

# 6.2 REFINERY CARD SORT

## How does a refinery work?

### MATERIALS

- Cracking/Distillation Tower drawing
- Refinery Cards
- Scissors

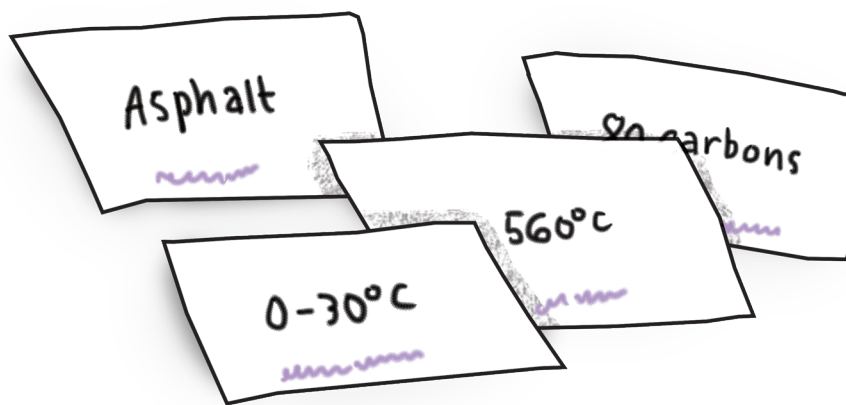
### DIRECTIONS

1. Distribute copies of the cracking/distillation tower and refinery cards. Instruct students to cut cards out.
2. Use the distillation tower drawing as a template for arranging the cards.
3. Have students check with teacher to see if the proper order and products matched.

### REFLECTION

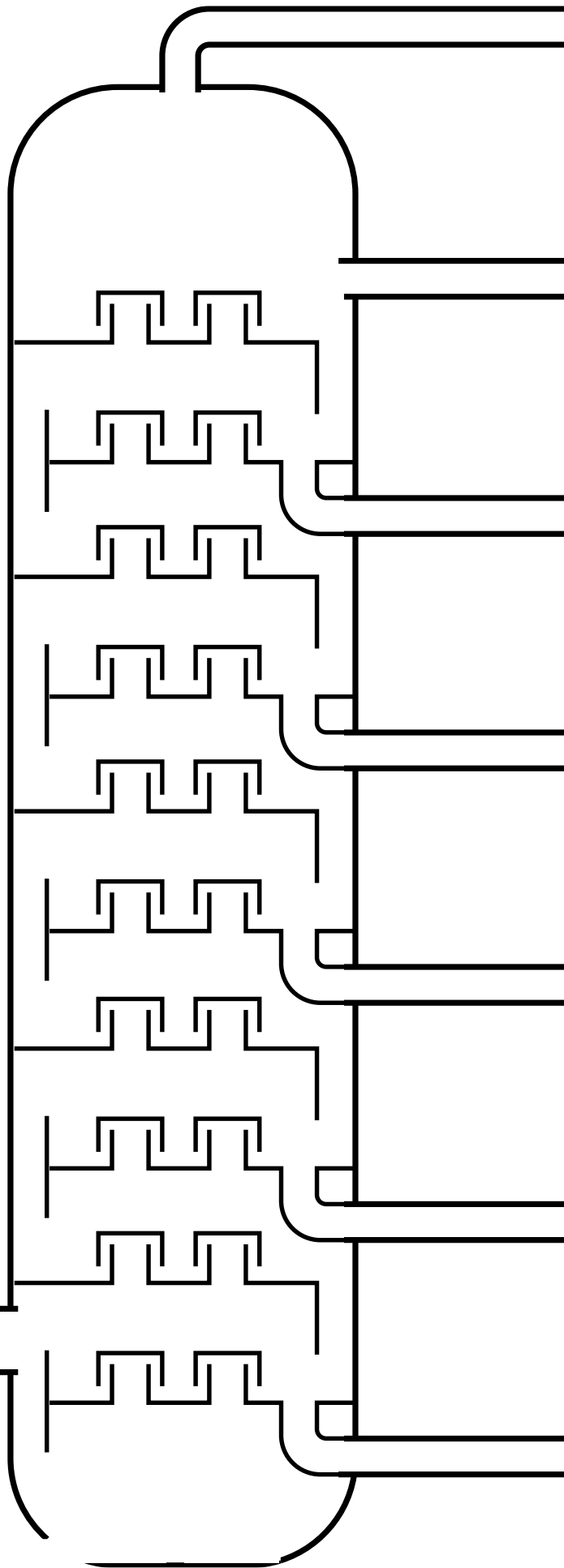
1. What is the relationship between the number of carbons and the boiling point?
2. Where would you expect to find both the highest boiling point and the lowest boiling point in the cracking/distillation tower?
3. In general, what differences do you see among the end products and their location in the cracking/distillation tower?

Cracking tower product	Number of carbons	Boiling point	End product
Light gas	1–4	0–30 °C	Bottled and natural gas, propane and butane
Naphtha	5–10	30–180 °C	Gasoline
Kerosenes	10–16	180–260 °C	Kerosene for home heaters, jet fuel
Gas oils	16–60	260–350 °C	Diesel fuel, feedstock for cracking
Lubricants	> 60	350–575 °C	Motor oils
Fuel oil	> 70	> 490 °C	Candles, fuel oil for ships and power stations
Asphalt	> 80	> 580 °C	Roofing tar, road tar



↑  
fractions  
decreasing in  
density and  
boiling point

crude oil →



Cracking tower product

Cracking tower product

Cracking tower product

Cracking tower product

Cracking tower product

Cracking tower product

Cracking tower product

Number of carbons	Boiling point	End product
Number of carbons	Boiling point	End product
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<b>1–4 carbons</b>	<b>Light gas</b>	<b>Naphtha</b>	<b>&gt; 490 °C</b>
Number of carbons	Cracking tower product	Cracking tower product	Boiling point
<b>350–575 °C</b>	<b>0–30 °C</b>	<b>Bottled and natural gas, Propane and Butane</b>	<b>Gasoline</b>
Boiling point	Boiling point	End product	End product
<b>Diesel fuel, feedstock for cracking</b>	<b>5–10 carbons</b>	<b>Asphalt</b>	<b>16–60 carbons</b>
End product	Number of carbons	Cracking tower product	Number of carbons
<b>Gas oils</b>	<b>30–180 °C</b>	<b>&gt; 60 carbons</b>	<b>Motor oils</b>
Cracking tower product	Boiling point	Number of carbons	End product
<b>10–16 carbons</b>	<b>&gt; 70 carbons</b>	<b>Kerosene for home heaters, jet fuel</b>	<b>260–350 °C</b>
Number of carbons	Number of carbons	End product	Boiling point
<b>180–260 °C</b>	<b>Fuel oil</b>	<b>Roofing tar, road tar</b>	<b>Lubricants</b>
Boiling point	Cracking tower product	End product	Cracking tower product
<b>Kerosenes</b>	<b>&gt; 580 °C</b>	<b>Candles, fuel oil for ships and power stations</b>	<b>&gt; 80 carbons</b>
Cracking tower product	Boiling point	End product	Number of carbons