



UNITED ARAB EMIRATES
MINISTRY OF EDUCATION

2023-2024



HEALTH SCIENCES

WORKBOOK



Health Sciences

Workbook

General

Grade 12

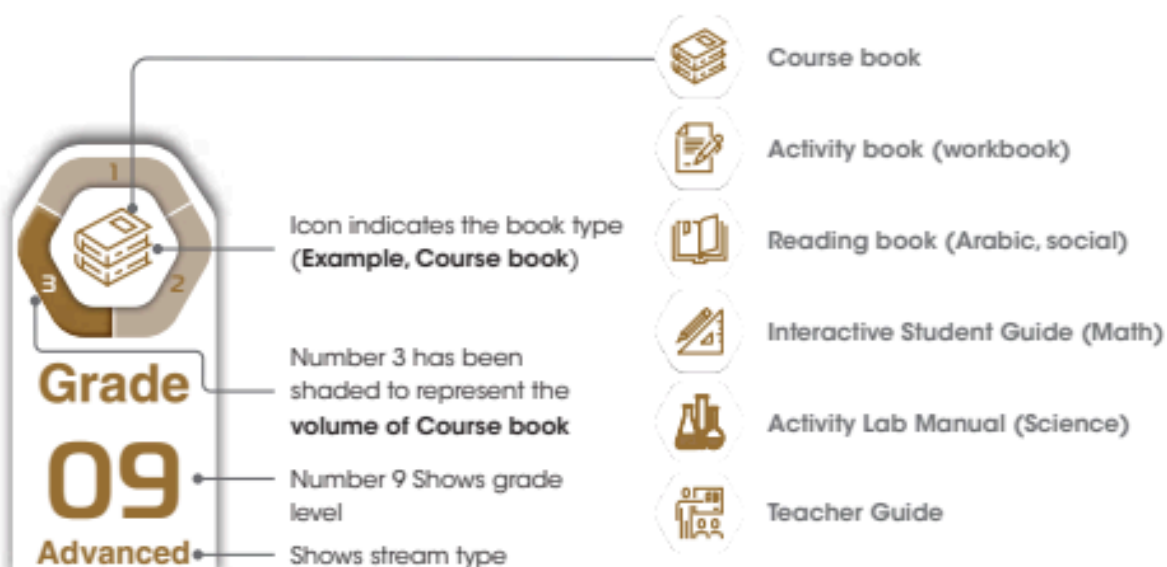
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How to use this book



Video

Indicates access to a video to support learning.



Remember

An important fact to remember.



Keyword

Provides an explanation of a language term and expression.



Example

A real life example that demonstrates the unit information.



Did you know?

Bite size pieces of interesting information related to the topic.



Think

Take time to reflect on the presented information.



Research

Research information on specific questions related to the topic.



Discussion

Discuss the highlighted topic with your class.



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UNIT 9

Pharmacy

- 9.1** History of pharmacy
- 9.2** Pharmacology
- 9.3** Routes of administration
- 9.4** Antibiotics
- 9.5** Latin abbreviations in pharmacy
- 9.6** Measurements and formulas
- 9.7** Safety measures in pharmacy

Introduction

In the past, pharmacy used to be part of medicine. It became a separate and independent science during the Islamic Golden Age (8th century until 14th century), since then it has evolved (developed) a lot and nowadays pharmacy has different types and specialisations.

The development of pharmacy has helped cure disease, improve quality of life and most importantly it has saved lives. In the past many diseases used to cause death to people, nowadays those disease can be managed and treated thanks to the science of pharmacy.

In this unit, you will learn many things related to pharmacy, such as how pharmacy evolved through history, the important areas of study within pharmacy, including pharmacology and its two major principals. You will also learn how drugs are administered, and important measurements related to this. Finally, you will learn about safety in pharmacy, mostly in communication and storing medicines at home.



Learning outcomes

Standard HSC.3.9.01: Identify the major principles of pharmacy and medical mathematics and describe the safety measures of drug administration and storage at home.

Learning outcomes:

HSC.3.9.01.006	Demonstrate an understanding of the history of systems of medicine, medicines and pharmacy.
HSC.3.9.01.007	Interpret basic Latin prescription abbreviations.
HSC.3.9.01.008	Identify the evolving roles of the pharmacist in different disciplines.
HSC.3.9.01.001	Define pharmacology, pharmacokinetics and pharmacodynamics; and discriminate between drugs, medicines and excipients.
HSC.3.9.01.002	Identify how different dose forms, routes of administration and dose adjustment impact upon the clinical outcome of drug administration.
HSC.3.9.01.003	Identify the appropriate use of antibiotics.
HSC.3.9.01.004	Demonstrate competence in a broad range of basic, scientific and pharmaceutical calculations.
HSC.3.9.01.009	Demonstrate an understanding of essential communication skills applied to pharmacy.

Keywords

Word	Form	Definition
abbreviation	noun	a shortened form of a word or name that is used in place of the full word or name
absorption	noun	how something gets into something else; how the drug gets into the bloodstream
administration	noun	to provide something
agonist	noun	connects to a receptor and produces a maximum effect
botany	noun	the part of biology that studies everything about plants, such as their structure, classification, properties, diseases and interaction with the environment
catalyst	noun	a substance that increases the rate of a chemical reaction
diffusion	noun	spread out over a large space
distribution	noun	the way something is shared; which part of the body a drug goes to
dispensing	verb	giving drugs or medicines following what a doctor has written or recommended (prescription)
dosage	noun	the amount and how often you should take a medication or drug
drug	noun	a chemical substance that is taken from a plant, animal, microorganisms or minerals

Word	Form	Definition
enzyme	noun	work to speed up chemical reactions
excipient	noun	a component used when making medicines
herbs	noun	a plant or a part of a plant that is used to make medicines
metabolism	noun	what the body does to break down the drug
medicine	noun	a result of a drug or drugs being mixed, with or without an excipient
pharmacists	noun	a healthcare professional specialised in preparing, using, storing and providing medicines
pharmacodynamics	noun	the effect that drugs have on the body
pharmacokinetics	noun	the study of what happens to drugs once they enter the body
pharmacology	noun	the study of drugs and the effect they have on the body
prescription	noun	a written message from a doctor that officially tells someone to use a medicine
procedures	noun	a set of actions that are an accepted way of doing something
receptors	noun	part of a cell that, when connected to a substance, causes a chemical change within the cell

Word	Form	Definition
resistance	adjective	stopping something from having an effect
side effect	noun	an often harmful and unwanted ef-fect of a drug; this normally happens along with the desired effect
solution	noun	a liquid mixture of different components
store	verb	to keep something hidden or away and usually in a safe place

9.1 History of pharmacy

STARTER



Word search

Can you find the pharmacy keywords listed in the table below?

C	X	R	C	D	R	A	T	E	F	L	T	N	F	R
U	B	R	G	T	I	U	U	H	G	W	I	A	P	P
P	I	E	N	J	V	S	X	C	O	R	S	G	A	O
H	W	E	S	L	G	P	P	M	J	O	P	C	J	O
A	T	H	Z	Z	A	E	T	E	X	W	L	Q	Y	Y
R	Y	I	B	C	F	D	R	V	N	V	S	Q	B	C
M	A	S	H	H	K	V	J	P	S	S	I	C	U	B
A	N	T	E	P	H	A	R	M	A	C	I	S	T	P
C	Y	O	P	J	W	D	Y	L	S	X	X	N	P	P
Y	U	R	H	F	V	J	M	U	H	R	I	V	G	K
H	M	Y	E	T	Z	H	L	O	R	V	C	E	O	G
S	P	U	R	Q	T	O	N	W	O	B	Z	X	V	B
K	W	U	B	P	J	M	B	O	T	A	N	Y	G	J
K	Y	U	S	X	P	V	L	C	D	P	J	X	S	I
I	T	V	U	K	F	C	Y	B	M	G	I	Y	V	J

PHARMACIST	DISPENSING	BOTANY
PHARMACY	HERBS	HISTORY

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Activity 1

Pharmacy



Decide if the following statements about pharmacy are true or false.

Statements	True	False
Pharmacy is the science of collecting, preparing and dispensing drugs.		
Pharmacy is a very modern and new science. It didn't exist since a very long time ago.		
Ancient (old) Greeks were the first ones to treat a person using a drug.		
During the Islamic Golden Age, the separation between pharmacy and medicine happened.		
Pharmacists are healthcare professionals specialised in preparing, using, storing and providing medicines.		



Research: Muslim scientists in the Islamic Golden Age

Research the work of Muslim scientists whose work contributed into the development of pharmacy.

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.....

Activity 2

7

community	clinical	home care	research
These pharmacists develop new drugs.			
These pharmacists work in a pharmacy where you would go to buy medicines.			
These pharmacists work in hospitals with doctors and nurses.			
These pharmacists are responsible for preparing and sending medication to people who are at home.			

Notes:

9.2 Pharmacology

STARTER



Word search

Can you find the pharmacology keywords listed in the table below?

A	F	B	D	S	T	S	Z	D	L	L	X	O	B	W
K	B	R	D	K	U	D	Y	K	C	A	O	N	P	T
E	U	S	B	D	H	E	M	Z	R	C	O	S	E	F
G	I	Y	O	A	G	W	S	V	P	I	R	M	Z	C
B	T	N	R	R	W	R	X	F	T	G	E	K	X	T
F	A	I	B	Z	P	A	S	U	Z	O	C	H	D	U
V	P	X	P	E	M	T	B	T	W	L	E	J	G	U
W	E	U	L	I	V	I	I	U	T	O	P	W	E	A
I	J	D	D	M	R	U	J	O	I	I	T	N	D	G
S	E	X	F	T	Q	P	H	W	N	S	O	E	N	H
D	F	H	S	K	T	O	S	D	X	Y	R	F	R	L
I	D	I	N	L	G	B	Z	L	E	H	S	S	D	H
F	D	B	X	U	M	C	J	O	U	P	T	B	X	P
M	E	T	A	B	O	L	I	S	M	V	L	H	I	P
U	P	O	J	G	F	B	I	G	R	L	V	Y	H	Q

ABSORPTION	DISTRIBUTION	DRUG
METABOLISM	PHYSIOLOGICAL	RECEPTORS



Activity 3

What is pharmacology

In the space below, explain what pharmacology is and write down the two major principals of pharmacology.

.....

.....

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.....

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Activity 4

Pharmacokinetics

There are four stages of pharmacokinetics. In the spaces below, write the name of each stage and explain what it means.

