3055 BA SANGAM COLLEGE

PH: 6674003/9264117 E-mail: basangam@connect.com.fj

WORKSHEET 26

School: Ba Sangam College Year/level: 10

Subject: Basic Science NAME: _____

Strand 3	Energy
Sub Strand 3.3	Energy transformation, use and conservation
Content Learning Outcome	Investigate ways electricity is produced using simple electrical circuits and determine and calculate consumption of electrical energy in homes deriving ways to conserve this energy.

Lesson Notes - Machines

- A machine is anything that can make our work easier.
- Machines make our work easier in three different ways:

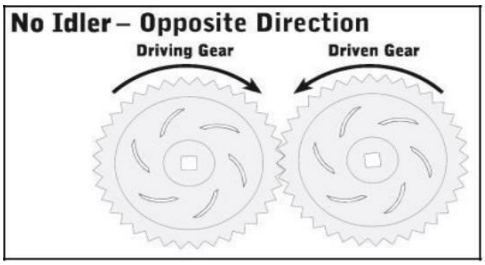
I. It multiplies the force we use
II. It multiplies speed [make things go faster]
III. It changes the direction of force.

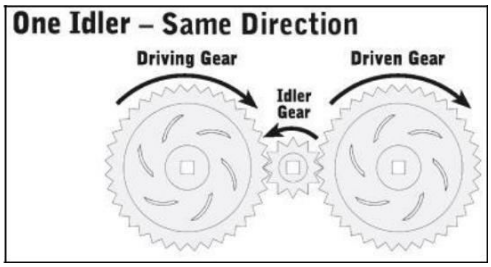
- Simple examples of machines:

1. Broom 	2. Airplane 
3. Cricket Bat 	4. Lawn Mower 
5. Steps 	6. Tractor 
7. Fishing Rod 	8. Spanner 

GEARS

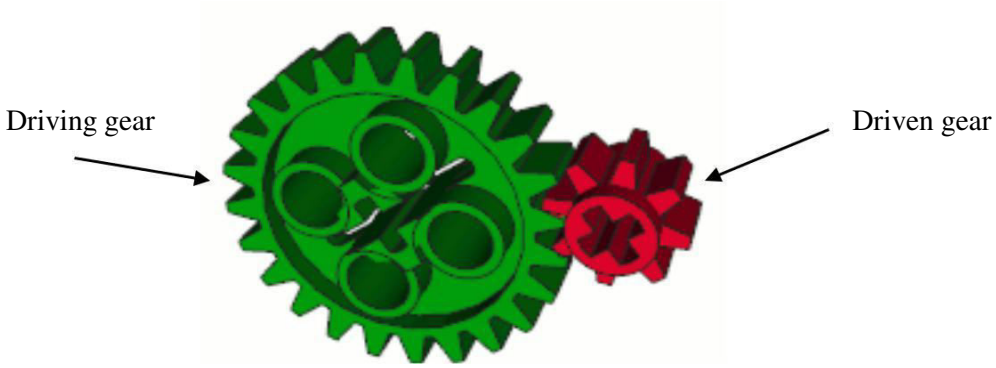
- Gear wheels are wheels with teeth on them.
- The teeth of one gear usually fit into the teeth of another.
- Gears are used to transfer the force from one wheel to another.
- In a bicycle, the large gear wheel attached to the pedals is connected to the smaller gear wheel on the back wheel by the chain.
- When you turn a big gear to the right, the little one will move to the left.



