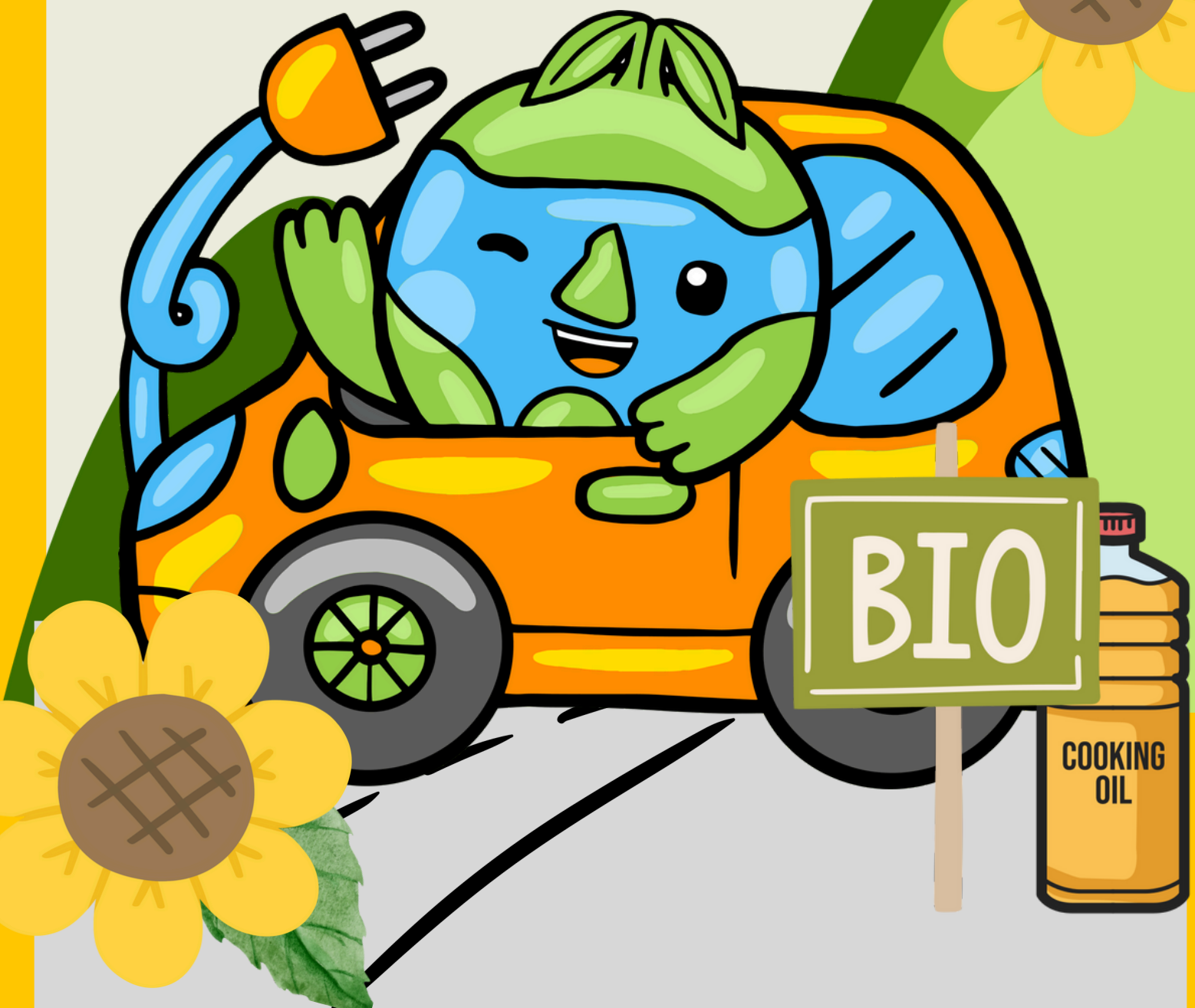


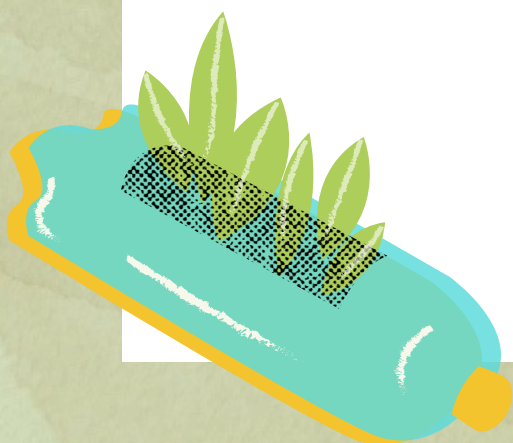
# Biodiesel



Name: \_\_\_\_\_ Class: \_\_\_\_\_ Student No.: \_\_\_\_\_



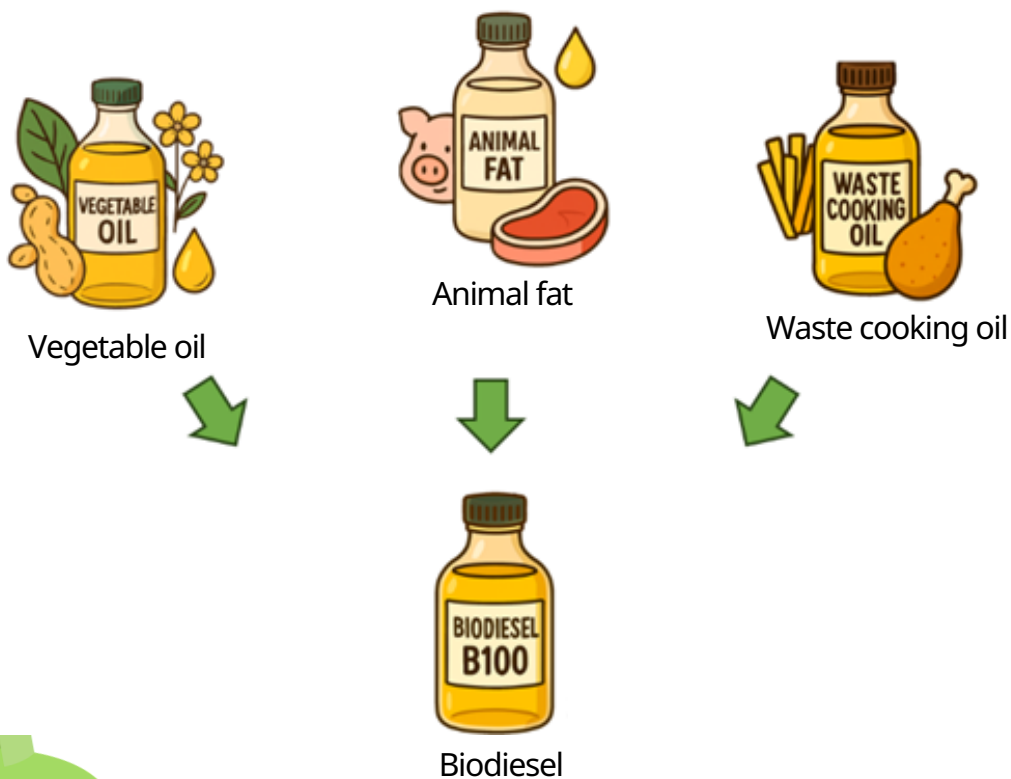
As global warming and climate issues become increasingly severe, countries around the world are actively seeking alternatives to fossil fuels and promoting the development of renewable energy to reduce greenhouse gas emissions. The use of biofuels has flourished in many nations, utilising plant and animal fats to produce energy.