Stage of pharmacokinetics	What does it mean?
	How the medicine gets into the body
Distribution	
	What the body does to the medicine
Excretion	

9.2 Pharmacology



Activity 5

Pharmacodynamics



What is the meaning of pharmacodynamics?

.....

.....

What factors affect the pharmacodynamics of a drug?

.....

.....

.....



Activity 6

Pharmacokinetics or pharmacodynamics



Look at the sentences in the table below. Choose whether they are describing pharmacokinetics or pharmacodynamics.

Statement	Pharmacokinetics	Pharmacodynamics
Metabolism is what the body does to a drug.		
This is the study of what happens to drugs once they enter the body.		
Patient age or pregnancy are factors that influence what the drug does to the body.		
This is the study of the effect that drugs have on the body.		



Activity 7

Drug, medicine or excipient



Decide if the following sentences about drugs, medicines and excipients are true or false.

Sentences	True	False
Drugs are directly used as a treatment. For example, a drug can directly treat a pain or cure an infection.		
An excipient helps formulating, protecting or supporting a medicine.		
Medicines are chemical substances that are taken from plants, animals, microorganisms or minerals.		
Medicines can contain (have) an excipient or not.		
Drugs are considered ingredients to medicines.		
An excipient makes a medicine unsafe and harmful to use.		
Medicines are directly used as a treatment.		

9.3 Routes of administration

STARTER Keyword matching

Match the keyword to the correct description.

Chemical

A condition where part of the body becomes red, swollen and painful.

Prescription

Relating to chemistry; any substance consisting of matter.

Inflammation

A change in the body that indicates a disease is present.

Symptoms

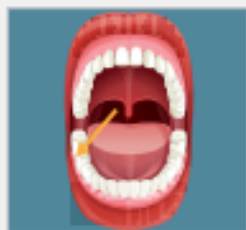
A written message from a doctor that officially tells someone to use medicine.



Activity 8

Sublingual and buccal

Look at the images and descriptions below. Identify if the route being described is sublingual or buccal. Write your answer in the boxes below the description.



The drug is placed between your gums and cheek.



The drug is placed under the tongue.



Activity 9

Routes of administration

Match the following routes of administration with the correct explanation.

Oral

When the area to be treated is easy to reach. For example, the skin.

Topical

When the patient takes medication through the mouth.

Parenteral

The use of injections.

Choose one of the routes of administration above and write down one advantage and one disadvantage of this route.

Advantage

.....

.....

.....

Disadvantage

.....

.....

.....

9.3 Routes of administration



Activity 10

Routes of administration

Decide on the appropriate route of administration for each of the following forms of medication.

Form of medication	Route of administration
 ONTHENTS, CREAMS, GELS	
 INJECTIONS	
 TABLETS, PILLS	
 SPRAY	
 CAPSULES	
 INFUSION	

Notes:

9.4 Antibiotics

STARTER 

Keywords matching

Match the keyword to the correct definition.

Pharmacy

A healthcare professional specialised in preparing, using, storing and providing medicines.

Pharmacist

To provide or give something

Medicine

the science of collecting, preparing and dispensing drugs.

Administration

A substance used to treat a disease or illness.



Activity II

Using antibiotics

Answer the following questions about using antibiotics.

What is an antibiotic?

.....

.....

.....

.....

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Can antibiotics cure (treat) COVID-19 infection?

Yes, it can cure it.

No, it cannot cure it.

What is the most common route of administration for antibiotics?

Oral

Topical

Buccal

How long does it take for oral antibiotics to start fighting bacteria?

2 hours

2 minutes

10 minutes

What does it mean to "complete the course" of antibiotics?

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Notes:

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9.4 Antibiotics



Activity 12

Antibiotic resistance



Answer the following questions about antibiotic resistance.

What is antibiotic resistance?

What causes antibiotic resistance?

Draw a picture of what you think antibiotic resistance looks like.



Activity 15

Prescribing antibiotics

Read the following scenarios and decide if you think the person requires a prescribed antibiotic or not.

Scenario	Is an antibiotic needed?	Why?
Mahra has a virus which has given her a chest infection.		
Sultan has a bacterial infection in his eye that spreads easily from person to person.		



Research: Side effects

Research common side effects that you may feel after taking any medication.

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Research and explain the difference in experiencing side effects from medication and experiencing an allergic reaction to medication.

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.....

9.5 Latin abbreviations in pharmacy

STARTER

Abbreviations

Abbreviations are a shortened form of a word, name or sentence that is used instead of the full word, name, or sentence.

Do you know any abbreviations? Using the hints, try to guess what the full word or sentence of the following abbreviations is. The first one is an example.

Example:

FYI: For your information

Common abbreviations:

1. EG: Ex _ _ _ _ _
2. ASAP: _ _ soon _ _ _ _ _
3. TBC: To _ _ _ _ _
4. ETA: _ _ _ _ _ Time of _ _ _ _ _
5. DOB: _ _ _ _ Of _ _ _ _



Discussion: Abbreviations you use

Discuss with your class any other abbreviations you use and list them below.

.....

.....

.....

.....

.....



Activity 14

True or false



Read the following sentences about abbreviations in healthcare and decide if the sentence is true or false.

Sentence	True	False
Abbreviations are not used in healthcare.		
Abbreviations are only used by doctors.		
Healthcare professionals use abbreviations when writing and communicating.		
Not interpreting abbreviations correctly can be dangerous for patients.		
Interpreting abbreviations correctly is very important as it guarantees patients' safety.		



Research: Abbreviations in healthcare

Why are abbreviations used in healthcare? Research the reasons why healthcare professionals use abbreviations when writing and communicating. When you finish researching, discuss your findings with your class.

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9.5 Latin abbreviations in pharmacy



Activity 15

Abbreviations



Read the abbreviations below and write the meaning of each of them.

Abbreviation	Meaning
kg	
ml	
PO	
IV	
Dr.	
Tx	
Dx	

Notes:



Activity 16

Interpreting Latin abbreviations in pharmacy



Imagine you are a pharmacist or a nurse, you are going to read now the medical records of a patient who was admitted to hospital yesterday. After you finish reading the medical record, answer the questions on the next page.

♂ 72 y.o. admitted to A&E due to SOB, F/C/S, cough

Tests: Chest XR, FBC, MCS, ABG,
Sputum sample.

Dx: pneumonia

Tx: antibiotic therapy, antipyretic

BP 132/77

T 39.5

O₂ 82%

HR 132

RR 31

Rx:

1. Augmentin 1.2g, IV, qid, pneumonia
2. Clindamycin 300mg, PO, tid, ac, 7 days, pneumonia
3. Paracetamol 1g, IV, tid, fever

9.5 Latin abbreviations in pharmacy

1. What is the diagnosis of the patient?

.....

2. What type of X-Ray did the patient have?

.....

3. What are the names of the three medicines the patient has been prescribed?

.....

.....

.....

4. What is the indicated route of administration of Augmentin 1.2g and Clindamycin 300mg?

.....

5. How many times is Paracetamol 1g prescribed?

.....

6. How many times is Augmentin 1.2g prescribed?

.....

7. When should the patient take Clindamycin 300mg? Before, with or after food?

.....



Your teacher will divide the class into three groups: group YES, group NO and group JUDGES. Groups YES and NO will prepare their arguments and present them to the class. After both groups finish presenting, group JUDGES will decide which group has won the debate and explain why. Remember: be creative with your arguments.

9.6 Measurements and formulas

STARTER Guess what am I?

In pairs or small groups, choose one of the keywords shown below in secret. Don't tell the keyword to anyone!

Explain (in words or acting) the meaning of the keyword to the other person or the group and see if they can guess the keyword.

The quickest to guess the keyword is the winner!

antibiotics	oral	sublingual
topical	pharmacist	dispensing



Activity 17

Conversions

Convert the following units. You can use the space below for your calculations.

15g to mg	3kg to g
7L to ml	8L to ml
2 hours to min	4 min to sec



Activity 18

Calculating tablets

Calculate the correct number of tablets in the following scenarios. Remember, the 'No. of tablets' section is for one dose only.

Scenario 1

There is 5mg of prednisolone in one tablet. The doctor wants the patient to take 40mg once daily at 7am. How many tablets should the patient take at 7am?

Desired dose	Equation	Stock strength	Equals	No. of tablets
	÷		=	

Scenario 2

The doctor has prescribed 400mg of Ibuprofen three times a day for a patient. The tablets come in 200mg tablets. How many tablets need to be dispensed per day?

Desired dose	Equation	Stock strength	Equals	No. of tablets
	÷		=	

Scenario 3

There is 250mg of penicillin in one tablet. The doctor wants the patient to take 500mg twice daily. How many tablets should the patient take in the morning?

Desired dose	Equation	Stock strength	Equals	No. of tablets
	÷		=	

9.6 Measurements and formulas



Activity 19

Calculating mixtures and solutions

Look at the scenarios below. Use the calculation tables to calculate the amount of solution needed.

Scenario 1

A child has a temperature of 39.0°C. The doctor has ordered a 500mg paracetamol suspension, four times a day. Paracetamol suspension comes in 250mg/5ml. How much paracetamol suspension needs to be dispensed per day?

Desired dosage	Equation	Stock strength	Equation	Stock volume (ml)	Equals	Amount of solution required (ml)
	÷		X		=	

Total per day = _____

Scenario 2

The doctor has ordered a 250mg paracetamol suspension, two times a day. Paracetamol suspension comes in 250mg/5ml. How much paracetamol suspension needs to be dispensed per day?

Desired dosage	Equation	Stock strength	Equation	Stock volume (ml)	Equals	Amount of solution required (ml)
	÷		X		=	

Total per day = _____



Activity 20

Calculating IV rate

Calculate the correct IV rates in the following scenarios.

The 'total IV volume' section should be entered in ml. You may need to do unit conversion.

Scenario 1

The doctor has prescribed 300ml of normal saline solution over six hours. What is the rate in ml per hour?

Total IV volume (ml)	Equation	Time (Hours)	Equals	ml administered
	÷		=	

Scenario 2

A patient needs to be given two litres of saline over 16 hours. What is the rate in ml per hour?

Total IV volume (ml)	Equation	Time (Hours)	Equals	ml administered
	÷		=	

Scenario 3

A patient needs to be given 50ml of saline over 90 minutes. What is the rate in ml per hour?