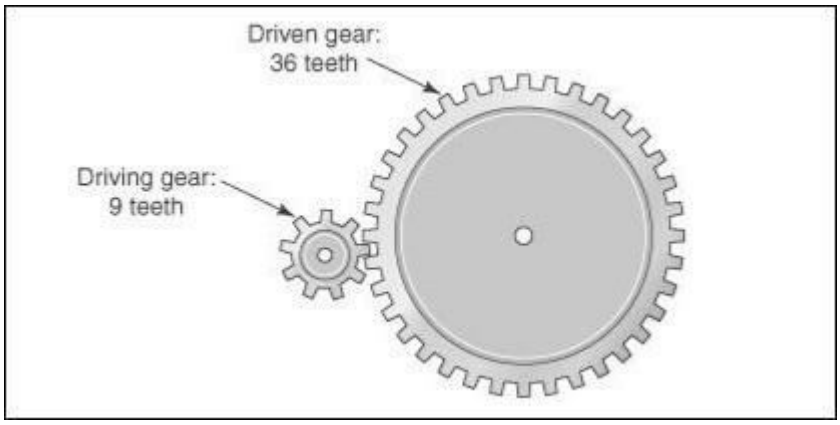


An idler gear is a gear wheel that is inserted between two or more other gear wheels.

- Gears can speed things up or slow things down.



- The large gear wheel has more teeth on it than the smaller gear wheel. The larger gear wheel is called the **driving gear** because it is attached to the motor and therefore supplies the force. The smaller gear wheel is called the **driven gear**.
- This arrangement of gears turns the driven gear faster. Machines that use a larger driving gear include hand beaters and hand drills. When driving gear turns clockwise, driven gear will turn anticlockwise.
- Machines that have a smaller driving gear than the driven gear are for slow rotation.



Uses of Gears

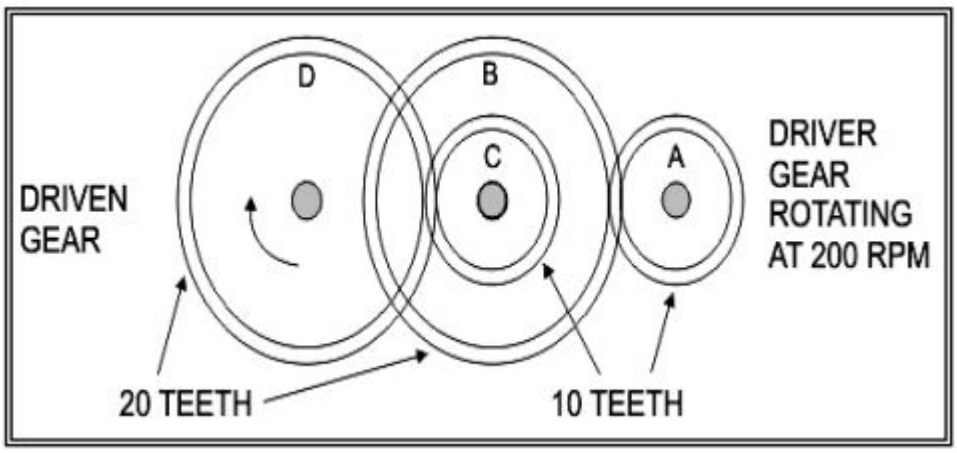
- rides at an amusement park or festival use large gears which make them spin in circles (like the spinning Ferris wheel during Hibiscus festival).
- Huge wind turbines use gears to convert the slow motion of the blades into much faster motion to make electricity.
- are used in clocks to make the minute and the hour hand go around.
- are used in motors: big car motors, and little motors that make your toys move.

WHEEL AND AXLE

- is a simple machine **made up of two circular objects of different size. The axle (a small wheel) is attached to the center of a larger wheel**.
- A wheel and axle lifts or moves loads.
- Effort applied to the wheel turns the axle, or effort applied to the axle turns the wheel. They move together.
- Examples of a wheel and axle can be found in doorknobs, roller skates, pencil sharpener with a handle, steering wheels of a car, screw drivers, treadle sewing machine and wheels of a car.
- Because the wheel is larger than the axle, it always moves through a greater distance than the axle. Such a situation **multiplies the force** applied to the axle

Exercise

1. The gear system shown below is to be added to a hacksaw motor so that the speed of the power hacksaw can be controlled. Study it carefully to answer the questions that follow.



i. In which direction was the driver gear (Gear A) rotating?

_____

(1 mark)

ii. Calculate the RPM (revolutions per minute) of gear B. (Show working)

_____
_____
_____

(2 marks)

2. State 3 ways in which a machine makes our work easier.

_____
_____
_____

(3 marks)