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FORM 5
CHEMISTRY
TEACHER HAZIQAH

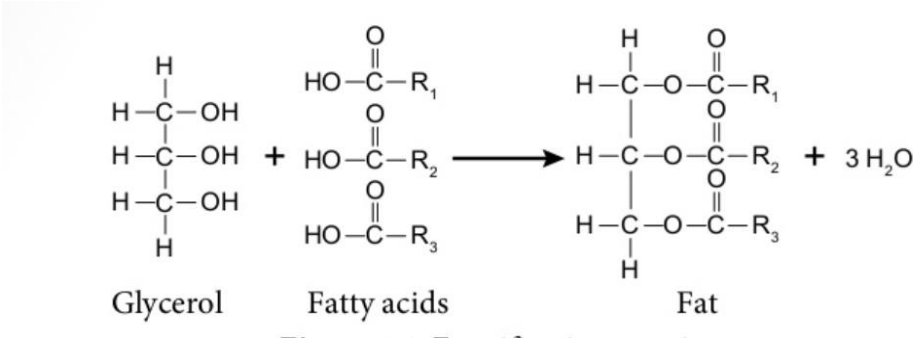
CHEMISTRY FORM 5			
NO	TOPIC	DATE	REMARKS
1	REDOX		
2	CARBON COMPOUND		
3	THERMOCHEMISTRY		
4	POLYMER		
5	CONSUMER AND INDUSTRIAL CHEM		

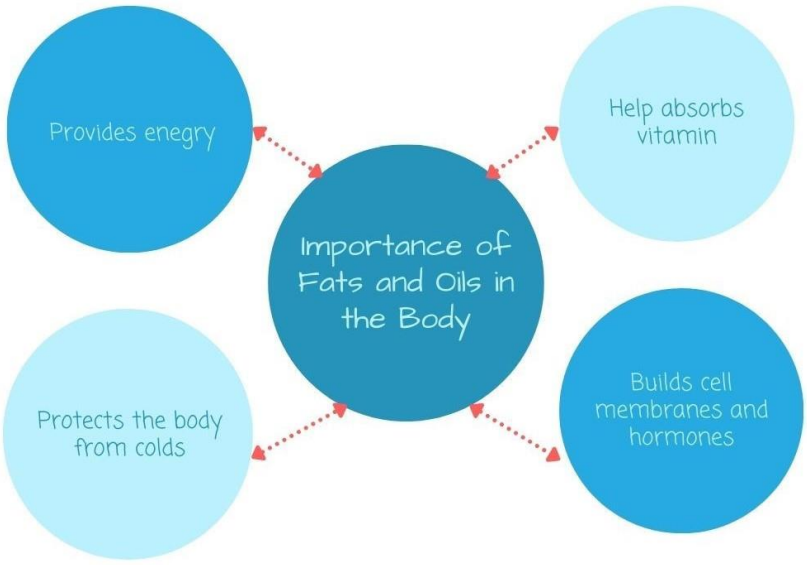
OIL AND FATS / *MINYAK DAN LEMAK*

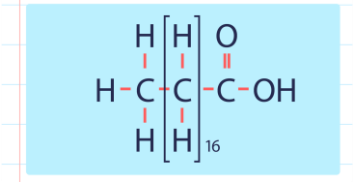
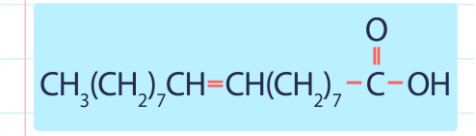
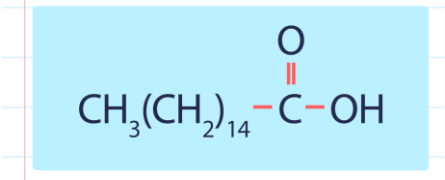
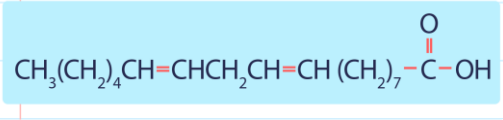
Definition of oils and Fats / *Maksud minyak dan lemak*
Esters produced through the reaction between fatty acids and glycerol (propan-1,2,3-triol). *Ester yang terhasil melalui tindak balas antara asid lemak dan gliserol (propan-1,2,3-triol)*.

The difference oils and Fats / *Perbezaan minyak dan lemak*	
Fats / *Lemak*	**Oil / *Minyak***
Solid form at room temperature *Pepejal pada suhu bilik*	Exist in liquid form at room temperature *Hadir pada cecair pada suhu bilik*
Found in meat and butter *Ditemukan dalam daging dan mentega*	Plants (Palm oil, soybean) *Diperoleh daripada tumbuhan (minyak sawit, minyak soya)*

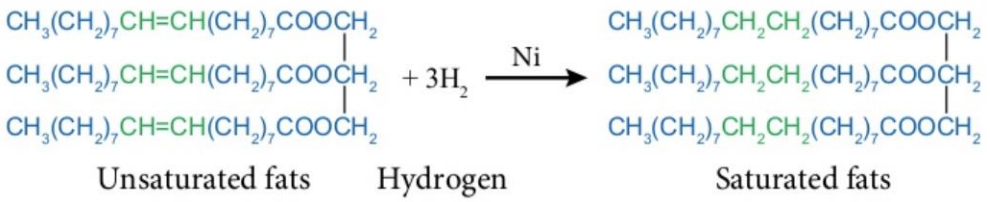
The difference oils and Fats / *Perbezaan minyak dan lemak*		
Aspek / *aspect*	**Oils / *minyak***	**Fats / *Lemak***
Source	From plants	From animals
Physical state at room temperature	Liquid *cecair*	Solid or semi - solid *Pepejal atau separa pepejal*
Melting point	Less than 20°C *Kurang daripada 20°C*	More than 2°C *Lebih daripada 2°C*
Content of fatty acids	High percentage of **unsaturated fatty acid** *Peratus tinggi lemak tak tepu*	High percentage of **saturated fatty acids** *Peratus tinggi lemak tepu*
Example	Palm oil / *Minyak sawit*	Butter / *Mentega*

Example of An Esterification Reaction between Fatty Acids with Glycerol to form Fat




