BIG IDEA:

Gears are rotating wheels with teeth that lock together to transmit torque and speed. When one gear is turned, the other gear turns and puts something into motion. Geared devices can change the speed, torque, and direction of a power source. Gears can be found in bicycles, cars, can openers, clocks, drills, and wind-up toys. Through discovery and conversation, young children can begin to understand how gears work and identify everyday items that function using gears.

OBJECTIVES:

Students will identify and describe everyday items that function using gears.
Students will understand the basic function of gears.
Students will explore how gears work together to transfer motion.

FOCUSED LEARNING STANDARDS:

(K) K-2.DT.1.c-Explain that systems have parts or components that work together to accomplish a goal.
(K) K-2.DT.1.d.-Give examples of how resources such as tools and materials are things that help people get a job done.
(1st Grade) K-2.DT.1.c-Explain that systems have parts or components that work together to accomplish a goal.
(1st Grade) K-2.DT.1.d.-Give examples of how resources such as tools and materials are things that help people get a job done.
(1st Grade) 1.PS.2-Objects can be moved in a variety of ways, such as straight, zigzag, circular and back and forth.

MATERIALS:

Photos of everyday objects that use gears to move, gears (gear manipulatives or hand-created set), gear challenge cards

KEY VOCABULARY:

Gears, motion, machine, rotate, fast, slow

STEPS:

1) Ask students to find items in the classroom that spin or rotate. Determine if the items use a gear to move and determine where the gear is located.
2) Tell the students gears are parts of a machine that are used to make other parts turn to change the direction of motion.
3) Allow students to play freely with the gears to make new discoveries and inquiries. If using created gears, adhere a template to Styrofoam or cardboard for increase durability.
4) Try using challenge cards to set the focus. Students can pick a card, take the designated number of gears, and build a simple machine with support.

DISCUSSION:

Ask students the following reflection questions:

- Which way do gears turn? What happens if you change the direction?
- What happens when you interlock a large gear and a small gear?
- What happens when you interlock two gears of the same size?

Gears that are different colors and sizes can be used to make patterns. Students can use the gears to make simple AB or more advanced patterns.