

Within this Module, you will be exploring simple machines. The goal is to create an understanding of how they function and can be utilized in creating larger complex machines. We are looking for the ability to use and create each simple machine individually and then combine them to generate a sequence of actions for

a desired outcome. After this module people of all ages and backgrounds could apply an accessible basic knowledge of simple mechanics. The base design and method you choose for assembly are completely up to you. If you need inspiration, we have provided a few different examples below and a kit of parts that can be expanded upon if you choose.

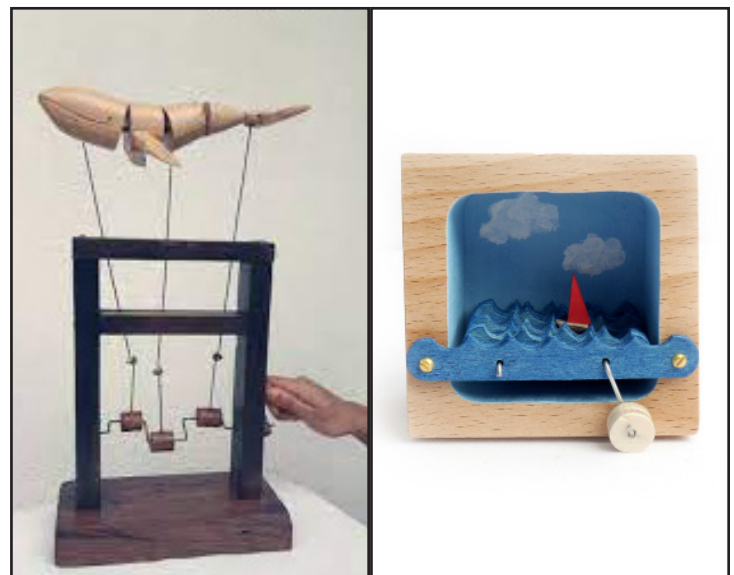
Overview

A1. In the first assignment, you will gain a foundation in basic movements from Keisuke Saka. Readings are from the book called *Karakuri: How to Make Mechanical Paper Models That Move*. By duplicating a few examples in the book, you will gain a better understanding of how simple machines function. The simple mechanisms outlined in this resource include:

- **Lever:** multiplies an applied mechanical force or can change the direction of a force
- **Crank:** converts a rotation into a linear motion, or vice versa
- **Linkage:** connections between simple machines to create more complex movement
- **Shaft:** a rod that provides support to other parts
- **Bearing:** the aperture that a shaft goes through
- **Cam:** turns or moves variously shaped disks in order to change the direction or rhythm of how parts move along the contour of those disks
- **Drivers:** a rotary connection that can provide a change of angle or direction of movement
- **Gears:** allows change of direction of rotation, speed, amount of force, and when combined with other parts can carry a force of a distance

A2. Once you gain a basic understanding of the functionality of simple mechanisms and how to create them, you will move on to learning how to apply these principles to future work. You will do this by taking a 2D or 3D design and prototyping a series of actions that create movement with that object. A kit of laser cut parts will be provided to help kick-start the process.

A3. After you have generated some prototype machines you will then combine the chosen designs to make a single complex machine with various actions and movements that successfully demonstrate the desired outcomes.



Complex Machine Examples