

Gear Ratio Activity

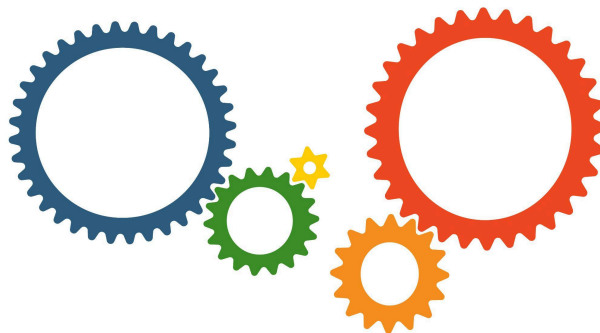


Image: KEP created gears illustration

Materials and Resources:

- Optional: Graph Paper
- Optional: [Gear Ratio Kit from KEP](#)

Directions:

Create a gearbox for each ratio listed below with your provided materials. If needed, you can draw the ratios instead of using the gearbox. How many attempts did it take?

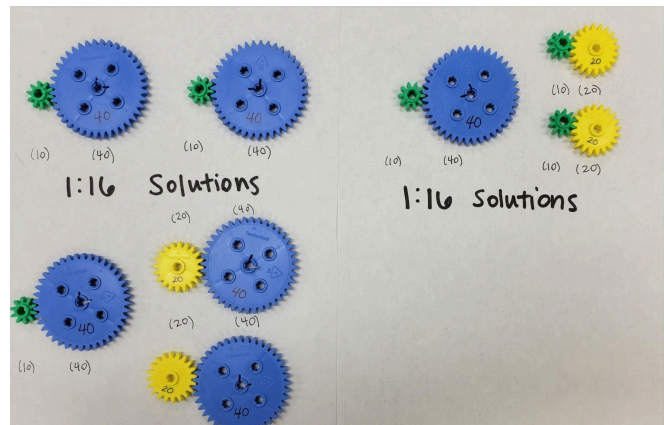
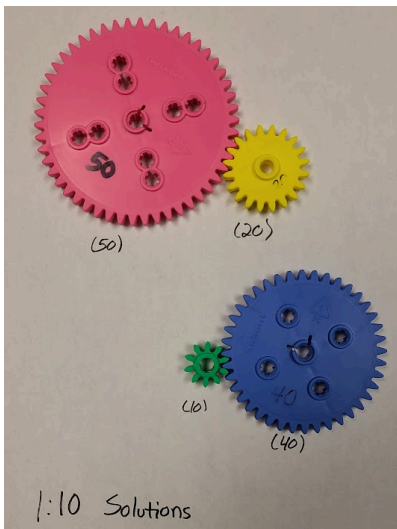
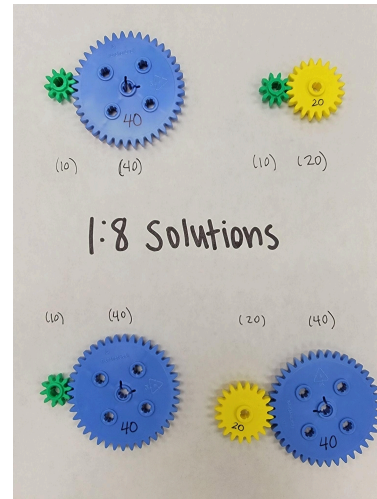
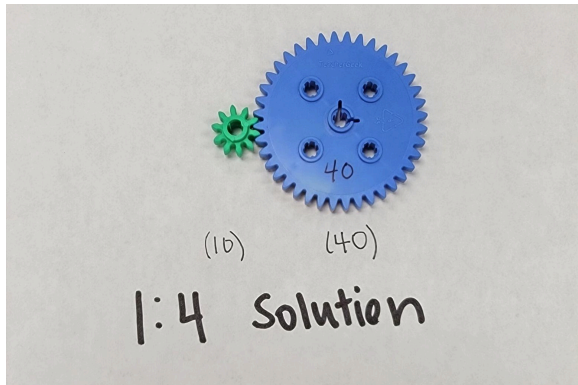
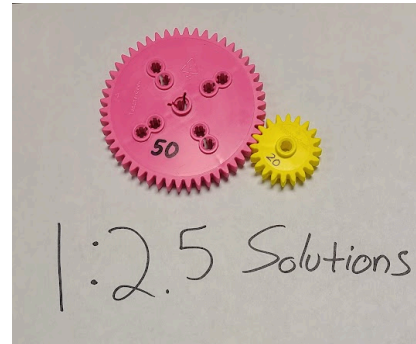
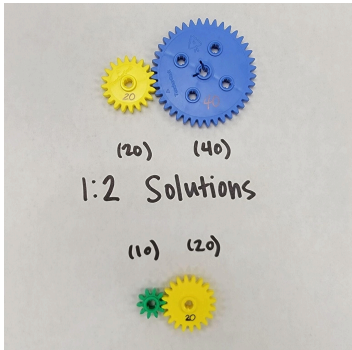
Gear Ratio Tasks:

- 1:2 Gearbox
- 1.2.5 Gearbox
- 1:4 Gearbox
- 1:8 Gearbox
- 1:10 Gearbox
- 1:16 Gearbox

Example Questions:

- Which gear ratio would benefit electricity production most?
- The gearbox of a wind turbine is made up of three gears. The largest gear has 1,260 teeth and is connected to a second gear with 70 teeth. The 70-tooth gear then connects to the last gear with 14 teeth.
 - What is the gear ratio of this wind turbine?
 - If the blades spin at 15 rotations per minute (RPM), how fast does the generator shaft rotate?

Gear Ratio Solutions:



NOTE: There may be other solutions not shown above. This activity was originally created for the 2023 Kansas KidWind Challenge Instant Challenge and does not consider the driver or driven gear.

Answers to Questions:

- Which gear ratio would benefit electricity production most? **Answer - 1:16**
- The gearbox of a wind turbine is made up of three gears. The largest gear has 1,260 teeth and is connected to a second gear with 70 teeth. The 70-tooth gear then connects to the last gear with 14 teeth.
 - What is the gear ratio of this wind turbine? **Answer - 1:90**
 - If the blades spin at 15 rotations per minute (RPM), how fast does the generator shaft rotate? **Answer - 1,350 RPM**



ENERGY EDUCATION EVENT

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