Saturated fatty acid	Unsaturated fatty acid
Stearic acid 	Oleic acid 
Palmitic acid 	Linoleic acid 
Conversion of unsaturated fats to saturated fats	

- Through addition reaction with hydrogen / *melalui tindak balas penambahan dengan hidrogen*
- Also known as hydrogenation / *Juga dikenali sebagai penghidrogenan*
- Temperature 150°C to 200°C / *suhu 150°C to 200°C*
- Catalyst : nickel / *Mangkin : Nikel*



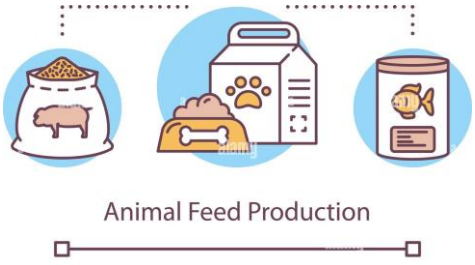
Uses of Oil and Fats in Life / *Penggunaan Minyak dan Lemak dalam Kehiduapan*

Biofuel / *Bahan Api*

Nutritional Source / *Sumber Nutrisi*

Soap and personal care / *Sabun dan bahan penjagaan diri*

Animal feed / *Makanan haiwan*



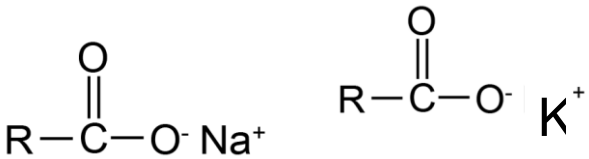
Effect of Excessive Fats toward Health

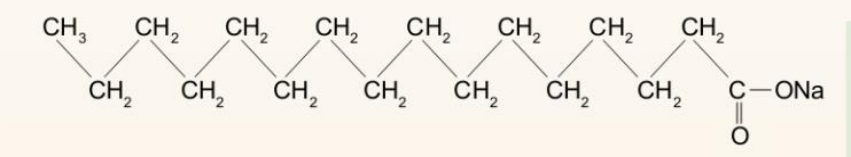
• Excessive fat is dangerous. / *Pengambilan secara berlebihan sangat bahaya*
• A high correlation between a diet rich in saturated fats with cardiovascular diseases. *Korelasi yang tinggi antara diet yang kaya dengan lemak tepu dengan penyakit kardiovaskular.*
  ○ Increasing cholesterol level in the body. *Meningkatkan paras kolestrol dalam badan.*
  ○ Cholesterol can make blood vessels harder and narrower. *Kolesterol boleh menjadikan saluran darah lebih keras dan sempit.*
  ○ Formation of plague and blocking blood flow. *Pembentukan wabak dan menyekat aliran darah.*
  ○ High blood pressure, heart attack and stroke. Darah tinggi, serangan jantung dan stroke.

CLEANING AGENT / *BAHAN PENCUCI*

SOAP

What is soap / *Apakah sabun*

Definition of Soap / *Maksud sabun*
Sodium or potassium fatty acid salts. / *Garam Natirum atau kalium bagi asid lemak* General formula / *Formula Am* $RCOO^-Na^+$ or $RCOO^-K^+$ 



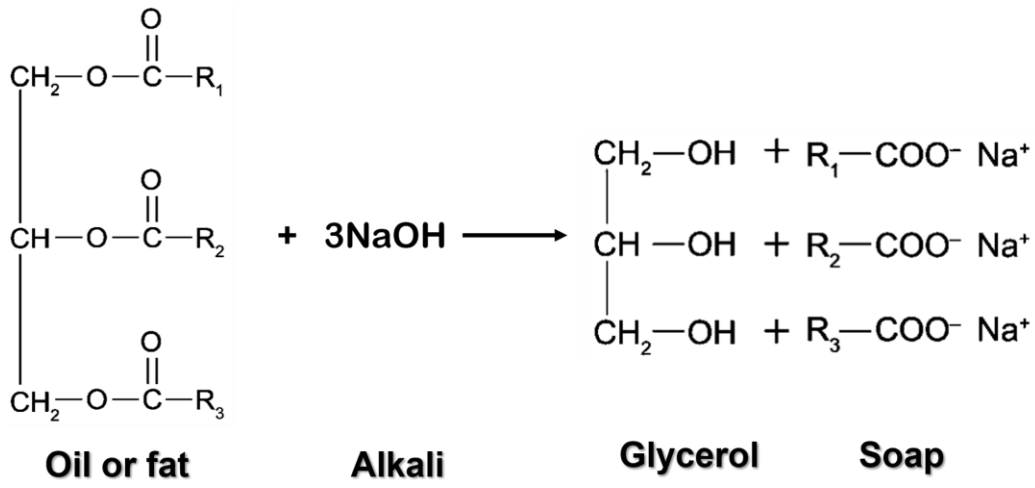
Example of soap			
Soap	Chemical formula	Fatty acid	Source
Sodium laurate	$CH_3(CH_2)_{10}COONa$	$CH_3(CH_2)_{10}COONa$ Acid laureate	Coconut oil
Sodium palmitate	$CH_3(CH_2)_{14}COONa$	$CH_3(CH_2)_{14}COONa$ Palmitate acid	Palm oil

Preparation of Soap / *Proses penyediaan sabun*

- Soaps are prepared through hydrolysis of fats or oils under alkaline condition to produce glycerol and alcohol and soap fatty acid salts
  Sabun disediakan melalui hidrolisis lemak atau minyak dalam keadaan alkali untuk menghasilkan gliserol dan alkohol dan garam asid lemak sabun
- This reaction is called saponification, which is the process of hydrolysis of oils or fats by alkali.
- *Tindak balas ini dipanggil saponifikasi, iaitu proses hidrolisis minyak atau lemak oleh alkali.*
- Sources of / *sumber daripada*
  - Fat : Cows and goats
  - Oils : Palm Oil, olive oil, coconut oil
- Strong Alkali : NaOH or KOH

General Equation of Saponification Reaction

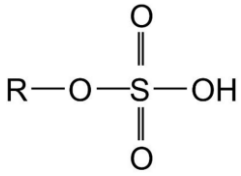
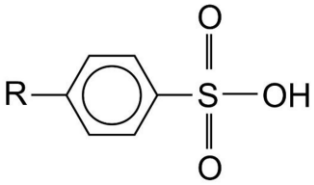
Oil/Fat + Concentrated alkali → Soap + Glycerol



