Materials Theory

Plastics

Name _____

Technology group _____

Plastics/Polymers

Thermo Plastics

_____

_____

_____

Thermosetting Plastics

_____

_____

_____

How are plastics made?

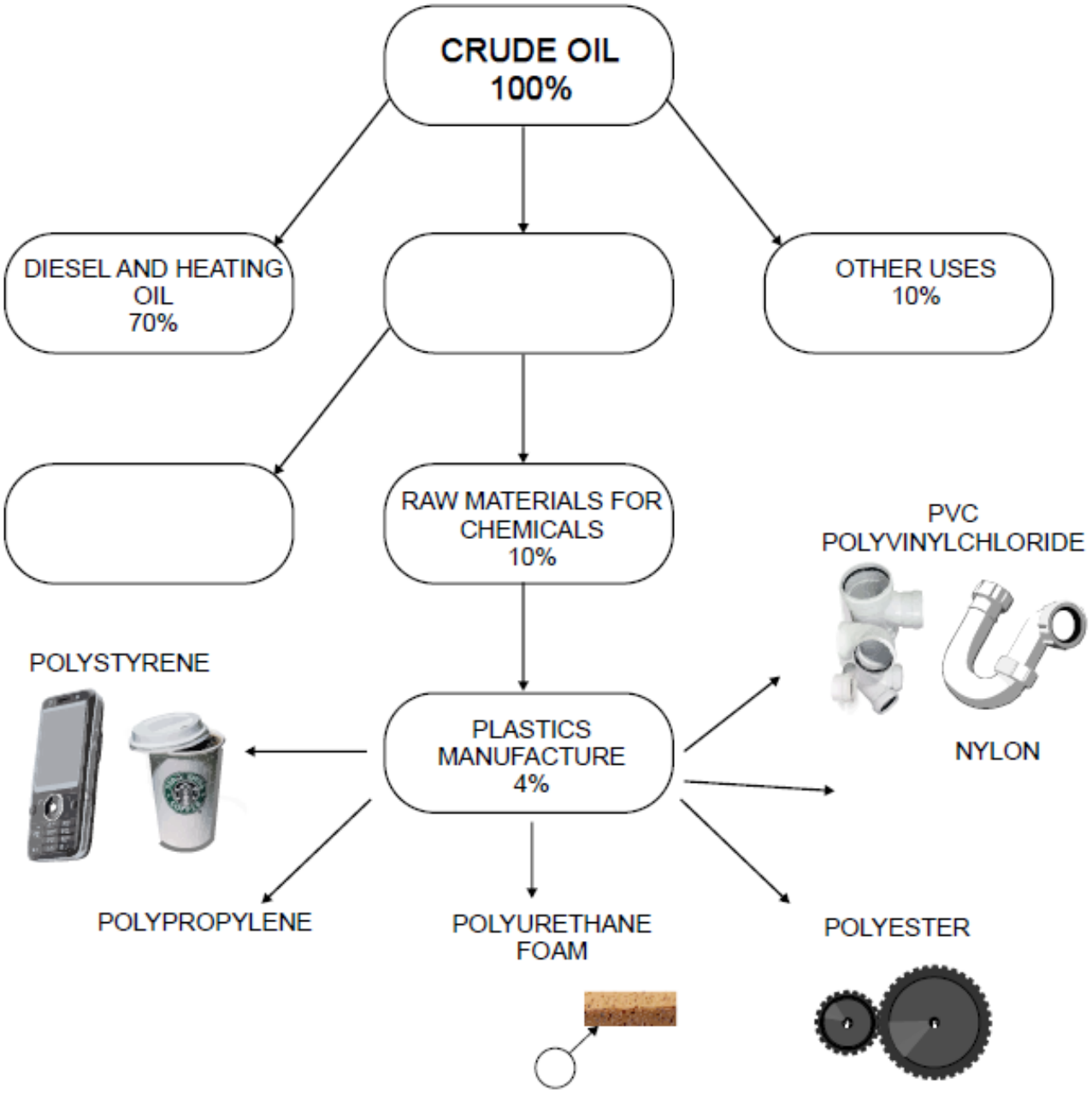
Oil refineries 'refine' oil in massive quantities, to produce the fuels we need. These include diesel, petrol and heating oil. However, some of the raw materials we need to manufacture plastics, are also extracted from oil at the refinery. When crude oil is refined, four percent ends up as raw materials for the production of plastics.