Total IV volume (ml)	Equation	Time (Hours)	Equals	ml administered
	÷		=	

9.7 Safety measures in pharmacy

STARTER Safety with drugs

Safe administration and storage of medication are very important. What might happen if medications are not administered or stored (kept) correctly?



Activity 21

Communication in pharmacy



Read the following scenario and answer the questions on the following page.

Scenario:

Sheikha has an infection in her tooth. The dentist prescribed her Ibuprofen 600mgs (painkillers) and Augmentin 500mgs (antibiotics).

Sheikha went to the pharmacy to buy the medicines. The pharmacists asked Sheikha her age only and explained that she has to take each medicine twice a day after food for 7 days.

Sheikha started taking the medicines following the pharmacist's advice, however 3 hours after taking the Augmentin 500mgs, she started feeling very itchy and noticed a skin rash and hives all over her body. Sheikha is allergic to penicillin, however she is not sure if Augmentin is penicillin or not.

Questions:

1. How do you think the communication between Sheikha and the pharmacists was?

.....

.....

.....

2. What should the pharmacists have asked Sheikha before giving her the medicines?

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3. Do you think the medicine was safe for Sheikha? Explain your answer.

.....

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.....

9.7 Safety measures in pharmacy



Activity 22

Matching



Match 'the six rights of drug administration' on the left to the correct description on the right.

Right drug

The caregiver should double-check the patient's name and DOB on the label.

Right patient

The medication should only be given by the route it was prescribed.

Right dosage

Administer the exact amount directed by the doctor.

Right route of administration

Thirty minutes before or after is acceptable.

Right time

When you give medication, you should make a record.

Right documentation

Errors can happen if the two drugs have a similar name.

Notes:

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Activity 25

Storage

Look at the images below. Explain whether you think they are being stored safely or not.

Image	Is it an example of safe storage? Explain your answer.
	
	
	
	

End of unit quiz

1. What is the definition of pharmacy?

.....

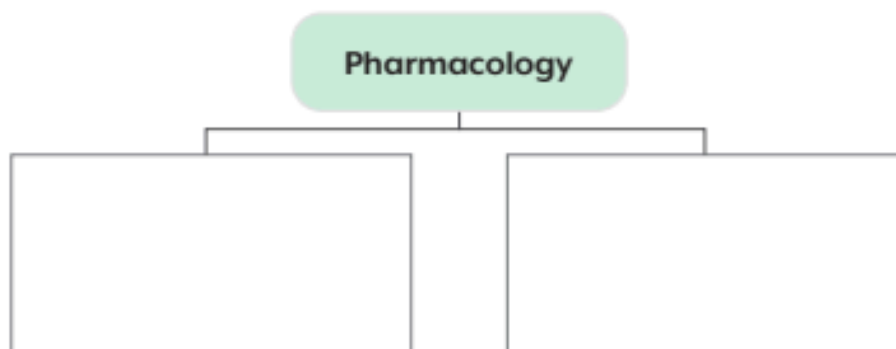
.....

.....

2. What are the four types of pharmacy you have studied in this unit?

--	--	--	--

3. In the diagram below, write the name of the two principals of pharmacology and explain what each of them mean



4. In the image below, indicate the oral, sublingual and buccal routes of administration.



5. What is antibiotic resistance and why does it happen?

.....

.....

.....

.....

6. What do the following abbreviations mean?

Abbreviation	Meaning
IM	
TOP	
bid	
Rx	
qid	
PRN	

7. Explain how effective communication can improve safety in pharmacy.

.....

.....

.....

8. What are “the six rights of drug administration”?

.....

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.....

.....

Notes:

Notes:



UNIT 10

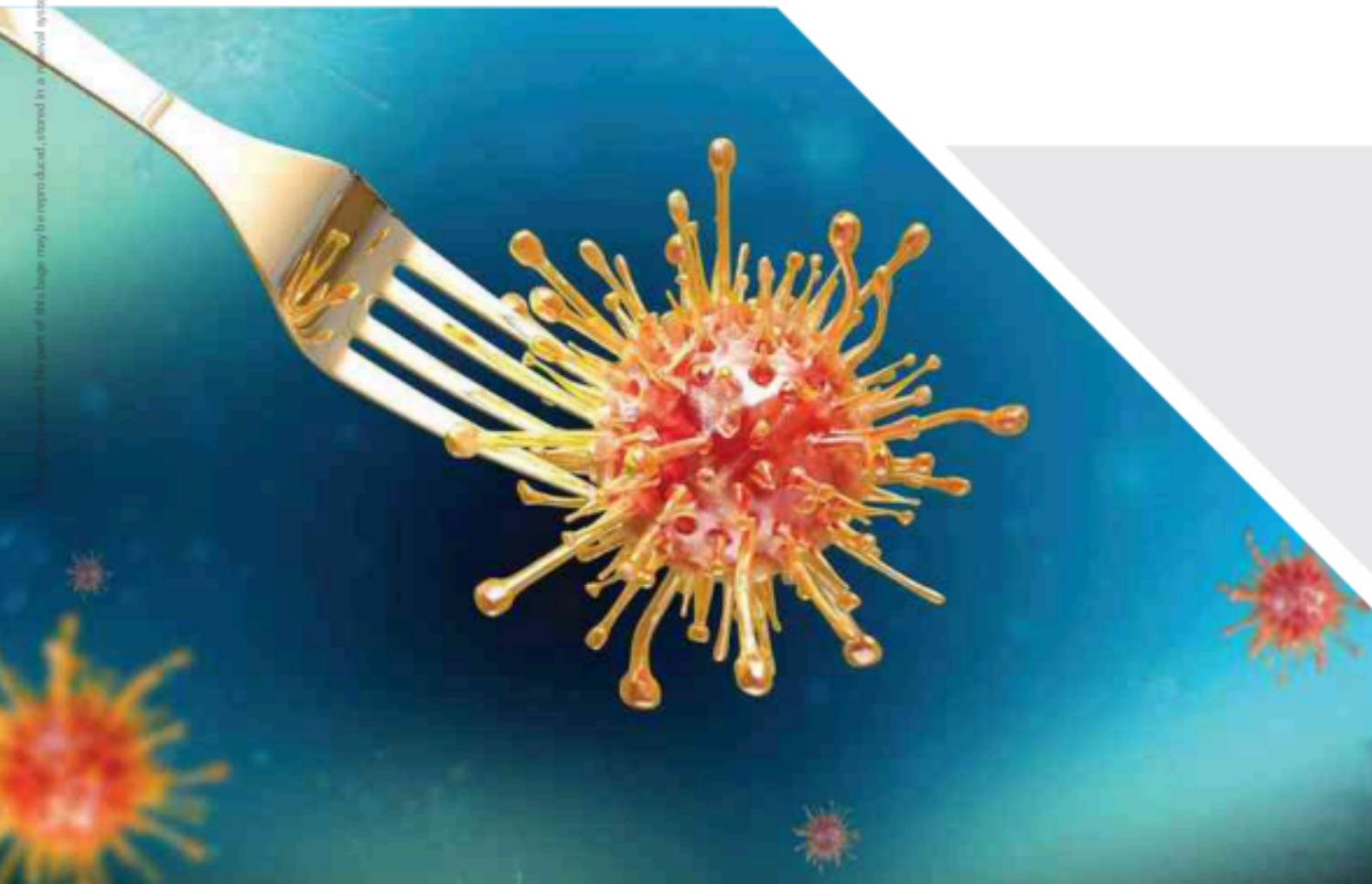
Food safety and hygiene

- 10.1** Foodborne illness
- 10.2** Cross-contamination
- 10.3** Preventing foodborne illness
- 10.4** Food allergies and intolerances

Introduction

Foodborne illnesses, also known as food poisoning, are caused by eating food that are contaminated with bacteria, viruses or other harmful substances. Food can become contaminated at any point during slaughter, processing, transport, storage, or preparation. There are many different bacteria that cause more than 200 foodborne illnesses. For every ten people who eat contaminated food, one person will become ill. Foodborne illness can cause death, particularly in young children and older adults.

In this unit, you will look at the components of food safety and storage that can lead to foodborne illness. You will understand how to prevent causing foodborne illnesses, and five key steps which should be taken in order to prevent the spread of dangerous bacteria to humans ranging from hand washing to food storage. You will explore the many causes of allergies and intolerances, how they are treated.



Learning outcomes

Standard HS.4.2.01 Recognise the importance of food safety and hygiene in avoiding foodborne illness and cross-contamination and explore food related allergies and intolerances.

Learning outcomes:

- | | |
|---------------|---|
| HS.4.2.01.001 | List the causes of foodborne illness. |
| HS.4.2.01.002 | Explore the concept of cross-contamination. |
| HS.4.2.01.004 | Identify the importance of proper hygiene practices when handling and storing food and preparing meals. |
| HS.4.2.01.005 | Compare and contrast food allergies and food intolerances. |

Keywords

Word	Form	Definition
allergy	noun	a medical condition that causes someone to become sick after eating or touching something that is harmless to most people
anaphylaxis	noun	a dangerous allergic reaction that can cause death
bacteria	noun	a group of very small living things that cause disease
contaminated	verb	when something becomes dangerous, for example food, when a harmful or undesirable substance is added, like bacteria
diarrhoea	noun	An illness that causes waste to be passed from the body frequently in liquid rather than solid form
disease	noun	a condition that prevents the body from working normally
faeces	noun	solid waste that is released from the body
foodborne	noun	when something is carried through food, such as a disease
symptom	noun	a change in the body or mind that suggests there is a disease
transmission	noun	the process by which something is spread or passed from one person or thing, to another
raw	adjective	food that is not cooked
slaughter	verb	the killing of animals for food
poultry	noun	bird that are kept for eggs and meat

10.1 Foodborne illness



Discussion: Foodborne illness

Have you ever had a foodborne illness? What caused it and what signs and symptoms did you have? Discuss with your class.

.....

.....

.....

.....

.....



Activity 1

Disease-causing microorganisms



In the space below, list the five disease-causing microorganisms that can be found in food.

1.
2.
3.
4.
5.

From the list above, which microorganism is the most common cause of disease?

.....



Activity 2

Fill in the blanks



Read the following paragraph about foodborne illnesses. Fill in the blanks with the correct answers.

Foodborne illnesses normally last a time. They happen from to hours after eating food that is contaminated. Most people recover treatment.



Activity 3

The kitchen



Below is an image of a kitchen. Circle the places you think you would find bacteria in this kitchen.



In which part of the kitchen do you think you would find the most bacteria?

.....

Why does it contain the most bacteria?