DETERGENT / *DETERGEN*

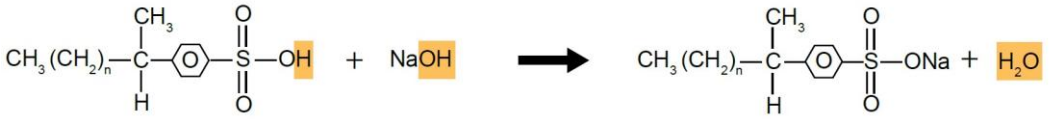
What is detergent / *Apakah detergen*

Definition of detergent / *Maksud detergen*
Sodium salts of sulfonic acids / *Garam natrium asid sulfonik* Raw material / *bahan mentah* Petroleum Non soap cleaning agents / bahan pencuci yang *bukan sabun* Detergents are usually made from petroleum fractions / *Detergen biasanya dibuat daripada pecahan petroleum* Produced from two types of sulphonic acid / *Dihasilkan daripada dua jenis asid sulfonik*

Example of detergent / *contoh detergen*	
Alkyl Sulphonic Acid	**Alkylbenzene Sulphonic Acid**
	

Preparation of detergent / *Penyediaan detergen*
● Detergents are usually made from petroleum fractions and sulphuric acid, H_2SO_4 *Detergen biasanya dibuat daripada pecahan petroleum dan asid sulfurik.* H_2SO_4 ● They are produced through two processes which are: Ia dihasilkan melalui dua proses iaitu ○ Sulphonation / *Sulfonasi* ○ Neutralisation / *peneutralan*

Preparation of Sodium Alkylbenzene Sulphonate
Sulphonification of alkylbenzene / *sulfonasi alkilbenzene*
Alkylbenzene reacts with concentrated sulphuric acid, H_2SO_4 to form alkylbenzene sulphonic acid.  Alkylbenzene Sulphuric acid Alkylbenzene sulphonic acid Water

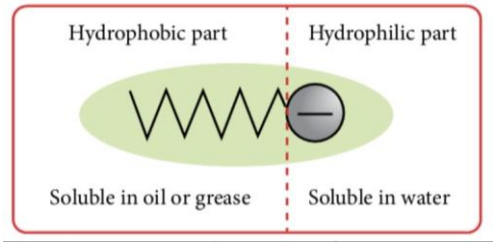
Preparation of Sodium Alkylbenzene Sulphonate
Neutralization / *peneutralan*
Alkyl Benzene sulphonic acid will be neutralised by sodium hydroxide, NaOH solution to produce alkyl benzene sulphonate salt, which is detergent.  Alkylbenzene sulphonic acid Sodium hydroxide Sodium alkylbenzene sulphonate Water

Preparation of Sodium Alkyl Sulphate
Sulphonification of alcohol / *sulfonasi alkohol*
Long chain alcohol reacts with concentrated sulphuric acid, H_2SO_4 to form alkyl sulphonic acid to form alkyl sulphonic acid.

Preparation of Sodium Alkyl Sulphate
Sulphonification of alcohol / *sulfonasi alkohol*
Alkyl sulphonic acid will be neutralised by sodium hydroxide, NaOH solution to produce sodium alkyl sulphate, which is detergent.

CLEANSING ACTION OF SOAP AND DETERGENT / *TINDAKAN PENCUCIAN SABUN DAN DETERGEN*

- Soap & detergent act as emulsifying agents
  Sabun & detergen bertindak sebagai agen pengemulsi
- Soap and detergent molecules are soluble in oil or grease and water
  Molekul sabun dan detergen larut dalam minyak atau gris dan air



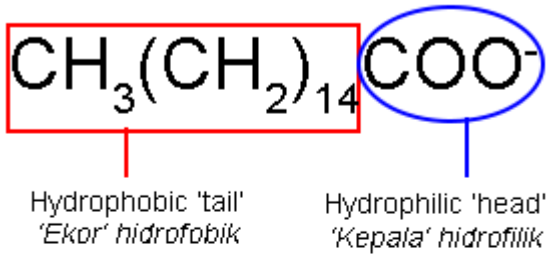
Equation for ionisation of soap and detergent

Soap $\xrightarrow{\text{Water}}$ Soap anion + Sodium ion

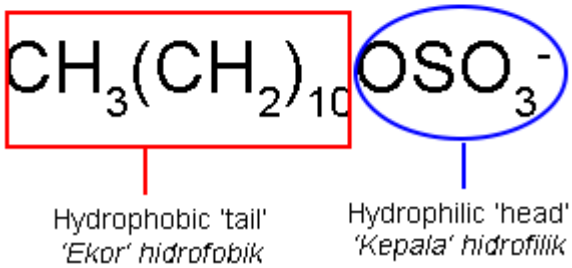
Detergent $\xrightarrow{\text{Water}}$ Detergent anion + Sodium ion

Structural Formula for Soap Anion and Detergent Anion

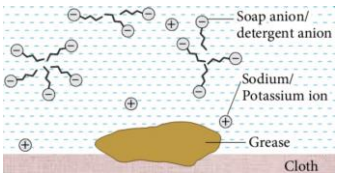
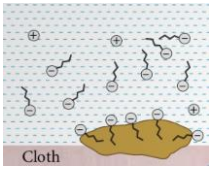
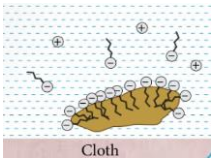
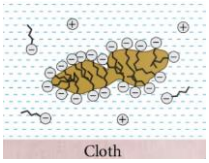
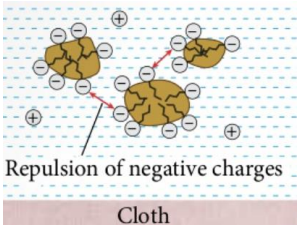
Soap anion in water
Anion sabun dalam air



