Discovery Quest

Playgrounds!

27th April – 1st May

L.Q. How do gears and cogs work?

Watch this video on how a gear works:

https://www.youtube.com/watch?v=vX1-9C58-VM

What Are Gears and Cogs?

Gears are wheels that have teeth, or cogs, around the edges. The cogs of one gear fit into the cogs of another. Every time you ride in a car, you're using gears. Cars have multiple gears that change the speed or force. Gears are used in watches, carousels, toys, machines...the possibilities are endless!

How Do They Work?

The great thing about gears is that they move in opposite directions. In other words, when one gear turns to the right (clockwise), the gear attached to it will turn to the left (counterclockwise). This pattern continues to repeat, regardless of how many gears are attached to each other. For example, in a gear train with four gears, gear A turns clockwise, gear B turns counterclockwise, gear C turns clockwise, gear D turns counterclockwise.

How Do Gears Transfer Energy?

As gears turn, energy is transferred from one gear to another. They can either increase or decrease **speed** or **force**, but not both at the same time. You have to lose something to gain something.

A gear train

Let's say you have a large gear attached to a small gear. The large gear is the drive gear, which means it's causing the small gear (driven gear) to turn. As the larger gear turns, the small one will speed up to keep up with it. This type of gear sequence increases speed.

Another use of gears is to give a machine more power. Now, if a large truck needed to drive uphill, the vehicle would have to use a smaller gear to turn a larger one. The

smaller gear transfers its energy to the larger one, which has more force and can help push the truck up the hill as the driver accelerates.

Your task is to look around your house or your local park and list all the things you can find with cogs and gears.

Hint! You might have one in your kitchen drawer.

Then, I'd like you to draw it and write a brief explanation of how it works.