will alternate every other day.

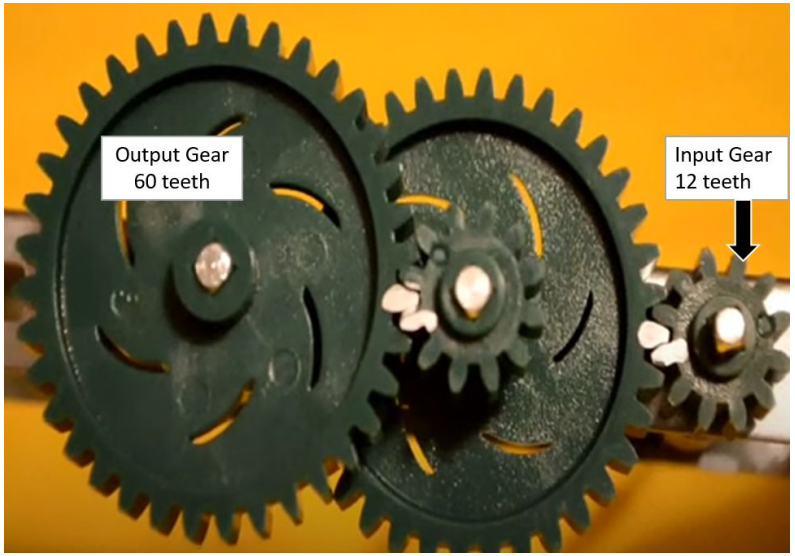


Link to video

Warm-up

*To complete the Warm-up, practice, and questions electronically, click here

Using the picture to the right of a compound mechanisms.



- What is the current gear ration?

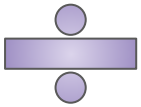
- What is the simplified gear Ratio?

- What is happening to torque?

- What is happening to speed?

- Why doesn't your gear ratio include the two gears in the middle?

1.) What is the simplified gear ratio for 35:15 and what is happening to Speed and Torque?



Text box

Constant

Decreasing

Increasing

Solution box

Input	Output

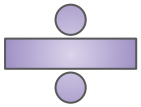
Speed	Torque

Show your work here:

On the next slide you have been given the simplified gear ratio and the torque and speed. You must:

- Give the original Gear ratio
- Show the work

2.) What is the simplified gear ratio for _____:____ and what is happening to Speed and Torque?



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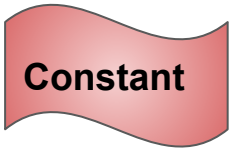


Solution box

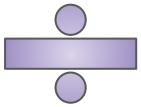
Input	Output

Speed	Torque
Increasing	Decreasing

Show your work here:

$\frac{6}{5}$

3.) What is the simplified gear ratio for 8:7 and what is happening to Speed and Torque?



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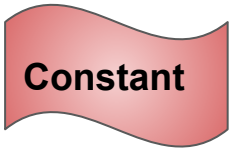
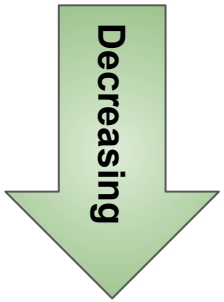
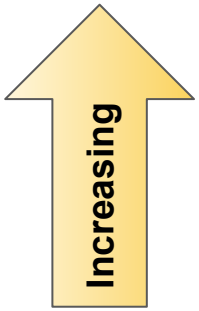




Solution box

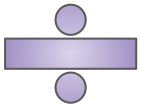


Input	Output

Speed	Torque

Show your work here:

4.) What is the simplified gear ratio for 10:30 and what is happening to Speed and Torque?



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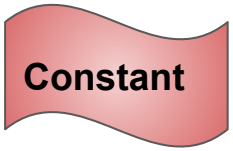
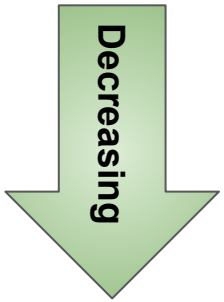
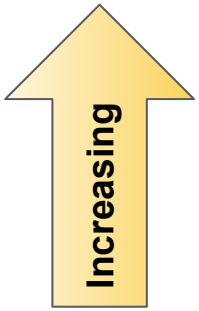




Solution box

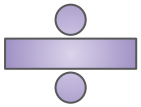


Input	Output

Speed	Torque

Show your work here:

5.) What is the simplified gear ratio for 54:16 and what is happening to Speed and Torque?



Text box

Constant

Decreasing

Increasing

Solution box

Input	Output

Speed	Torque

Show your work here:

Extend your learning

Give a family member the following gear ratio:

16:12

Ask them to simplify the ratio and then teach them one of the facts about Speed.