.....

.....

10.1 Foodborne illness

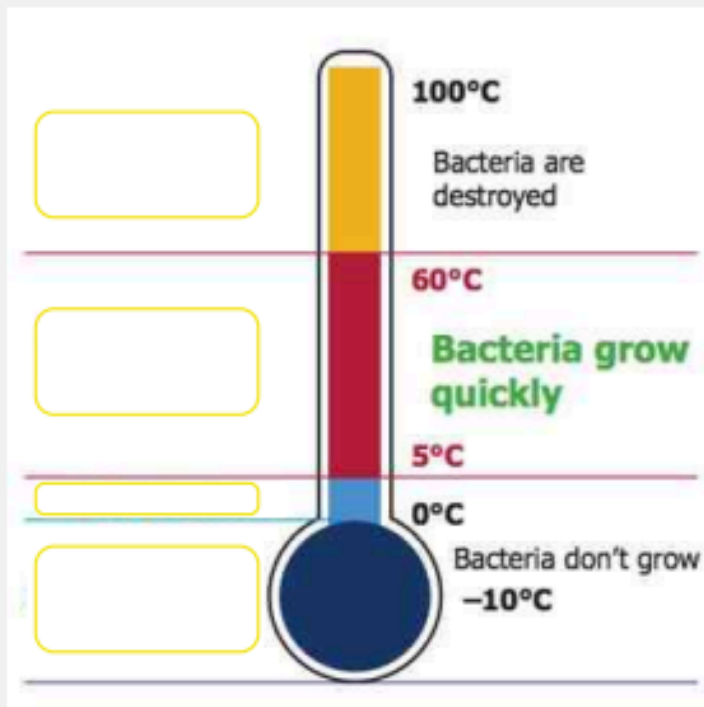


Activity 4

Temperature zones



Label each of the temperature zones correctly.



Activity 5

Bacteria leading to illness



Write the name of the four types of bacteria that lead to foodborne illness.



In the space below, explain the following:

- ⊙ How it affects the body
- ⊙ Where it can be found
- ⊙ Signs and symptoms of an illness caused by the bacteria

10.1 Foodborne illness



Activity 6

High-risk foods

Complete the table below by writing the names of three high-risk foods and explain why they are high risk.

Name of food	Why it is high risk
	
	
	



Activity 7

Poster



Choose a high-risk food and create a poster that will inform people how to minimise their chances of contracting a foodborne illness from eating this food.

10.1 Foodborne illness



Activity 8

Comprehension

Read the following newspaper article that was taken from a UAE newspaper in 2019. Answer the questions on the next page.



The Daily News

Dubai restaurant closed after 15 people became ill in food poisoning outbreak

The Dubai Municipality has shut down a restaurant after 15 people became ill following a food poisoning outbreak recently.

The outlet in Jumeirah has been forced to shut after the municipality received a report of 15 people becoming sick after eating at the restaurant. The patients were hospitalised with symptoms such as diarrhoea, fever and vomiting.

Samples of food were collected and tested. The infection was traced to Salmonella bacteria from raw eggs which were used by the chef to make hollandaise sauce. There is a ban on Dubai restaurants using unpasteurised eggs in ready-to-eat products.

Once the restaurant reopens, it will be watched very closely for six months.



Source: The National Newspaper.

Now, answer the following questions.

1. Where is the restaurant located?

.....

2. How many people became ill?

.....

3. What symptoms did the people have?

.....

.....

.....

4. What bacteria caused the food poisoning and where did it come from?

.....

.....

.....

5. Are eggs part of the 'high-risk foods' group? Explain why.

.....

.....

.....

10.2 Cross-contamination

STARTER**Contamination re-cap**

Think back to the previous lesson where you learned about contamination.

In your own words, explain what contamination is.

List the points that contamination by bacteria can happen.



Activity 9

Contamination situations

In groups, identify three points where contamination can happen during food processing for a food of your choice. Read the following example to help you.

Food: Apple

Point 1: Contamination can happen in an orchard as chemical pesticides are sprayed to keep ants away from the apples.

Point 2: Contamination can happen during transport as the apples come into contact with bacteria from dirty containers.

Point 3: Contamination can happen in the kitchen if they are sliced using a dirty knife or chopping board.

Food:

Point 1:

Point 2:

Point 3:

10.2 Cross-contamination



Activity 10

Types of cross-contamination

Read the following scenarios and decide which type of cross-contamination is being described.

Remember, there are three types of cross-contamination; food-to-food, equipment-to-food and people-to-food.

Huda made dinner for the family. When she finished, she rinsed the utensils (knife and fork) in cold water and left them to dry. The next day Huda's mother used the same utensils to prepare breakfast. During the day, the whole family became unwell.

.....

Mohammed works in a fast-food restaurant. He emptied the bins in the restaurant and did not wash his hands. Then he prepared some burgers. Customers reported feeling sick a few days after this happened.

.....

Hind used a brown chopping board to prepare some sushi for her friends. Hind and her friends thought the sushi was delicious, but they could not understand why everyone was sick the next day.

.....

Saeed went shopping and packed raw chicken meat with vegetables. When he got home he was very tired and decided to keep them in the same bag. The next day Saeed prepared a salad with the vegetables. Within hours he was very unwell.

.....



Activity 11

Colour coding



Can you remember what food items are used with each colour of chopping board?
Label each of the colours below with the correct food items.

Prevent cross-contamination

Use the correct coded chopping board and knives

Red

Blue

Maroon

Yellow

Green

White

10.3 Preventing foodborne illness



STARTER Preventing foodborne illness

Read the following sentences. Tick whether you agree, disagree or are not sure of the sentence.

Statement	Agree	Disagree	Not sure
Regular handwashing during food preparation is worth spending extra time on.			
Keeping kitchen surfaces clean reduces the risk of illness.			
Keeping raw and cooked food separate will help to prevent illness.			
Using the same knives and cutting boards for raw and cooked foods is not a problem.			
Meat thermometers are useful in making sure food is cooked properly.			
Soups and stews should be boiled to make sure they are safe.			
You should defrost food in the sun.			
It is unsafe to leave chilled (cold) food out of the fridge for more than two hours.			
Checking foods are fresh before buying them is important.			



Activity 12

The five keys to safer food

Watch the video created by the World Health Organization. It shows the five steps to safer food handling and storage.

What are the five keys to safer food?

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.....

.....

.....

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Use the space below to make any other notes you have from the video.

.....

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.....

10.3 Preventing foodborne illness



Activity 13

Handwashing



Can you remember the steps for proper handwashing? Number the steps below from one to four.

	Dry hands with a clean dry towel.
	Wet hands under running water.
	Rub hands together for at least twenty seconds with soap.
	Rinse the soap from hands under running water.



Activity 14

Cleaning and sanitising



In the space below, explain the difference between cleaning and sanitising.

.....

.....

.....

.....

.....



Activity 15

Storage of foods

Look at the following pictures. Identify whether the pictures are good or bad examples of how to store food in a fridge. Give a reason for each answer.

Image	Is this a good or bad example of food storage? Explain why.
	
	
	
	

10.3 Preventing foodborne illness



Research: Cold temperatures

Research which bacteria can survive at low temperatures. Write your answers below.

.....

.....

.....

.....

.....

.....



Activity 16

Cooking food



Answer true or false to the following statements about cooking food.

To cook food thoroughly means that it is cooked correctly and properly.	
Cooking food to 50°C will kill large groups of bacteria within twenty seconds.	
One way to check that food is cooked is to use a stethoscope.	
Microwave ovens can cause toxic chemicals to be released from plastic.	



Activity 17

The temperature danger zone



In the space below, write what the temperature danger zone for food is.



Temperature danger zone:

.....

Why is it called the danger zone?

.....

.....

.....



Activity 18

Microwave ovens



Write down two dangers of using a microwave oven to cook or reheat food.

.....

.....

.....

.....

.....

.....

10.3 Preventing foodborne illness



Discussion: Foodborne illness

Do you drink tap water from your home? Discuss in your groups why you either do or do not drink water from the tap.



Activity 19

Food safety quiz



Scan the QR code below to complete the WHO quiz on food safety.



How many marks did you get in the quiz?



1

10.4 Food allergies and intolerances



Discussion: Allergies

Have you or does anybody you know have a food allergy? If so, what is the allergy? What would happen if you (or the person you know) ate this food?

.....

.....

.....

.....



Activity 21

Allergies and intolerances



Write as many food allergies and intolerances as you can think of.

.....

.....

.....

.....

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.....

.....



Activity 22

What contains lactose?



In the space below, draw and label foods that contain lactose.



Activity 23

What contains gluten?



In the space below, draw and label some foods that contain gluten.

10.4 Food allergies and intolerances



Activity 24

Comparison



Complete the table below to compare food allergies and intolerances.

	Allergies	Intolerances
Which system of the body is involved?		
How dangerous is a reaction?		
Does eating a small amount cause a reaction?		
Write some common foods that cause reactions.		

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Activity 25

Signs and symptoms



Complete the spider diagrams below by writing the signs and symptoms of food allergies and food intolerances.

Signs and symptoms of
food allergies

Signs and symptoms of
food intolerances

10.4 Food allergies and intolerances



Activity 26

Anaphylaxis



Read the following sentences about anaphylaxis. Fill in the blanks in each sentence using one of the words in brackets.

1. Anaphylaxis is a allergic reaction. (mild/severe)
2. Anyone experiencing anaphylaxis should get medical attention. (immediate/gradual)
3. Symptoms of anaphylaxis include problems with breathing, skin rashes, nausea and an increased rate. (heart/thinking)
4. If a person goes into shock, they should be treated with a/an (tablet/injection)
5. The injection containing comes in the form of an auto-injector. (paracetamol/adrenaline)
6. People with severe allergies should carry an adrenaline auto-injector with them. (always/never)

Notes:



11

End of unit quiz

1. What are foodborne illnesses?

.....

.....

.....

.....

.....

2. Explain the following types of cross-contamination:

a) Equipment-to-food

.....

.....

.....

.....

b) People-to-food

.....

.....

.....

.....

3. Match each of the five keys to safer food with their correct description.

Keep clean.	Store food in containers to avoid contact between raw and cooked foods.
Separate raw and cooked food.	Use clean water to cook and clean with.
Cook thoroughly.	Allow food to defrost in the fridge.
Keep food at safe temperatures.	Wash your hands before handling food and during preparation.
Use safe water and raw materials.	For meat and poultry, make sure the juices are clear and not pink.