Detergent anion in water
Anion detergen dalam air



HOW CLEANSING ACTION OF SOAP AND DETERGENT / *BAGAIMANA TINDAKAN PENCUCI SABUN DAN DETERGEN*

Step / *Langkah*	**Explanation / *penerangan***	
1.	Adding soap or detergent into water to reduce the surface tension of water and increase water's ability to wet the surface of cloth *Menambah sabun atau detergen ke dalam air untuk mengurangkan ketegangan permukaan air dan meningkatkan keupayaan air untuk membasahi permukaan kain*	
2.	Soap or detergent will ionise in water to produce free moving soap anions or detergent anions. *Sabun atau detergen akan mengion dalam air untuk menghasilkan anion sabun atau anion detergen yang bergerak bebas.*	
3.	The hydrophilic parts of soap anions or detergent anions dissolve in water and the hydrophobic parts dissolve in grease. *Bahagian hidrofilik anion sabun atau anion detergen larut dalam air dan bahagian hidrofobik larut dalam gris*	
4.	Movement of water during scrubbing and agitation causes grease to pull away from the surface of the cloth. *Pergerakan air semasa menggosok dan mengaduk menyebabkan gris terkeluar dari permukaan kain.*	
5.	The hydrophilic parts of soap anions or detergent anions surround the grease then floats to the surface of the water. *Bahagian hidrofilik anion sabun atau anion detergen mengelilingi gris kemudian terapung ke permukaan air.*	
6.	Grease breaks into small droplets. Small droplets will not reattach to the surface of the cloth due to the repulsion of negative charges of the hydrophilic parts on the surface of the grease. The droplets forming an emulsion. Rinsing with water causes the surface of the cloth to become clean because the grease droplets are left in the water. *Gris pecah menjadi titisan kecil. Titisan kecil tidak akan melekat semula pada permukaan kain kerana tolakan cas negatif bahagian hidrofilik pada permukaan gris. Titisan membentuk emulsi.* *Bilas dengan air menyebabkan permukaan kain menjadi bersih kerana titisan gris tertinggal di dalam air.*	

Comparison of Cleansing Action of Soap and Detergent / *Perbandingan Tindakan Pembersihan Sabun dan Detergen*

Water containing calcium ions Ca^{2+} and magnesium ions, Mg^{2+} is called **hard water.**
*Air yang mengandungi ion kalsium Ca2+ dan ion magnesium, Mg2+ dipanggil **air liat**.*

$$2CH_3(CH_2)_{16}COO^-(aq) + Ca^{2+}(aq) \rightarrow [CH_3(CH_2)_{16}COO]_2Ca(s)$$

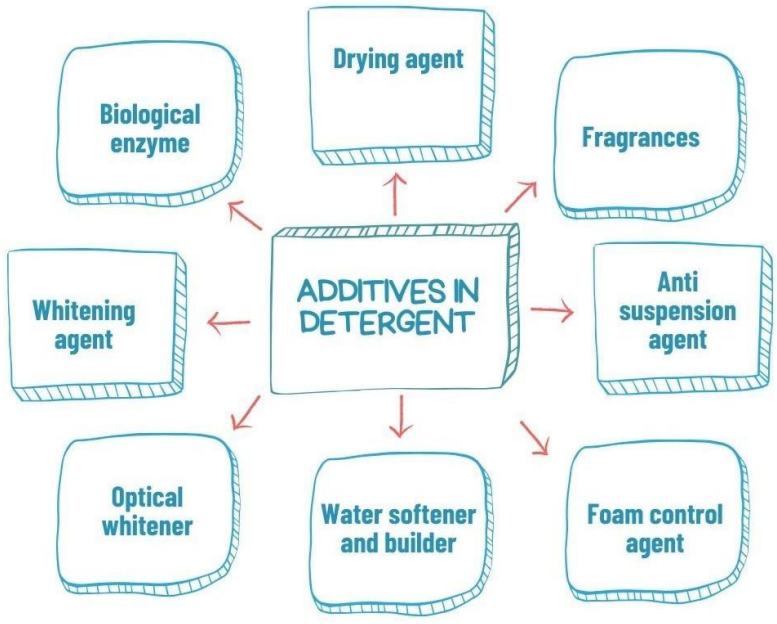
Stearate ion — Calcium ion — Calcium stearate (scum)

$$2CH_3(CH_2)_{16}COO^-(aq) + Mg^{2+}(aq) \rightarrow [CH_3(CH_2)_{16}COO]_2Mg(s)$$

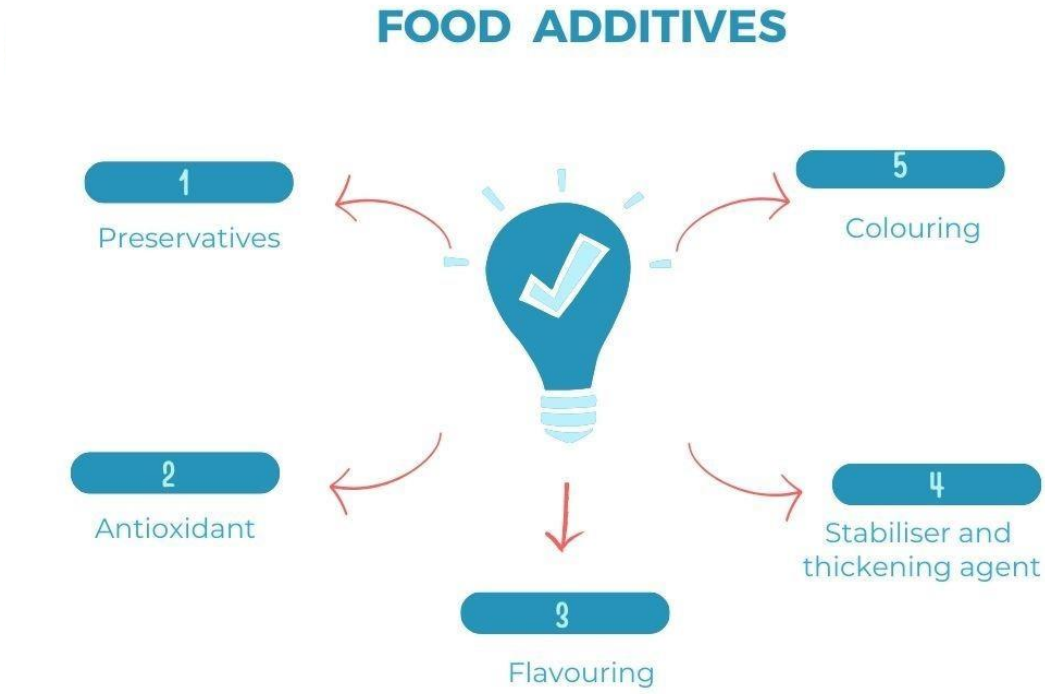
Stearate ion — Magnesium ion — Magnesium stearate (scum)

The formation of scum causes wastage of soap because more soap will be needed for the cleansing action.
Pembentukan buih menyebabkan pembaziran sabun kerana lebih banyak sabun akan diperlukan untuk tindakan pembersihan.

