SPEED CHANGE

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GOAL

Observe speed changes during the operation of a manual eggbeater.

OBSERVATION CRITERIA

1. When can a speed change in a motion transmission system be observed?

_____

_____

2. Indicate whether each description below corresponds to a driver or to a driven component (also called the *driven*).

   a) a component at the root of the system's motion that receives the power required to set the system in motion _____

   b) a system component receiving the motion and transmitting it to another part of the object _____

MATERIALS

- manual eggbeater
- non-permanent felt-tip marker
- damp paper towel

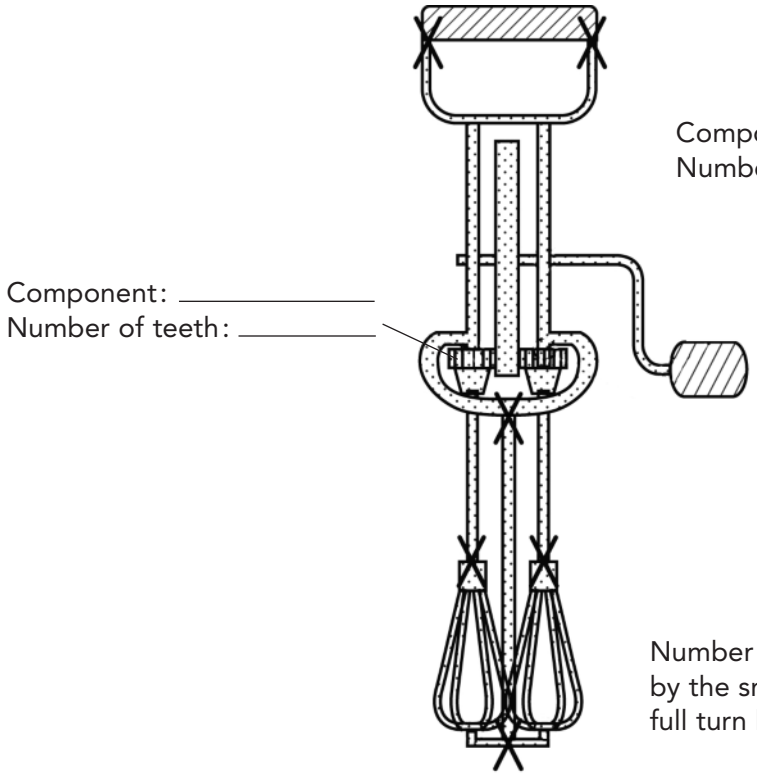
PROCEDURE

1. Operate the eggbeater by turning the crank.
2. Find the transmission motion system's driver and driven components. Record your observations in "Observations."
3. Count and record the number of teeth on each gear.
4. With the marker, colour one tooth on the large gear and one tooth on one of the small gears at the point where they contact.
5. Count the number of full turns this small gear makes during the time it takes the large gear to complete one full turn.
6. With the damp paper towel, erase the marks you made on both gears.

Name: _____ Group: _____ Date: _____

OBSERVATIONS

Record your observations below.



Component: _____
Number of teeth: _____

Component: _____
Number of teeth: _____

Component: _____
Number of teeth: _____

Number of full turns completed by the small gear during one full turn by the large gear _____

REFLECTING ON YOUR OBSERVATIONS

1. Did you notice a speed change in the motion transmission system of the eggbeater? If you did, did the speed increase or decrease? Use your observations to explain your answer.

_____

_____

_____

2. Calculate the relationship between the number of teeth on the large gear and the number of teeth on each small gear.

Ratio:

$$\frac{\text{Number of teeth on large gear}}{\text{Number of teeth on each small gear}} =$$

Compare this ratio with the number of full turns the marked small gear makes during one full turn by the large gear.

_____

_____

Name: _____ Group: _____ Date: _____

3. Complete the following sentence based on your observations.

In a simple gear system, the greater the number of teeth a gear has, the _____. will be its rotational speed. This means that the rotational speed of each gear in the system depends on the _____ on each gear.

4. What is the advantage of having a system that allows for speed change in a manual eggbeater?

_____

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