4. Explain the difference between an allergy and an intolerance.

.....

.....

.....

.....

UNIT 11

Clinical nutrition

- 11.1** Therapeutic diets
- 11.2** Diet for overweight
- 11.3** Diabetes
- 11.4** Blood glucose monitoring
- 11.5** Diet for diabetes
- 11.6** Diet for renal disease
- 11.7** Diet for bone disease
- 11.8** Diet for heart disease

Introduction

Your body needs nutrients in order to survive. The amount of nutrients you need depend on many factors including your age, body size, activity level and medical conditions. When people have conditions such as heart disease and diabetes, they will need some nutrients in larger quantities than others. They may also need to reduce their intakes of other nutrients e.g. people with diabetes are advised to reduce their intake of sugar and fat.

In this unit, you will learn how to explore the role of therapeutic diets in the treatment of certain diseases. You will gain a deeper understanding of nutritional indices, nutritional assessment techniques and you will be able to use this information to advise on management of selected diseases including diabetes and heart disease. You will understand what foods are suitable for patients suffering from different diseases.



Learning outcomes

Standard HSC.4.3.01: Advise the appropriate diet for overweight individuals, patients with diabetes, renal disease, bone disease and heart disease.

Learning outcomes:

HSC.4.3.01.002	Outline the purpose of therapeutic diets.
HSC.4.3.01.001	Explain the dietary guidance for overweight individuals.
HSC.4.3.01.006	Identify the types and causes of diabetes.
HSC.4.3.01.004	Evaluate the methods of blood glucose monitoring.
HSC.4.3.01.007	Explain the dietary guidance for patients with diabetes.
HSC.4.3.01.008	Explain the dietary guidance for patients with renal disease.
HSC.4.3.01.009	Explain the dietary guidance for patients with bone disease.
HSC.4.3.01.010	Explain the dietary guidance for heart disease patients.

Keywords

Word	Form	Definition
abdominal	noun	the part of the body below the chest
consistency	noun	the quality of being thick, smooth, runny etc.
deficient	adjective	not having enough of something that is important or necessary
dysphagia	noun	the inability to swallow food
glucose	noun	a simple sugar that is the main energy source to the body
hormone	noun	a substance that is produced in the body
hypertension	noun	high blood pressure
insulin	noun	a hormone produced by the pancreas which regulates how much glucose is in the blood
intolerance	adjective	being unable to take a certain substance in the body without becoming sick
modification	noun	the process of changing parts of something
moist	adjective	slightly or barely wet; not completely dry
sodium	noun	a micronutrient otherwise known as salt
texture	noun	the way that a food or drink feels in your mouth
ulcer	noun	a painful, sore area inside or outside the body

11.1 Therapeutic diets

STARTER

Diseases

In pairs, make a list of diseases that you think would require a therapeutic diet to help with disease management. Also, mention the system of the body that is affected by each disease.

Disease	System of the body affected

What dietary changes do you think a person with diabetes would be advised to make?

.....

.....

.....

.....

.....



Activity 1

Odd one out



Read the following sentences about when a therapeutic diet is needed. One of them is false, circle the false one.

A therapeutic diet is needed for someone who has anorexia and needs to gain weight.

A therapeutic diet is needed for someone who has gluten intolerance.

A therapeutic diet is needed to cure COVID-19.

A therapeutic diet is needed for a stroke victim who lost the ability to chew their food.

A therapeutic diet is needed for someone who has hypertension.

Which of the true statements is the odd one out and why?

.....

.....

11.1 Therapeutic diets



Activity 2

Spider diagram



Draw a spider diagram showing some types of nutrient modifications.



Activity 3

Texture modification



Match the type of texture modification with the correct description.

Soft
Minced and moist
Puree

Foods are blended until smooth and lump free.
Food is can easily form into a ball, there may be soft lumps.
Food is naturally soft or boiled until soft.



Activity 4

Scenarios

Read the information about the following patients and decide which type of texture modification is appropriate for each.

1. Zainab has dementia and sometimes she forgets to fully chew her food. She tries to swallow large chunks of food which causes her to choke. Zainab has all of her teeth but sometimes she forgets to chew the harder chunks of food.

Texture modification required:

2. Ibrahim recently had a stroke. He cannot fully open his mouth or move it in a chewing motion. Ibrahim's brain does not always register when there is food in his mouth in order to open his oesophagus to allow food to pass to his stomach.

Texture modification required:

3. Mariam has multiple sclerosis. She has had a few choking incidents recently. Most of the time her mouth works fine, but sometimes she struggles with chewing food. Sometimes she does not experience dysphagia but it is very unpredictable.

Texture modification required:

4. Zayed has cancer of the mouth. He is undergoing treatment which has had many side effects. They include pain in the mouth, lack of saliva being produced and severe stiffness of the muscles in his mouth.

Texture modification required:

11.2 Diet for overweight

STARTER

What do you remember?

What can you remember about BMI? Complete the table below by writing the name of the BMI classification next to each of the scores.

BMI Score	BMI classification
<18.5	
18.5-24.9	
25-29.9	
>30	

Can you remember how BMI is calculated? What measurements are needed and how is it worked out? Circle your answers.

Circle the measurements that are needed.

weight	age	height	shoe size
--------	-----	--------	-----------

Circle the formula that is used.

$\frac{\text{age}}{\text{height}^2}$	$\frac{\text{shoe size}}{\text{weight}}$	$\frac{\text{weight}}{\text{height}^2}$	$\frac{\text{age}}{\text{weight}^2}$
--------------------------------------	--	---	--------------------------------------



Activity 5

Therapeutic diet for overweight



Which of the following types of therapeutic diets do you think is the most useful for someone who is overweight? Tick the correct answer.

Type of therapeutic diet	Tick
Additional feeding	
Nutrient modification	
Texture modification	
Tube feeding	
Food allergy/intolerance modification	



Activity 6

Energy balance formula



Write the formula below that is used to work out energy balance.

Energy balance = ... -

Name the three things that energy output includes.

1.
2.
3.

11.2 Diet for overweight



Activity 7

Energy balance



Calculate the energy balance for the following people.

Fatima

Energy input: 2167 kcal

BMR: 1285kcal

Physical activity: 420kcal

TEF: 103kcal

Does Fatima have positive or negative energy balance?

What changes will Fatima see over time if she continues to have this energy balance?

Sara

Energy input: 1845kcal

BMR: 1250kcal

Physical activity: 687kcal

TEF: 94kcal

Does Sara have positive or negative energy balance?

What changes will Sara see over time if she continues to have this energy balance?

Amal

Energy input: 2642kcal

BMR: 1428kcal

Physical activity: 397kcal

TEF: 128kcal

Does Amal have positive or negative energy balance?

What changes will Amal see over time if she continues to have this energy balance?

Amal has a BMI of 28. She wishes to reduce her BMI to a normal weight through diet and exercise.

What is her BMI classification?

What advice would you give to Amal to help her to reduce her BMI? Consider her energy balance and dietary recommendations overweight.

.....

.....

.....

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.....

11.2 Diet for overweight



Activity 8

Food diary



Have a look at Mansoor's food diary below. Mansoor has a BMI of 29 and he needs to lose weight. In the right column, write the dietary changes you would advise Mansoor to make.

Mansoor's food diary	Changes you suggest
Breakfast Pancakes (four pieces) Chocolate spread Turkish coffee	Breakfast
Lunch Chicken shawarma (two) Small fries Chips	Lunch
Dinner Fried chicken burger Large fries Large cola Doughnut	Dinner
Snacks Luqaimat (four pieces) Karak tea (three cups)	Snacks

Notes:

11.3 Diabetes

STARTER

What do you know about diabetes?

Have you heard the term diabetes before? What do you know about it? Answer the following questions about diabetes.

What is diabetes?

What causes diabetes?

How many types of diabetes are there?

Do you know anyone with diabetes?

How is diabetes treated?



Activity 9

Insulin

Insulin plays a very important role in regulating blood glucose. What is insulin and where does it come from? Fill in the blanks in the sentences below.

Insulin is a which is produced in the

The role of insulin is to control the amount of in the blood.



Activity 10

Draw a diagram

In the space below, draw a diagram which explains how insulin works in the body.

11.3 Diabetes



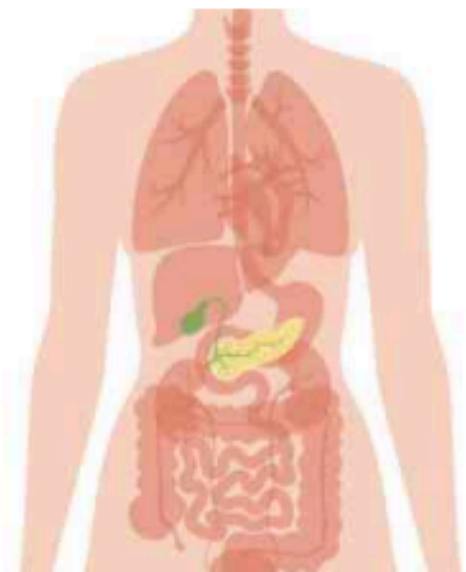
Research: The pancreas

Do some research on the pancreas and answer the following questions.

Which body system does the pancreas belong to?

.....

Label the pancreas on the image below.



You already know that the pancreas produces the hormone insulin. What other functions does it have?

.....

.....

.....

.....



Activity 11

Diabetes in the UAE

Read the following statement about diabetes in the UAE.

Currently, there are more than one million people in the UAE who have diabetes. This is expected to rise to two million in the next twenty years if people do not change their lifestyle habits.

In groups, create a plan that will help to reduce the number of diabetic people in the UAE in the next twenty years. An example of a plan could be to organise a diabetes awareness week in your school or local area. Explain your ideas in the space below.

11.3 Diabetes



Activity 12

Gestational diabetes

Complete the following tasks about gestational diabetes.

1. Explain how gestational diabetes is different to type 1 and type 2 diabetes.

.....

.....

.....

.....

2. List the risk factors for a woman developing gestational diabetes.

.....

.....

.....

.....



Research: Diabetes around the world

Research which countries have the highest number of diabetes cases around the world. Write them below.

.....

.....

.....

.....



Activity 15

Compare and contrast



Complete the table below by making a comparison between type 1 and type 2 diabetes.

	Type 1	Type 2
Age of onset		
Symptoms experienced		
Causes		
Severity of symptoms		

11.3 Diabetes



Research: Diabetes complications

Research the complications that can happen if diabetes is not managed well.