Aspect	Soap	Detergent
Effectiveness in soft water	Effective	Effective
Effectiveness in hard water	Less Effective	Less Effective
Effectiveness in acidic water	No Effective due to the formation of insoluble organic acid	Effective due to organic acid formed is soluble



FOOD ADDITIVES



Food additives	Functions	Examples
Preservatives	Slow down or inhibit the food from being rot	Sodium nitrite Sodium benzoate
Antioxidant	Slows down the oxidation by oxygen in the air.	Ascorbic acid
Flavouring	Improve the taste or smell of the food.	Monosodium glutamate aspartame
Stabiliser and thickening agent	To give a smooth and uniform texture to the food.	Gelatine Acacia gum
Colouring	Replace the faded colour of food or colours the food to improve the appearance and taste of food	Azo compound Triphenyl compound

MEDICINE AND COSMETICS

MEDICINE - Chemical used to help with treatment or prevention of disease				
Traditional		**Modern**		
Ginseng	Improves health.	Analgesic	Relieve pain in conscious state	**Example**
Tamarind	The juice from its fruit can relieve cough.			Aspirin Paracetamol Codein
Garlic	Lessen infection and high blood pressure.	Antibiotics	Relieves pain, alleviates coughs and treats diarrhea.	Codein
Cloves	Relieves toothache.			
Sirih leaves	Relieves eyesore.			
Turmeric	Decreases pimples.			
Papaya tree	The juice can relieve skin irritation.	Psychotic drugs	Stimulant Stimulate and activate brain, body and emotional activity.	Amfetamine Fenilpropanolamine
Hibiscus tree	The leaves can relieve headache and decrease hair loss.		Antidepressant Treating depression	Imipramine amtriptiline
Coconut tree	The coconut water can reduce fever.		Antipsychotic Tranquiliser	
Aloe vera	The juice can reduce the pain from burned skin			

COSMETICS - substances or products used externally for cleaning, protect or beautify one's appearance.

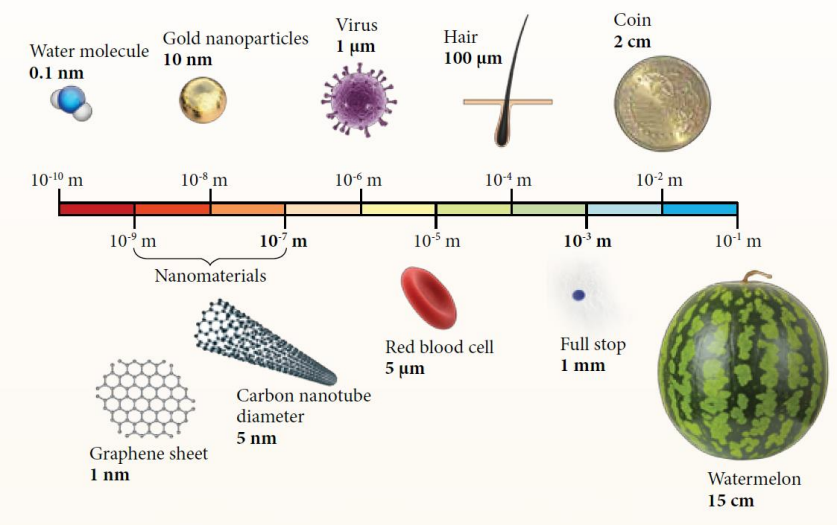
Types of Cosmetics

Make up	Powder, lipstick, mascara
Cosmetics care	Treatment on skin : cream, moisturizer
Fragrances	Deodorant perfumes

Side effect of the Used of Banned Chemicals in Cosmetics

Prohibited chemicals	**Side effects**
Mercury	Skin irritation as well as fruit damage waist and nervous system if absorbed into the bloodstream.
Hydroquinone	Skin becomes hypersensitive and pigmentation reduction resulting in skin expo
Betamethasone valerate	Skin irritation and changes in skin pigmentation
Tretinoin	Skin redness and flaking

APPLICATION OF NANOTECHNOLOGY IN INDUSTRY

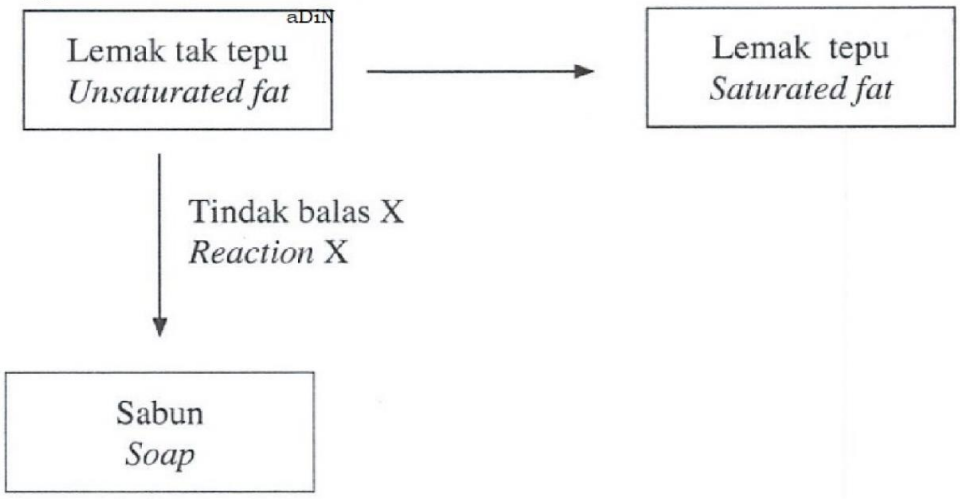
Definition nanoscience	**Definition nanotechnology**
Study on the processing of substances at the nanoscale that is between 1 nanometre and 100 nanometres.	Development of substances or gadgets using the properties of nanoparticles.
Size comparison between different materials	**Application of nanotechnology**
	