1. Complete the following paragraph, by adding the missing words:

Oil is used widely for the production of _____ as it is composed of _____ and hydrogen. This is why oil is called a _____. Oil and natural gas are the most important raw materials for plastics manufacture. To the plastics industry, _____ is the most important _____ distilled from crude oil. It is used in the production of a range of plastics.

PLASTICS HYDROCARBON NAPHTHA CARBON FRACTION

2. Complete the diagram below, by adding the missing information and appropriate sketches representing plastic products.



Complete the diagram representing the extraction of crude oil and its processing to fuel and other products. Add missing diagrams and text.

OIL FIELD

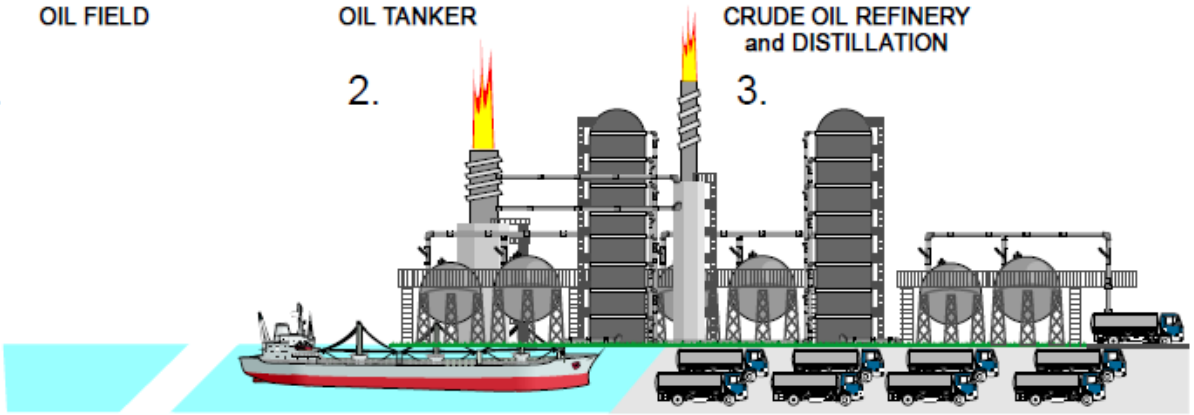
1.

OIL TANKER

2.

CRUDE OIL REFINERY and DISTILLATION

3.

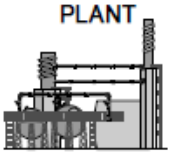


DISTRIBUTION

4.

NAPHTHA / PLASTICS PROCESSING PLANT

5.



PETROL STATIONS

DOMESTIC HEATING

PLASTIC GRANULES

6.

FACTORY

7.