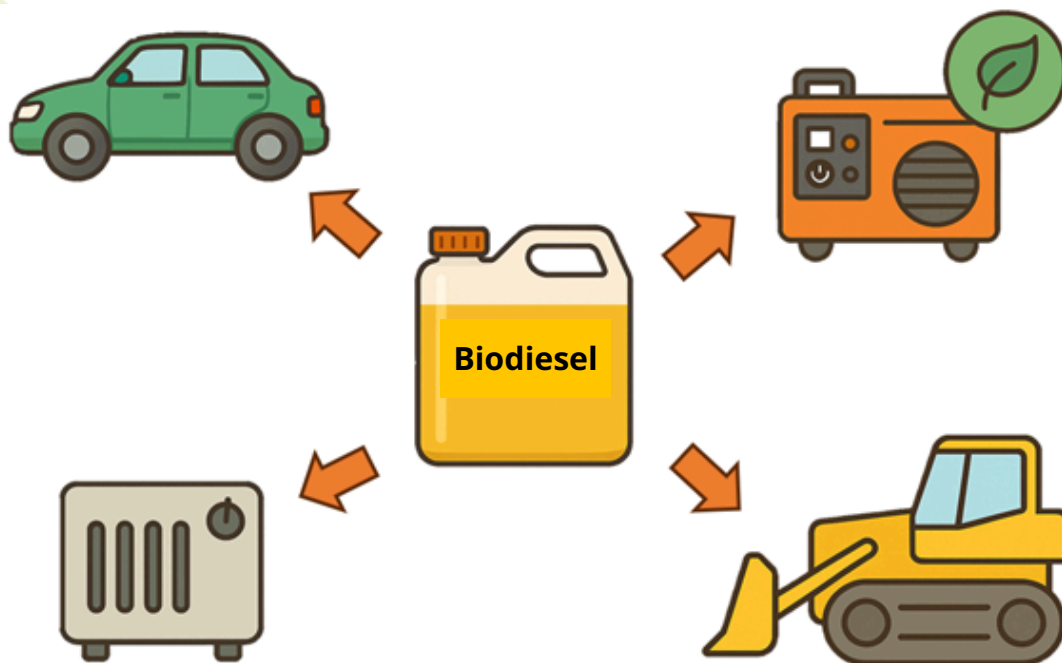
# What is Biodiesel?

Biodiesel is a type of renewable fuel primarily made through a chemical process called Transesterification, using vegetable oils (such as soybean oil and rapeseed oil), animal fats or waste cooking oil.

This biofuel, derived from oils and fats, can be used in diesel engines and is more environmentally friendly compared to traditional petroleum diesel.







In Hong Kong, the government has actively promoted the conversion of waste oil into Biodiesel in recent years, aiming to partially replace conventional diesel. This initiative seeks to reduce greenhouse gas emissions, improve air quality, and contribute to sustainable development.





How can Biodiesel be used? Try to draw the facility you designed that uses Biodiesel and briefly explain it.



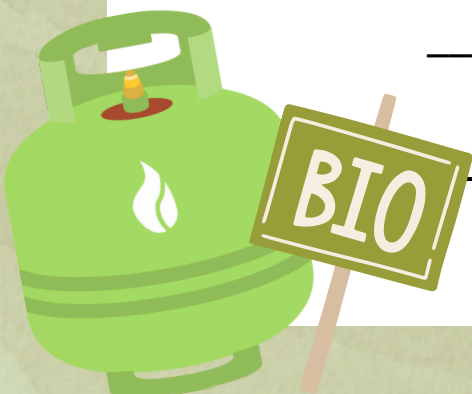
My designed Biodiesel-using facility is

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Explanation:

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## Test your knowledge



1. What is Biodiesel?

- ☐A. A type of drinkable juice
- ☐B. A type of fuel made from plant or animal oils
- ☐C. A toy
- ☐D. A type of candy

2. What are the benefits of Biodiesel for the Earth?

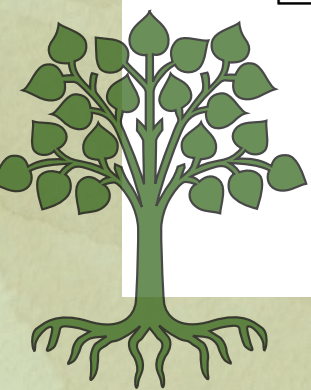
- ☐A. Makes the air cleaner
- ☐B. Turns water into oil
- ☐C. Makes cars fly
- ☐D. Stops plants from growing

3. What is Biodiesel made from?

- ☐A. Vegetable oil and animal oil
- ☐B. Rocks and sand
- ☐C. Paper and wood
- ☐D. Candy and chocolate