Application nanotechnology in daily life

Semiconductor	Smaller, efficient and high conductivity wiring system	Energy and electric	Smaller, efficient solar cells and long-lasting batteries
Textile	Water, fire, dirt resistant Anti - wrinkle and UV protection	Medical	High sensitive devices Effective drug delivery system
Agriculture	Effective pesticides, high efficient through fertilization	Food	Nanoscale food additives Antimicrobial food packaging

[SPM2023-02]

Rajah menunjukkan tindak balas yang melibatkan lemak tak tepu
Diagram shows reaction that involves in unsaturated fat



(a) Nyatakan satu contoh lemak tak tepu.
State one example of unsaturated fat.

..... [1M]

(b) (i) Nyatakan nama tindak balas untuk menukarkan lemak tak tepu kepada lemak tepu.
State the name of the reaction to convert unsaturated fat to saturated fat.

..... [1M]

(ii) Apakah kesan tindak balas dalam 2(b)(i) ke atas keadaan fizik lemak?
What is the effect of the reaction in 2(b)(i) on the physical state of fat?

..... [1M]

(iii) Berdasarkan Rajah 2, nyatakan nama bagi tindak balas X.
Based on Diagram 2, state the name of reaction X.

..... [1M]

(c) Tokoferol ditambah ke dalam lemak tak tepu untuk mengelakkannya menjadi tengik apabila terdedah kepada udara. Nyatakan jenis bahan tambah makanan bagi tokoferol.
Tocopherol is added into unsaturated fat to prevent it from turning rancid when exposed to air. State the type of food additive for tocopherol.

..... [1M]

[Perlis2023-05]

Persamaan berikut menunjukkan bagaimana sabun boleh disediakan
The following equation shows how soap can be prepared

Minyak sawit + Alkali pekat → Bahan X + Sabun
Palm oil + Concentrated alkali → Material X + Soap

a. Apakah / *what*

i. Nama tindak balas di atas / *is the name of the reaction above*

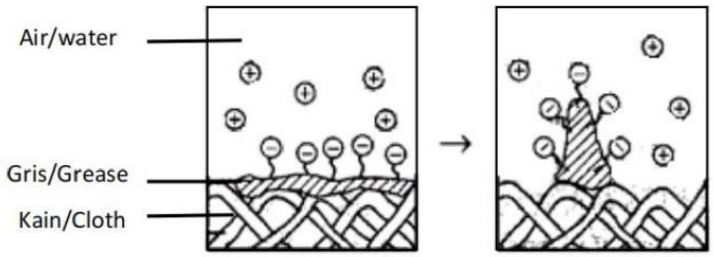
……[1M]

ii. Sabun yang terhasil adalah kalium palmitat. Apakah alkali yang perlu digunakannya
The soap produced is potassium palmitate. What alkali should be used

……[1M]

b. Rajah menunjukkan / *diagram show*

i. Sebahagian daripada tindakan pencuci oleh zarah detergen ke atas kotoran bergris pada sehelai baju.
Part of the washing action of the detergent particles on grease stain shirt



Berdasarkan rajah, terangkan pencucian oleh zarah detergen ke atas kotoran ambergris
Based on the diagram, explain the washing action of the detergent particles on greasy stains

……

……

……[3M]

ii. Anda dibekalkan dengan dua bikar, A dan B berisi yang sama ada larutan sabun atau larutan detergen
You are given two separate beakers, A and B containing soap solution or detergents solution

Bikar A/ Beaker A

Bikar B/ Beaker B

Dengan menggunakan bahan-bahan berikut, huraikan secara ringkaas bagaimana anda dapat membezakan antara asbun dengan detergen
With the use of the following materials, describe briefly how you can distinguish between soap and detergent

- Larutan magnesium nitrate / *Magnesium nitrate solution*
- Tabung didih / *Boiling tubes*
- Gabus getah / *Rubber stopper*

……

……

……[3M]

[SPM2024 -11c] (c) Air liat ialah air yang mengandungi ion kalsium, Ca^{2+} dan ion magnesium, Mg^{2+}. Persamaan kimia pada Rajah 9.2 menunjukkan hasil tindak balas antara agen pencuci A dan agen pencuci B dengan ion kalsium, Ca^{2+}.
Hard water is water that contains calcium ion, Ca^{2+} and magnesium ion, Mg^{2+}. The chemical equation in Diagram 9.2 shows the products for the reactions between cleaning agent A and cleaning agent B with calcium ion, Ca^{2+}.

Agen pencuci A *Cleaning agent A*
$2CH_3(CH_2)_{16}COO\text{-}(ak) + Ca^{2+}(ak) \rightarrow [CH_3(CH_2)_{16}COO]_2Ca(p)$ $2CH_3(CH_2)_{16}COO\text{-}(aq) + Ca^{2+}(aq) \rightarrow [CH_3(CH_2)_{16}COO]_2Ca(s)$
Agen pencuci B *Cleaning agent B*
$2ROSO^{-}{}_3(ak) + Ca^{2+}(ak) \rightarrow (ROSO_3)_2\ Ca(ak)$ $2ROSO^{-}{}_3(aq) + Ca^{2+}(aq) \rightarrow (ROSO_3)_2\ Ca(aq)$

Berdasarkan maklumat pada Rajah 9,2, pilih agen pencuci yang lebih berkesan untuk mencuci pakaian dalam air liat dan terangkan jawapan anda.
Based on the information in Diagram 9.2, choose a more effective cleaning agent to wash clothes in hard water and explain your answer.

.....

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.....

.....

..... [4M]

(d) Kaji penyataan berikut./ Study the following statement.

