

**Unit guiding question:** What is the purpose of a mechanism?

**The threshold concept that is truly essential to enable you to access future learning is ...**

Mechanisms convert one type of motion into another.

Understand different types of motion and what mechanisms are used to convert them from one to another.

Understanding that there are inputs processes and outputs for every mechanical system.



**There are 4 types of motion**

**Linear motion**

The walker goes along in a straight line.



**Reciprocating motion**

The weightlifter lifts the weights up and lowers them. He does work in both directions.



**Rotary motion**

A person cartwheeling

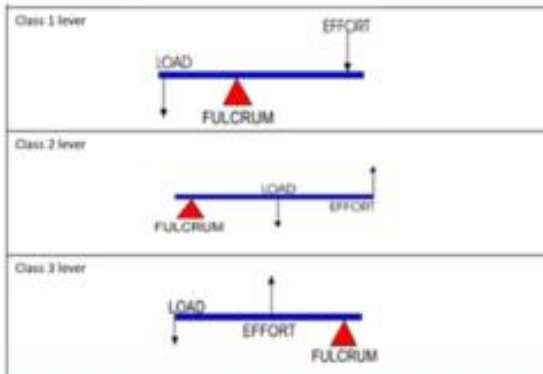


**Oscillating motion**

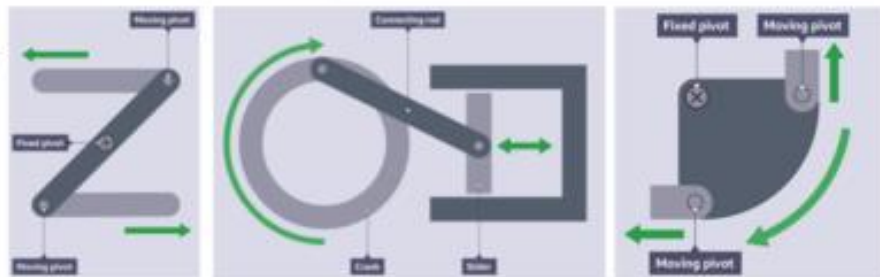
The footballer's leg swings back and forth. Only the first half of the action performs work.



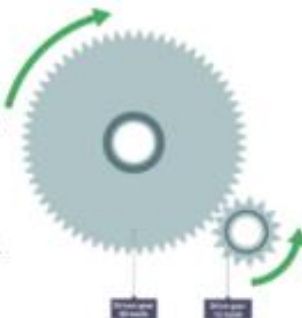
**Levers** are simple machines. There are 3 classes of lever determined by where the load, effort and fulcrum are positioned.



Some mechanisms are combinations of levers linked together. These are called linkages. They convert one type of motion into another.



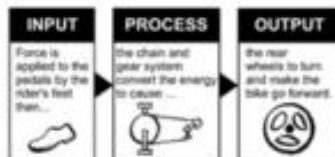
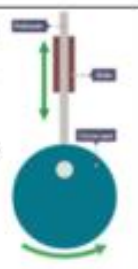
**Gears** are wheels with teeth around the outside. When several wheels are interlocked, they can transfer motion from one place to another and can change the speed and direction of the output.



**Cam mechanisms** have two main parts:

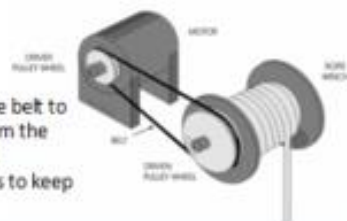
a **cam** - attached to a crankshaft, which rotates.

a **follower** - touches the cam and follows the shape, moving up and down



Systems diagram for a bike as a mechanism

**Pulley and belt systems** use the belt to transmit motion and power from the driver shaft to the driven shaft. The pulley wheels have grooves to keep the band or belt in place.





**Threshold Concept:**

**A variety of food is needed in the diet because different food contains different nutrients. Different types of food provide different amounts of energy and to be healthy, energy balance should be achieved.**



The Eatwell Guide is the UK healthy eating model. Healthy eating is all about balance, meaning that there are no good or bad foods and all foods can be included in a healthy diet as long as the overall balance of foods is right. Choosing a variety of different foods from the 5 main food groups helps us eat a wide range of nutrients.

**Threshold Concept:**

**Different types of food provide different amounts of energy and to be healthy, energy balance should be achieved.**

To maintain body weight it is necessary to balance energy intake (from food and drink) with energy expenditure (from activity). This is called energy balance. When energy intake is higher than energy output, over time this will lead to weight gain (positive energy balance). When energy intake is lower than energy output, over time this will lead to weight loss (negative energy balance).



**Threshold Concept:**

**Different types of food are grown, reared or caught.**

Plants are grown for food and might be grown on farms, allotments, in gardens or on windowsills. Animals are reared for food on farms in fields and sheds. Some animals, like fish, are caught for food. Fishing usually takes place in the sea, rivers or lakes.



**Threshold Concept:**

**Food can spoil and decay due to the action of micro-organisms (microbes), insects and other pests and that food needs to be stored properly and within its date mark.**



A use-by date on food is about safety. You can eat food until and on the use-by date but not after. For the use-by date to be a valid guide, you must carefully follow storage instructions. After the use-by date, don't eat, cook or freeze your food. The food could be unsafe to eat or drink, even if it has been stored correctly and looks and smells fine.

**Threshold Concept:**

**Plant-based alternatives to meat and dairy products and locally grown, seasonal foods have a lower impact on the environment.**

Meat and dairy (farmed livestock) accounts for 14.5% of all manmade greenhouse gas emissions. That's roughly equivalent to the exhaust emissions of every car, train, ship and aircraft on the planet! If we all plant-based alternatives to meat and dairy products, the world's food-related emissions would drop 70% by 2050. Food transport, packaging and processing make up 6% of CO2e emissions from rich countries. Local, seasonal food means lower emissions

