

Teachers' Guide

Objectives of the lesson

- Students describe how the motion is transmitted in their building
- Students are able to adjust the speed of their building with appropriate gear linkage
- Development of fine mobility skills
- Students cooperate with each other
- Students develop their creativity and critical thinking skills to solve a problem they are given

Introduction to the activity

The activity starts with an introduction to gears, to repeat some basic concepts you have seen in previous lessons. You refer to the rotation and the revolution and the difference between them, to end up to the mill of a fair, that is the topic of the building. Discuss about the pictures and let your students express themselves and describe their experiences from the mills they've been to.

Simple Machine

The simple machine you use in this activity is the gear. You refer to the meshing of gears, the transmission of motion, and the speed of the motion. You mention about the driver and the driven gear and the direction of the motion of the meshing gears.

Building

Follow the instructions to complete the building. There is no difficulty on it. Beware not to turn the crank with a high speed, because the two wagons will block.

Answers to the worksheet

1. In order: crank – small gear – big gear – small gear
2. The crank rotates at the same speed with the wagons (gears ratio: $1/5 * 5/1 = 1$)
3. To reduce the speed, the gears ration needs to be lower than 1. To achieve this you have to remove the second small gear and replace it with a big gear, a middle gear (modify properly) or even nothing.
4. The gear ratio needs to be higher than 1. For example, after the crank try to place a big and a small gear.
5. You need to add weight at the base of the mill. Try to use the weight brick.