" Alam Flora mensasarkan kutipan 500 tan minyak masak terpakai "
" Alam Flora aims to collect 500 tonnes of used cooking oil "
Sinar Harian

Minyak masak terpakai boleh diproses bagi pembuatan sabun untuk menjana pendapatan. Berdasarkan pernyataan tersebut, cadangkan **satu** alkali yang boleh digunakan untuk menghasilkan sabun buku. Huraikan kaedah untuk menghasilkan sabun menggunakan alkali itu dengan minyak terpakai.
*Used cooking oil can be processed for the manufacturing of soap to earn income. Based on the statement, suggest **one** alkali that can be used to produce soap bar. Describe the method to produce the soap by using the alkali with used cooking oil.*

.....

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..... [8M]

[Selangor2023-set01-08]

a. Encik Wong mengalami sakit dada apabila batuk, hilang selera makan dan batuk berdarah
Mr Wong suffers from chest pain when coughing, loss appetite and coughing up blood

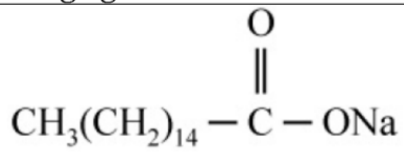
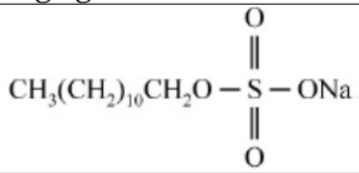
i. Sebagai seorang doktor, nyatakan jenis ubat yang patut diambil oleh Encik Wong
As a doctor, state the type of medicine that should be taken by Mr Wong

……[1M]

ii. Nyatakan satu preskripsi yang perlu dipatuhi oleh Encik Wong semasa pengambilan ubat supaya penyakit itu tidak berulang
State one prescription that Mr Wong needs to follow when taking the medicine so that the disease does not recur

……[1M]

b. Rajah menunjukkan formula struktir bagi dua jenis agen pencuci
Diagram shows the structural formula of two types of cleaning agents

Agen pencuci X Cleaning agent X	Agen pencuci Y Cleaning agent Y
	

i. Namakan proses untuk menyediakan agen pencuci X.
Name the process to prepare cleaning agent X.

……[1M]

ii. Agen pencuci X disediakan dengan mencampurkan asid palmitik daripada kelapa sawit dengan larutan natrium hidroksida pekat. Persamaan berikut mewakili tindak balas tersebut.
Cleaning agent X is prepared by mixing palmitic acid from palm oil with concentrated sodium hydroxide solution. The following equation represents the reaction

$$CH_3(CH_2)_{14}COOH + NaOH \rightarrow CH_3(CH_2)_{14}COONa + H_2O$$

Hitung jisim agen pencuci X yang terhasil jika 0.5 mol asid palmitik digunakan
[Jisim molar $CH_3(CH_2)_{14}COONa$ = 278 g mol^{-1}]
Calculate the mass of cleaning agent X produced of 0.5 mol of palmitic acid is used
[Molar mass of $CH_3(CH_2)_{14}COONa$ = 278 g mol^{-1}] ˆ [2M]

iii. Semasa menyertai perkhemahan di Pantai Cenang, Sam mendapati bajunya kotor kerana tertumpah kuah kari semasa makan tengah hari. Dia telah mencuci bajunya dengan sejenis pencuci, didapati kesan kotoran tidak dapat ditanggalkan. Cadangkan agen pencuci yang lebih sesuai digunakan untuk menghilangkan kotoran tersebut. Berikan alasan anda
While participating in camping at Pantai Cenang, Sam found his shirt dirty because he spilled curry sauce during lunch. He washed his clothes with a kind of cleaning agent, it was found that the stains could not be removed. Suggest cleaning agent which is more suitable to be used to remove the stain. Give your reasons.

……

……

……[3M]

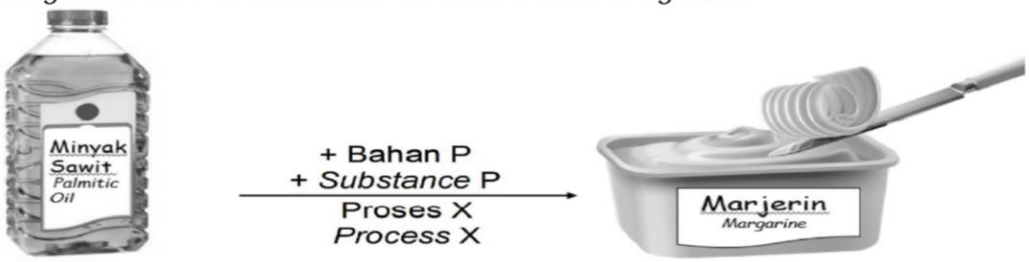
iv. Agen pencuci yang manakah lebih mesra alam? Terangkan jawapan anda
Which cleaning agent is more environmentally friendly? Explain your answer

……

……[1M]

OBJECTIVE 2025

[Kelantan 2023-24] Rajah 9 menunjukkan bagaimana minyak boleh ditukarkan kepada marjerin.
Diagram 9 shows how oil can be converted to margarine.



Apakah bahan P dan proses X? *What is substance P and process X?*

	Bahan P/ *Substance P*	Proses X/ *Process X*
A	Gas hydrogen/ *Hydrogen gas*	Penghidrogenan/ *Hydrogenation*
B	Gas oksigen/ *Oxygen gas*	Pengoksidaan/ *Oxidation*
C	Ion hidroksida/ *Hydroxide ion*	Penghidratan/ *Hydration*

[PERAK 2022 SET 1-15] Antara berikut, penyataan yang manakah betul tentang lemak dan minyak?
Which of the following statements are correct about fats and oils?

I Lemak dan minyak merupakan ester.
Fats and oils are esters.

II Lemak dan minyak diperolehi daripada sumber haiwan.
Fats and oils are obtained from animal sources.

III Lemak wujud dalam keadaan pepejal manakala minyak wujud dalam keadaan cecair pada suhu bilik.
Fats exist in solid form while oils exist in liquid form at room temperature.

IV Lemak tak tepu boleh ditukarkan kepada lemak tepu melalui proses pengoksidaan.
Unsaturated fats can be converted to saturated fats through the process of oxidation.

A I dan II
I and II

B I dan III
I and III

C II dan IV
II and IV

D III dan IV
III and IV

[Melaka 2023-12] Antara yang berikut, yang manakah kegunaan minyak dan lemak dalam kehidupan harian?
Which of the following are the uses of oil and fat in daily life?