In the space below, write the name of each complication. Then give a brief description of it including how it happens and which part of the body it affects.

Name of complication:

.....

Description:

.....

.....

.....

.....

.....

Name of complication:

.....

Description:

.....

.....

.....

.....

.....

Name of complication:

Description:

Notes:

11.4 Blood glucose monitoring



Discussion: Measuring blood glucose

Have you ever had your blood glucose measured? Do you know the name of the method that was used to measure it? Describe your experience below.

If not, do you know anyone with diabetes who must measure their blood glucose? If so, how do they measure it?



Activity 14

When to measure blood glucose



How often should blood glucose be measured? Give examples of some of the times when it should be measured below.



Activity 15

True or false



Answer true or false to the following statements about CGM.

Statements	T/F
CGM tracks glucose levels 24 hours per day.	
CGM has five parts.	
CGM will alert a patient if their blood glucose levels are too high.	
The sensor wire can be worn for one month and then it must be replaced.	
CGM readings are normally identical to finger prick readings.	
CGM users are encouraged to do two finger-prick tests per day.	
CGM stands for continuous glucose monitoring.	



Activity 16

Explain the difference



Explain the difference between CGM and the finger prick test for measuring blood glucose levels.

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.....

11.4 Blood glucose monitoring



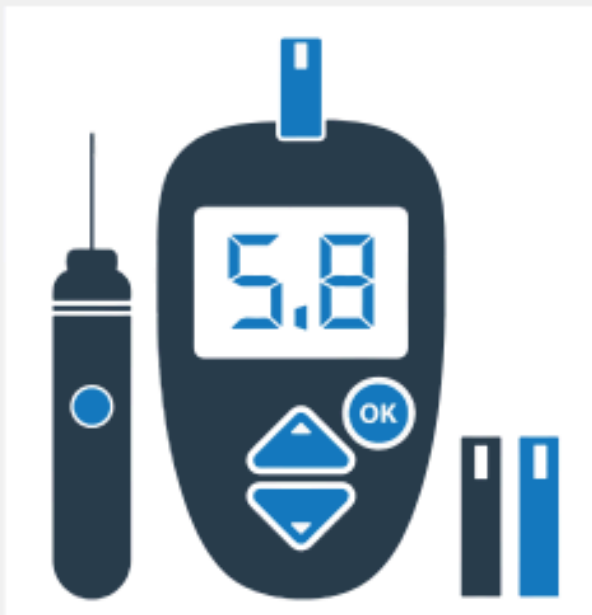
Activity 17

Label the items



Using the items in the list below, label the correct pieces of equipment which are used to measure blood glucose.

1. Lancet
2. Test strip
3. Lancing device
4. Blood glucose monitor



Name three other items that are needed to measure blood glucose.

.....

.....

.....



Activity 18

Measuring blood glucose

This is a practical activity. In pairs, you are going to measure your blood glucose levels. Your teacher will guide the class for this activity. Make sure you follow the steps for measuring blood glucose using a blood glucose monitor in your workbook.

What was your blood glucose reading from the glucose monitor?

.....

What does your reading suggest?

.....



Research: mmol/L

Research the meaning of mmol/L units. Write your answer below.

.....

.....

Notes:

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.....

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11.4 Blood glucose monitoring



Activity 19

Prediabetes



Noof had her blood glucose measured by a doctor after fasting for eight hours. Her reading was 6.8mmol/L.

What does this reading say about Noof's current condition?

.....

What lifestyle changes would you suggest for Noof to decrease her risk of developing type 2 diabetes in the future?

.....

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Notes:

11.5 Diet for diabetes

STARTER



Diabetes recap

Answer the following questions based on what you have learned so far about diabetes.

What is diabetes?

How many types of diabetes are there?

Name each type of diabetes.

Name some factors that cause diabetes to happen.



Activity 20

Carbohydrates



In your own words, explain why carbohydrates have the biggest impact on blood glucose levels.

.....

.....

.....

.....



Activity 21

Carbohydrates



In the spaces below, create a list of foods that are examples of simple carbohydrates and those which are examples of complex carbohydrates.

Simple carbohydrates

.....

.....

.....

.....

.....

Complex carbohydrates

.....

.....

.....

.....

.....

11.5 Diet for diabetes



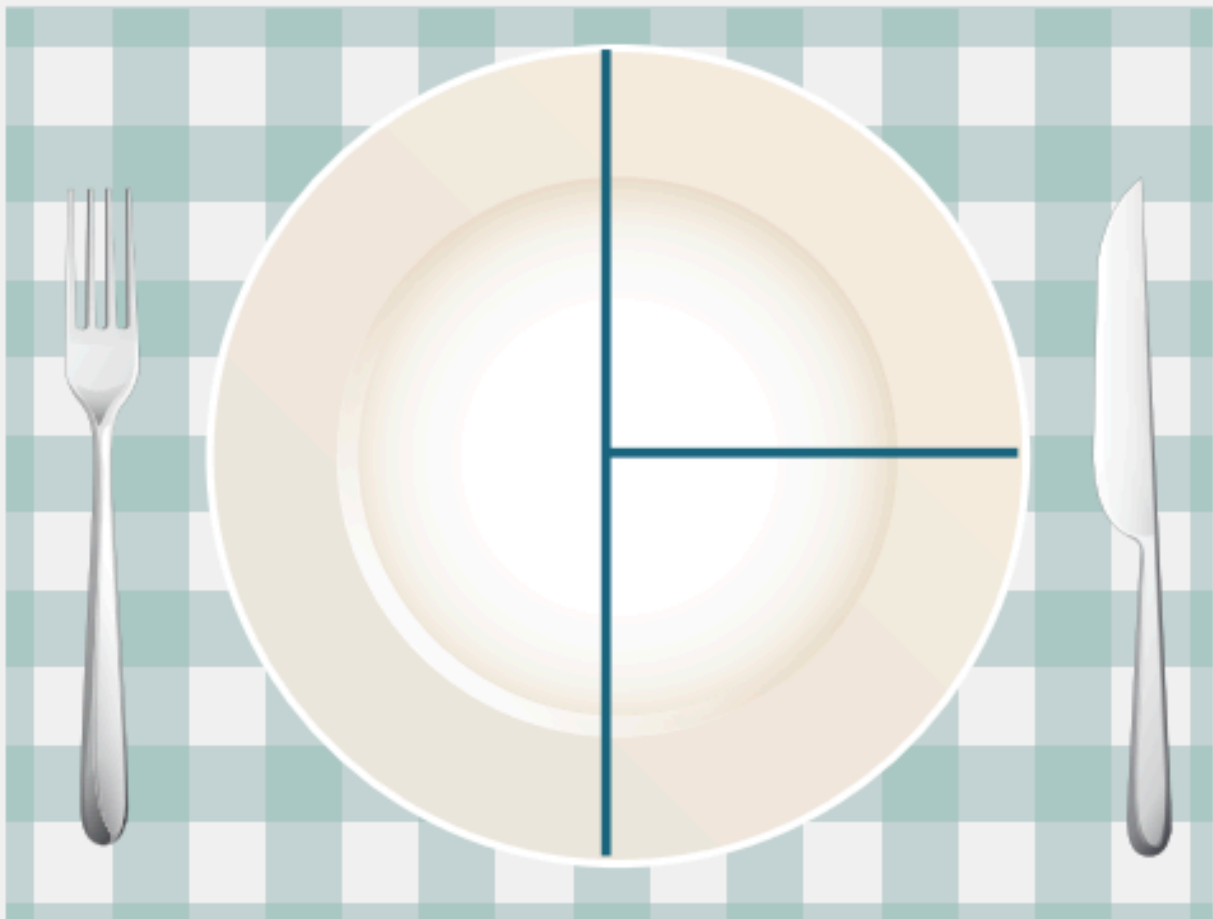
Activity 22

The plate method



Mohammed has type 2 diabetes. Since he was diagnosed with diabetes, he has noticed that he likes most fruits and vegetables. However, he dislikes tomatoes, onions, cauliflower and cucumber. He likes to eat seafood and lamb. Mohammed always drinks a cup of coffee in the morning and after lunch. He dislikes potatoes and wholegrain bread.

Mohammed would like you to design a lunch or dinner meal for him using the plate method. Keep in mind his likes and dislikes. Draw and label the foods you would give to Mohammed to eat.





Activity 25

Diabetes and overweight

Shahad has a BMI of 29 and a fasting blood glucose of 6.4mmol/L. Her doctor told her that unless she makes some diet and lifestyle changes, she is likely to develop type 2 diabetes in the next months.

Explain why Shahad is more likely to develop diabetes.

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.....

.....

.....

What dietary advice would you give to Shahad?

.....

.....

.....

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.....

.....

.....

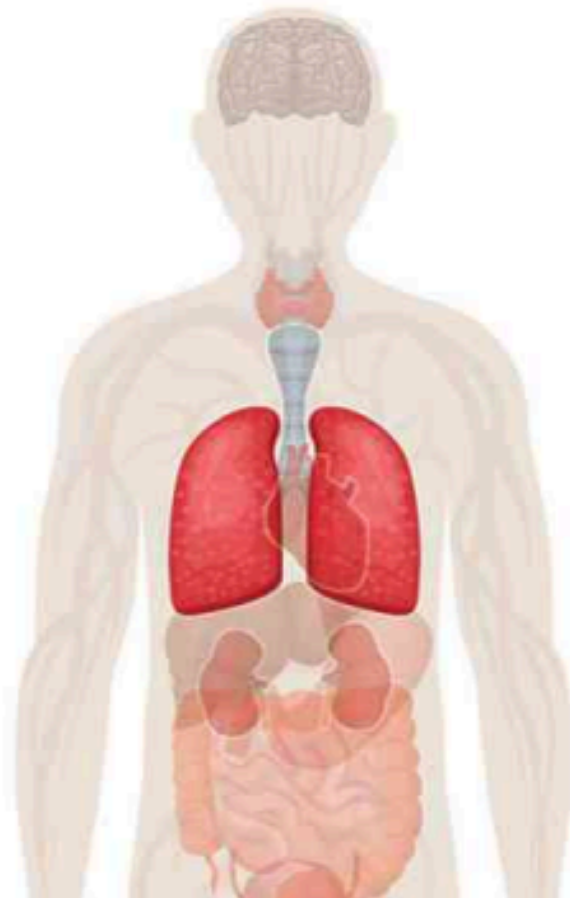
11.6 Diet for renal disease

STARTER



The kidneys

On the image of the human body below, label the kidneys.