PRODUCTS

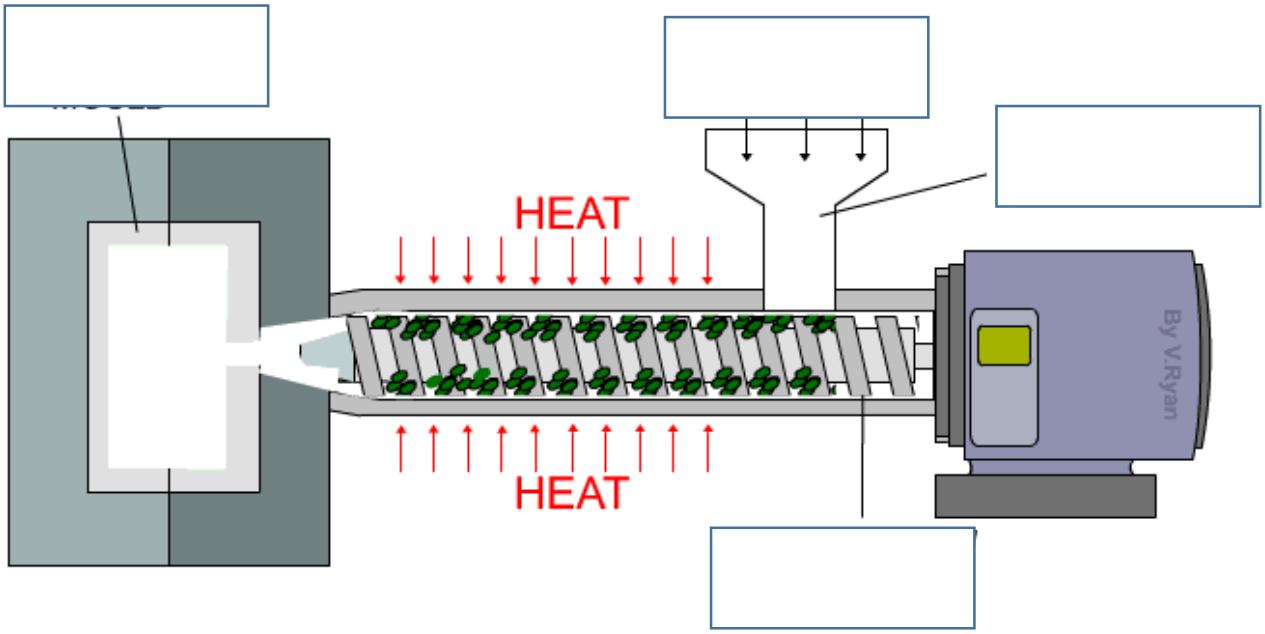
8.

PVC
POLYVINYLCHLORIDE

NYLON

POLYPROPYLENE

Injection moulding



Notes

_____

_____

_____

_____

_____

_____

_____

_____

_____

Vacuum forming

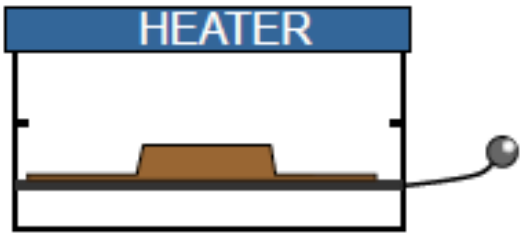
Add the missing text or missing diagram, to complete the information sheet below.

The first stage of vacuum forming is to manufacture a precise mould. This is a skilled job as any imperfections to the mould will show up every time it is used to form plastic such as high density polystyrene.
The mould can be used hundreds and even thousands of times to produce the same plastic part. Each part will be exactly the same.

1.

A SUITABLE MOULD / FORMER IS CAREFULLY MANUFACTURED

2.

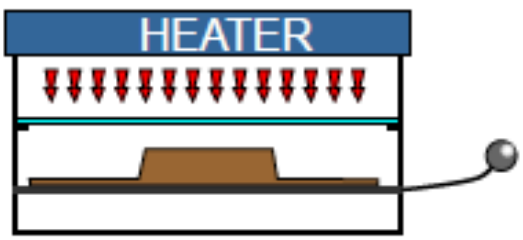


THE MOULD IS PLACED IN THE VACUUM FORMER

3.

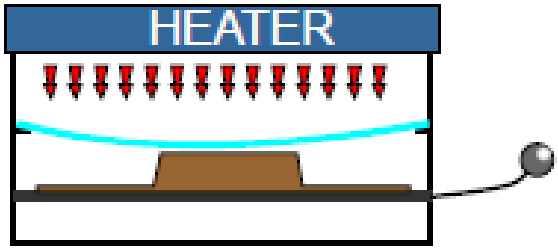
A sheet of high density polystyrene is paced above the mould and clamped in position. Various thicknesses are available. Usually material 1mm thick is the most suitable for this type of vacuum forming.

4.



THE ELECTRIC HEATER IS TURNED ON TO WARM THE PLASTIC SHEET.

5.



THE PLASTIC BECOMES FLEXIBLE WHEN HEATED

6.

When the polystyrene is ready the shelf is then lifted up towards the polystyrene sheet. The air underneath the former is pumped out and the polystyrene takes the form of the mould.