I Sumber nutrisi
Source of nutrition

II Bahan api bio
Biofuel

III Pakaian
Clothes

IV Baja
Fertilisers

A I dan II
I and II

B I dan III
I and III

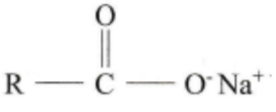
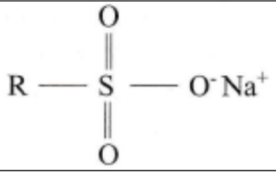
C II dan III
II and III

D II dan IV
II and IV

[2024-SBP-30] Minyak kelapa adalah sejenis lemak tepu. Antara yang berikut, komposisi manakah yang betul tentang peratus kandungan asid lemak dalam minyak kelapa?
Coconut oil is a type of saturated fat. Which of the following compositions is correct about the percentage of fatty acid in coconut oil?

	Peratus kandungan asid lemak (%) *Percentage composition of fatty acid (%)*		
	Asid laurik *Lauric acid*	Asid linoleik *Linoleic acid*	Asid oleik *Oleic acid*
A	Tinggi *High*	Rendah *Low*	Tinggi *High*
B	Rendah *Low*	Tinggi *High*	Tinggi *High*
C	Tinggi *High*	Rendah *Low*	Rendah *Low*
D	Rendah *Low*	Tinggi *High*	Rendah *Low*

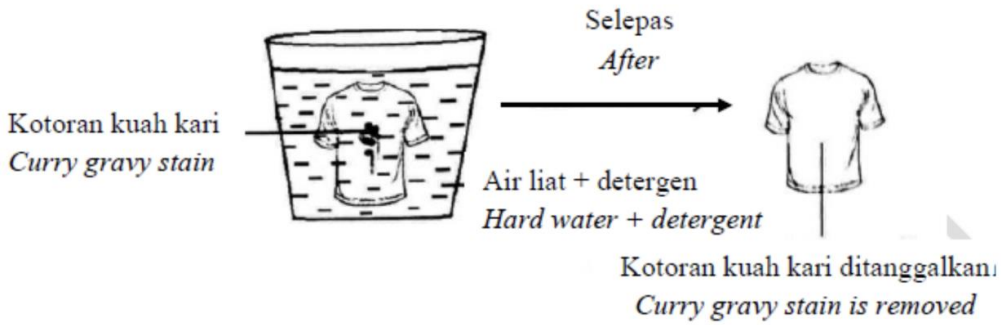
[**2024 Negeri Sembilan-13**] Rajah 3 menunjukkan formula bagi dua jenis bahan pencuci berbeza, X dan Y.
Diagram 3 shows the formulas for two different types of cleaning agent, X and Y.

	
Bahan pencuci X *Cleaning agent X*	Bahan pencuci Y *Cleaning agent Y*

Antara yang berikut, penyataan yang manakah betul tentang X dan Y?
Which of the following statements is correct about X and Y?

	X	Y
A	Mesra alam *Environmentally friendly*	Menyebabkan pencemaran *Cause pollution*
B	Berkesan dalam air liat sahaja *Effective in hard water only*	Berkesan dalam air liat dan air lembut *Effective in hard water and soft water*
C	Dihasilkan daripada pecahan petroleum *Produced from fraction of petroleum*	Dihasilkan daripada minyak atau lemak *Producedfrom oil or fat*
D	Bertindak balas dengan ion Mg^{2+} membentuk kekat *Reacts with Mg^{2+}ion to form scum*	Tidak bertindak balas dengan ion Mg^{2+} *Does not react with Mg^{2+} ion*

[2024-JUJ-Set01-29] Rajah 12 menunjukkan pemerhatian ke atas tindakan pencucian oleh detergen.
Diagram 12 shows the observation of the cleansing action by detergen.



Antara berikut, yang manakah bahan tambah dalam detergen yang menyebabkan perubahan itu?
Which of the following additives in detergent causes the changes?

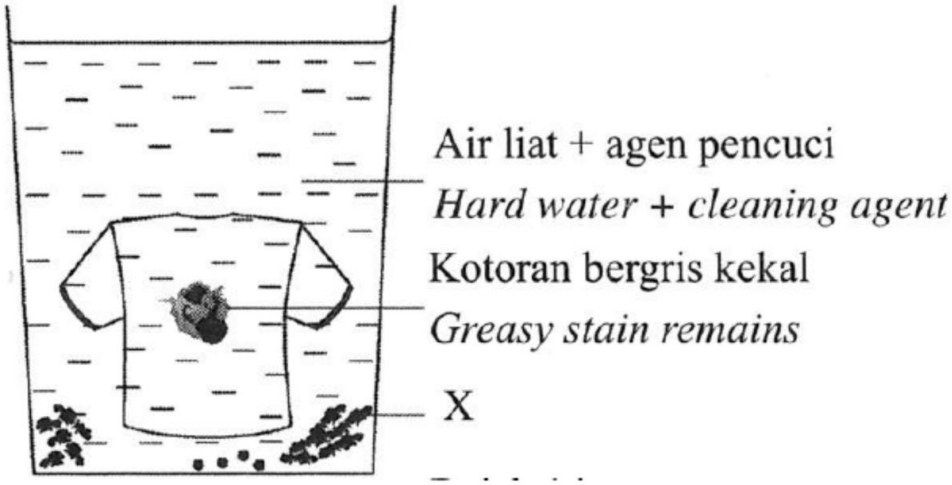
A Enzim biologi
Biological enzyme

B Pemutih optik
Optical whitener

C Agen antienapan
Anti-suspension agent

D Agen pengawal buih
Foam control agent

[**SPM2023-30**] Rajah 14 menunjukkan pemerhatian bagi tindakan pencucian pada sehelai baju oleh suatu agen pencuci.
Diagram 14 shows an observation of a cleansing action on a piece of shirt by a cleaning agent.



Apakah X?/ *What is X?*

A $CH_3(CH_2)_{16}COO^-$
B $[CH_3(CH_2)_{16}COO]_2Mg$
C $CH_3(CH_2)_{11}OSO_3^-$
D $[CH_3(CH_2)_{11}OSO_3]Mg$