What is the function of the kidneys?

.....

.....

.....



Activity 24

Matching



Match the following nutrients to their function in the human body.

Protein
Phosphorous
Potassium

Muscle function
Growth and repair of cells
Bone health

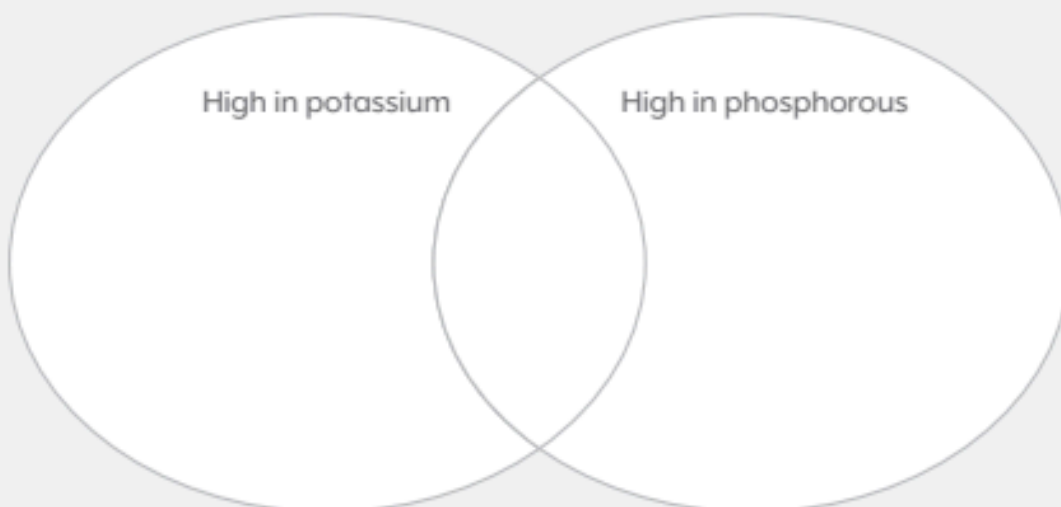


Activity 25

Venn diagram



Complete the Venn diagram below by writing the names of foods that are high in potassium, high in phosphorous and high in both.



11.6 Diet for renal disease



Activity 26

The ideal diet



In the space below, design a one-day meal plan for a patient with renal disease. The meal plan you design should include breakfast, lunch, dinner and snacks. Don't forget to include any drinks with each meal.

Breakfast

Lunch

Dinner

Snacks

Notes:

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11.7 Diet for bone disease

STARTER The bones

Answer the following questions about the bones of the human body.

1. How many bones are there in the human body?

.....

2. Where would you find the largest bone in the human body? Do you know its name?

.....

3. Where would you find the smallest bone in the human body? Do you know its name?

.....

4. Name the following bones.





Activity 27

Osteoporosis and osteopenia

Use the space below to describe the difference between osteoporosis and osteopenia in your own words.

.....

.....

.....

.....

.....

.....



Research: Lactose intolerance

Do some research about lactose intolerance and explain what it is below.

.....

.....

.....

Nasser has osteopenia but he is also lactose intolerant. Suggest some foods for Nasser to eat to increase his calcium intake.

.....

.....

.....

.....

11.7 Diet for bone disease



Activity 28

A calcium-rich breakfast



In the space below, design a calcium-rich breakfast for Salem who has osteoporosis.

Foods:

Drinks:



Activity 29

Vitamin D



Approximately 86% of the people in the UAE are said to have a vitamin D deficiency. Suggest some reasons for this.

.....

.....

.....

.....



Activity 30

Foods to avoid



Read the following sentences and choose which one is correct by putting a tick in the box beside it.

Too much caffeine reduces the absorption of vitamin D.	
Too much calcium reduces the absorption of caffeine.	
Too much caffeine reduces the absorption of calcium.	

Name some other foods that should be eaten less to reduce the risk of developing osteoporosis.

.....

.....

.....

.....

.....



Research: Another bone disease

Research another type of bone disease. Explain how it is caused and what effects it has on the body.

.....

.....

.....

.....

11.8 Diet for heart disease

STARTER



What can you remember

What can you remember about heart disease from previous Health Sciences units? Answer the following questions.

Name some diseases of the heart.

Name some dietary recommendations for a person who has heart disease.

Name some lifestyle recommendations for a person who has heart disease.



Activity 31

Fats



Complete the following with the correct information about fats.

Healthy fats

Select the types of fats in this group:

Unsaturated / Saturated / Trans

Examples of healthy fats:

.....

.....

.....

Unhealthy fats

Select the types of fats in this group:

Unsaturated / Saturated / Trans

Examples of Unhealthy fats:

.....

.....

.....

11.8 Diet for heart disease



Research: Cholesterol

Do some research about cholesterol and answer the following questions.

What is cholesterol?

.....

.....

.....

Where does cholesterol come from?

.....

.....

.....

What happens to people with high cholesterol?

.....

.....

.....

How do healthcare professionals measure cholesterol?

.....

.....

.....



Activity 32

Blood pressure



As well as reducing the amount of unhealthy fats in a diet, the intake of something else should be reduced. Read the following clues to work out what it is.

- ⊙ It is a mineral.
- ⊙ Eating too much of this increases blood pressure.
- ⊙ It is often written as 'sodium' on food labels.
- ⊙ It is usually added to foods for flavour during cooking.

What is it?

.....

What is the recommended daily allowance for this mineral?

.....

Name some foods that contain high levels of this mineral.

.....

.....

.....

.....

.....

.....

.....

11.8 Diet for heart disease



Activity 33

The DASH diet



Answer the following questions about the DASH diet.

What does DASH stand for?

D.....
A.....
S.....
H.....

Who is the DASH diet recommended for?

.....
.....

What is the main difference between the DASH diet and a regular diet?

.....
.....

Notes:

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Activity 34

DASH diet recommendations

Mahmoud has hypertension. His doctor has recommended him to follow the DASH diet to manage his condition. Mahmoud has been advised to reduce his weight and therefore eat a maximum of 2000 calories per day.

Write the recommended servings per day of each of the food groups below that Mahmoud should eat when following the DASH diet.

Food group	Servings per day
Grains	
Fruit	
Vegetables	
Milk and dairy products	
Lean meat, poultry and fish	
Nuts, seeds and legumes	

Notes:

End of unit quiz

1. Write the formula to calculate energy balance.

.....

.....

2. Answer true or false to the following questions about diabetes.

	True or false
Diabetes is a communicable disease.	
Men can get gestational diabetes.	
Type 2 diabetes is more common than type 1.	
The pancreas produces a hormone called insulin.	
Having gestational diabetes increases the chance of developing type 2 diabetes.	

3. Name the methods of measuring blood glucose.

.....

.....

4. Which three nutrients should someone with renal disease reduce?

.....

.....

.....

5. Explain the relationship between calcium and vitamin D.

.....

.....

.....

.....

6. The DASH diet may be recommended to someone with which disease?

.....

7. What dietary advice would you give to someone with heart disease?

.....

.....

.....

Notes:

Notes:

UNIT 12

Mass casualty incidents

- 12.1** Mass casualty incidents
- 12.2** Mass casualty incident management
- 12.3** Triage
- 12.4** Actions to take during a disaster
- 12.5** Actions to take after a disaster

Introduction

Mass casualty incidents are emergencies in which the number of casualties is more than the emergency medical resources available. During a disaster or emergency, knowing what to do or where to go could save your own, or other peoples' lives. In mass casualty situations, triage is a method that is used to decide who is most urgently in need of medical care and transportation to hospital.

In this unit you will learn about the causes of mass casualty incidents and some of the emergency situations that affect the United Arab Emirates. You will explore the actions to take if you are ever in this kind of situation.



Learning outcomes

Standard HSC.3.8.01: Identify the correct actions to take during and after a mass casualty incident

Learning outcomes:

HSC.3.8.01.001	Describe what a mass casualty incident is.
HSC.3.8.01.002	Identify mass casualty management techniques.
HSC.3.8.01.003	Summarise the components of basic triage.
HSC.3.8.01.004	Identify the correct actions to take during a disaster.
HSC.3.8.01.005	Describe the actions to take after a disaster.

Keywords

Word	Form	Definition
assess	verb	to make a judgement about something, for example how dangerous a situation is
avoid	verb	to stay away from something, or prevent something happening
cardiopulmonary resuscitation (CPR)	noun	a way of trying to save the life of someone who has stopped breathing and whose heart has stopped beating
casualties	noun	people hurt by an event or incident
challenging	adjective	something that tests a person's ability
collapse	verb	to break apart and fall down suddenly
damage	verb	to spoil or harm a person or thing
dangerous	adjective	likely to cause harm; unsafe
disaster	noun	an unexpected event that hurts or kills people and causes a lot of damage
hazard	noun	a source of danger
identify	verb	to know who or what someone or something is
incident	verb	an unexpected and usually unpleasant thing that happens
injured	adjective	harmed or damaged
management	noun	the act or skill of controlling and making decisions about a situation
paramedic	noun	a person whose job is to provide emergency medical care
prioritise	verb	to put in order of importance
scene	noun	the place of an event or action
severe	adjective	something very bad, dangerous or unpleasant
situation	noun	something that is happening at a particular time in a particular place
structure	noun	a building or object made from several parts
survival	noun	continuing to live or exist
technique	noun	a way of doing something
triage	noun	the process of deciding which patients should be treated first based on how sick or injured they are
unstable	adjective	not secure, something that is not fixed firmly
volunteer	noun	a person who offers to help with something

12.1 Mass casualty incidents



Discussion: Mass casualty incidents

What do you think a mass casualty incident is? Can you think of any examples? Discuss as a class and make notes below.

.....

.....

.....

.....

.....

.....

.....

.....



Activity 1

Description of a MCI



In your own words, describe a mass casualty incident.

.....

.....

.....

.....

.....

.....



Activity 2

Natural or man-made disaster?



Think of some different types of disasters. Decide if they are natural or man-made. Write them under the correct heading in the table.

Natural disasters	Man-made disasters



Activity 3

Other causes of MCIs



Can you think of any other natural or man-made causes of mass casualty incidents?

12.1 Mass casualty incidents



Activity 4

Fill in the blanks



Fill in the blanks about mass casualty incidents using the words below.

scene	training	casualty	safe	dangerous
-------	----------	----------	------	-----------

At a mass incident, it is important to check for hazards or dangers. If you are the first person to arrive at the, you should look around for threats to your own and other people's safety.