4. Why do some people not use Biodiesel often?

- ☐A. Because it's too cheap
- ☐B. Because it's very useful
- ☐C. Because it's more expensive
- ☐D. Because it will turns into water





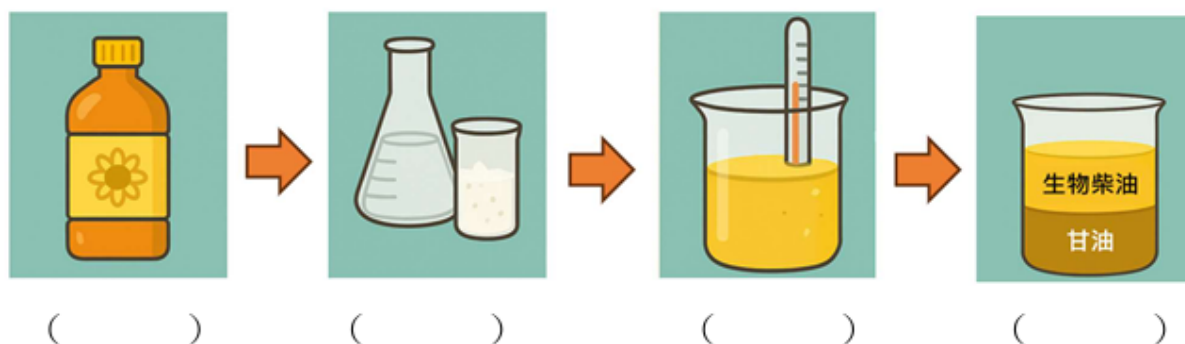
Identify whether each statement is an Advantage or a Disadvantage:

	Advantage	Disadvantage
1. The carbon dioxide and harmful gases produced when biodiesel is burned are less than those from petroleum diesel.		
2. The raw materials can be continuously cultivated or recycled.		
3. It tends to solidify in cold climates, affecting fuel flow and engine start-up performance.		
4. Biodiesel is more biodegradable than petroleum products, resulting in less environmental impact.		
5. Biodiesel is prone to oxidation and degradation, so antioxidants need to be added to stabilise its quality.		
6. Most diesel vehicles can directly use blended Biodiesel.		



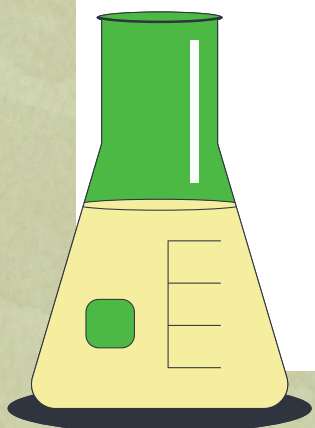
Please place the steps of the Biodiesel production process in order under the corresponding diagram.

- A. Mix alcohol and catalyst
- B. Heat vegetable oil and carry out Transesterification
- C. Separation of the mixture
- D. Prepare raw materials



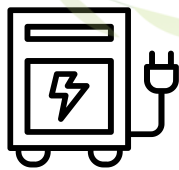
### Safety Reminder

- The production process involves methanol and strong alkalis, which are corrosive and toxic. It must be carried out in a well-ventilated environment equipped with proper safety equipment.
- It is not recommended to attempt this production process at home, especially for minors. Professional supervision is required.



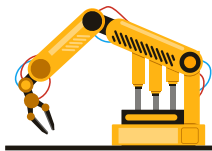
Please match the following images with the corresponding uses of Biodiesel:

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**Power Generation Equipment**

- Can be directly used in diesel vehicles or blended with petroleum diesel



**Industrial Machinery**

- Can be used in diesel generators to provide clean electricity



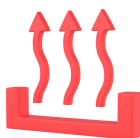
**Environmental Additives**

- In some regions, Biodiesel is used as a substitute for heating fuel



**Transportation**

- Geological, mining, and agricultural equipment can also use Biodiesel



**Heating Systems**

- Improves combustion efficiency and reduces exhaust emissions

## Green Innovation Challenge

Try to design an eco-friendly poster that promotes the benefits of using Biodiesel and encourages recycling of waste oil.

