Name: _____

Wheels & Levers

Date: _____

What Role Do Wheel and Axle Systems Have in Moving Vehicles and Devices?

Discover: Building with Chains and Gears

Question

How can you solve engineering problems with gears, wheels, and chains?

In the next activity, you will practice building with gears, wheels, and chains to solve some engineering problems.

Resources

Access the website links from the online course.

- YouTube Video: Gear Basics
- Toy construction kit that includes wheels, gears, and axles such as K'nex or similar type of kit
- Optional - Yenka Gears software
- Optional - digital camera

Safety Warning: If you choose to use paper and scissors for this activity, be careful not to poke or cut toward yourself or anyone else.

Instructions

1 Watch the YouTube Video: **Gear Basics**. Listen and watch carefully to learn how gears are used.

2 Read the table of ***Gear and Wheel Engineering Challenges*** located on the next page. You will choose three of the challenges and work to solve your choices.

Need a Hint?

For all your challenges, the first gear in your gear train should be your driving gear. For example, if you were asked to build a two-gear train that increases spin speed, your first gear would be a big gear, and your second gear would be a smaller gear that would spin faster.

Gear and Wheel Engineering Challenges		
A A gear train of three gears that increases spin speed.	**B** A gear train of four gears that does not change spin speed.	**C** A gear train of two gears that decreases spin speed.
D A gear train of four gears that increases spin speed.	**E** A gear train of two gears with one chain that does not change spin speed.	**F** A gear train of five gears that decreases spin speed.
G A gear train of three gears that does not change spin speed.	**H** A gear train of three gears that decreases spin speed.	**I** A gear train of two gears with one chain that increases spin speed.

3 Following are three options for doing this activity. CHOOSE ONLY ONE!

- **Option 1: Use a building kit** such as K'nex, or similar type of kit to build solutions to the three challenges you chose from the table of *Gear and Wheel Engineering Challenges*. If you have a camera available, take a digital photo of your solutions.
- **Option 2: Use Yenka software** to build solutions to the three challenges you chose from the table of *Gear and Wheel Engineering Challenges*.
- **Option 3: Create your own** paper or cardboard gears. There are many **YouTube** videos that can help you do this. Please make sure that you are always acting safely, and have adult permission when using scissors or knives.

Skill Builder

How to use Yenka Gears.

How to build with K'nex using gears.

If you need to use this Skill Builder, access it from the online course.