If any of these threats are present, you should not approach the area. Stay in a place and call 999/998. Leave situations to the emergency services. They have had to deal with these kinds of incidents.

Notes:

.....

.....

.....

.....

.....

.....

.....

.....



Activity 5

Your own safety



Why should you always put your own safety first if you are at the scene of an accident? Think of two reasons and write them below.

1.

2.



Activity 6

Is it safe?



Look at the pictures below. Decide if you think it is safe to enter the scene (area) or not. Write yes or no and the reason why you chose your answer.

	Yes or no	Reason
		
		
		

12.1 Mass casualty incidents



Research: Natural disasters

Work in groups. Using the QR code below, follow the link to the ReliefWeb website. Choose the 'disasters' heading. Then, do some research into any natural disaster that happened in January 2021. Prepare a presentation for your class.



Include the following in your presentation:

- ⦿ What type of disaster was it?
- ⦿ Where did it happen?
- ⦿ How many people were injured or killed?
- ⦿ Was there any damage to buildings, roads or other structures?

Make notes below:

.....

.....

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.....

Notes:

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12.2 Mass casualty incident management

STARTER Word search

Complete the word search to learn the keywords about mass casualty incident management.

M	B	I	B	A	V	L	E	C	M	S	E	A	Y	F
Y	E	J	U	B	J	T	K	A	A	N	X	F	K	H
A	H	N	M	E	A	D	N	S	H	E	G	W	Q	C
B	C	A	R	U	R	A	M	U	K	M	C	F	K	H
Q	Z	C	L	M	G	E	H	A	V	U	C	S	G	V
E	X	A	E	E	S	N	E	L	E	S	W	Q	L	R
D	V	U	M	S	J	T	P	T	M	H	G	M	U	N
E	L	E	W	T	S	V	A	I	N	E	U	F	W	O
I	N	J	U	R	I	E	S	E	E	U	O	T	W	I
T	H	R	E	D	N	A	T	S	Y	B	L	Y	Q	T
G	K	J	O	L	H	L	F	V	H	I	F	O	F	A
E	U	Z	Z	F	X	Z	C	T	Y	J	S	P	V	C
H	R	V	E	Y	W	G	M	Y	N	R	M	H	J	O
I	X	B	F	P	Z	P	T	X	P	F	W	B	U	L
X	G	P	G	O	D	M	J	G	F	C	F	T	Z	N

LOCATION	CASUALTIES	ACCESS	BYSTANDER
MANAGEMENT	VOLUNTEER	EVALUATE	INJURIES



Discussion: What should you do?

What do you think you should do if you are the first person at the scene of a mass casualty incident? Discuss with your class and make notes below.

.....

.....

.....

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.....

.....



Activity 7

The two priorities in a mass casualty incident

Write a short sentence to describe the two priorities in a mass casualty situation.

Priority 1:

.....

.....

.....

Priority 2:

.....

.....

.....

12.2 Mass casualty incident management



Activity 8

Finish the sentences



Use the textbook to finish the sentences about managing a mass casualty incident.

The first thing to do in a MCI is to	
A priority is something that needs to be done or dealt with	
Call 999	
Fires, smoke and moving traffic could	
Tell the emergency services	



Activity 9

Calling the emergency services

Look at the picture. What would you tell the emergency services about the incident?
Answer the questions below.



Describe the area where this incident has happened.

.....

.....

.....

What has happened? What type of incident is it?

.....

.....

The number of casualties: How many people do you think might be hurt?

.....

.....

12.2 Mass casualty incident management



Activity 10

ABCDEF mass casualty management



Next to each description, write what part of ABCDEF disaster management is being referred to.

These are very common in mass casualty incidents. If it is safe, you can use an extinguisher to put it out.

This means to think about what equipment and resources you need.

These include falling buildings, damaged roads and fallen trees.

Smoke or fumes in the area of a mass casualty incident could affect this.

These things are dangerous as they can still be moving around you. Signal for them to stop.

These are one of the most dangerous things in a MCI. They can kill people who touch them.



Activity 11

Providing first aid

Work in pairs or small groups to answer the following questions about providing first aid in a mass casualty incident.

Why is it important to provide first aid for injured people?

.....

.....

.....

.....

List the different types of first aid procedures that may be needed in a mass casualty incident.

1.
2.
3.
4.
5.

Can you think of any other first aid procedures that might need to be used in a mass casualty incident? Write them below.

.....

.....

.....

.....

12.2 Mass casualty incident management



Activity 12

Disaster management in the UAE

Work in groups. In your textbook, read about the UAE's National Emergency Crisis and Disasters Management Authority's project to notify the public if there is an emergency.

Can you think of any other ideas or innovations that could be used to keep people and properties safe from any type of emergency or disaster in the UAE?

Write any ideas that your group has below. Then, share the ideas with the class.

.....

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Notes:

12.3 Triage



Discussion: Triage

Have you heard the term triage before? What do you think it means? Discuss with your class and make notes below.

.....

.....

.....

.....

.....

.....



Activity 13

What should you do?

Triage is the process of deciding the order of treatment for casualties after an incident. After making sure that you are not in any danger, what **two** things should you do?

Write your answers below

1.
2.



Activity 14

The SALT triage method



What do the letters of SALT stand for? Write your answers below.

S

A

L

T



Activity 15

Step 1: Sort



Fill in the missing parts of the table.

Sort	Walkers Assess
	Wavers Assess
	Still Assess

12.3 Triage



Activity 16

Step 2 and 3 of SALT



Answer the questions about step 2 and step 3 of SALT triage.

What is step 2 of SALT?

.....

What is step 3 of SALT?

.....

When making a casualty assessment, what should you check?

.....

.....

.....

How long should you spend with each casualty?

.....

If casualties have injuries that could cause them to die, what should you do?

.....

.....

.....

Once you have assessed or given first aid to one person, what should you do next?

.....

.....

.....



Activity 17

Categorising casualties



Look at the list of injuries/conditions in the table below. Then, draw a line to the correct triage category that you think they should be given.

minor cuts
broken bones
dead
minor fractures
cardiac arrest
major trauma injuries
flesh wounds
possible head injury
uncontrollable bleeding
sprains
minor amputations
minor burns
major burns

RED
YELLOW
GREEN
BLACK

12.3 Triage



Activity 18

Category and treatment



Work in groups. Look at the examples of injuries below. You must decide which triage category (red, yellow, green or black) each person belongs in based on their injury. Then try to think of what first aid treatment you would give each person using your knowledge of first aid.

Casualty one

The casualty has a deep cut to their arm. They have lost a lot of blood and the bleeding is not stopping.



Which triage category should this person be in?

.....

Why did you choose that category?

.....

What first aid treatment should they receive?

.....

.....

.....

Casualty two

This casualty hurt his head in a car accident. He has some swelling and a bruise on his head. He seems confused and does not remember what happened.



Which triage category should this person be in?

.....

Why did you choose that category?

.....

.....

What first aid treatment should they receive?

.....

.....

.....

12.3 Triage

Casualty three

This casualty has hurt their hand in an accident. They have a small cut on their finger which is bleeding a little. They are able to move around by themselves.



Which triage category should this person be in?

.....

Why did you choose that category?

.....

.....

What first aid treatment should they receive?

.....

.....

.....

Casualty four

This casualty has been in a very bad car accident. He has been thrown into the road and has many injuries. He has severe bleeding and broken bones. He is not breathing, has no pulse and is unresponsive. Other people at the scene say that this person has not moved since the accident happened 20 minutes ago.



Which triage category should this person be in?

.....

Why did you choose that category?

.....

.....

What first aid treatment should they receive?

.....

.....

.....

12.4 Actions to take during a disaster



Discussion: Identify different disasters

Discuss the different types of disaster that you learned about earlier in this unit. Remember that they can be natural or man-made. Write as many types of disaster as you can remember.

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.



Research: Natural disasters in the region

Research some of the natural disasters that can happen in the United Arab Emirates and the surrounding areas. Write your findings below.

.....

.....

.....

.....

.....



Activity 19

Fill in the blanks

Fill in the blanks about earthquakes using the words below

landslides	sudden	Earthquakes	structures	tsunamis.
------------	--------	-------------	------------	-----------

An earthquake is a violent shaking of the ground, as a result of movements within the earth's crust.

It is not the shaking that is dangerous. It is the effect that the shaking has on everything around it.

..... can cause buildings and other such as bridges to shake and fall, and roads to split or crack.

They can cause and rockfalls in mountain areas.

Massive waves called can happen if an earthquake happens under the sea.



Activity 20

Actions to take during an earthquake

Write the steps to take during an earthquake in the boxes below.

Step	You should:
1	
2	
3	
4	
5	

12.4 Actions to take during a disaster



Activity 21

Drop, cover and hold



Look at the pictures below. Write a description of what is happening in the box next to each picture.



Notes:



Activity 22

Demonstrate 'drop, cover and hold'



When your teacher gives the instruction, demonstrate the 'drop, cover and hold' technique.

Your teacher will either shout:

1. With cover:

You must demonstrate the correct technique using any cover that is available in the classroom.

2. Without cover:

Demonstrate what you would do if there was no cover available.

Answer the questions:

1. What did you use for cover?

.....

.....

Why?

.....

.....

2. What did you do when there was no cover?

.....

.....

Why?

.....

.....

12.4 Actions to take during a disaster



Activity 23

Driving during floods



Answer the following questions about driving during a storm or flood.

1. Instead of driving into an area where heavy rain or flooding is predicted, what could you do?

.....

2. If you cannot see the road in front of you because of heavy rain, you should pull over and stop where?

.....

3. Do not drive through water that is more than how deep?

.....

4. If you must drive through shallow water, how should you drive?

.....

5. Once you are through the water, what should you check?

.....



Activity 24

Wadi floods



What advice should you follow if you are near a wadi and it is raining heavily? Write yes or no.

Park your car at the bottom of the wadi.	
Stay away from the area of wadis if it is raining.	
Watch and listen for weather changes.	
If there is an emergency, call your friends to help you.	
Do not park your car in valleys or near wadis if it is raining.	
Do not walk by, or try to cross, fast flowing or high water.	



Discussion: Sandstorms

What do you think you should do to protect yourself during a sandstorm?
Discuss in small groups.

Write or draw some advice you would give to people about sandstorms in the space below.

12.5 Actions to take after a disaster



Discussion: What should you do or not do?

What things do you think you should do or not do after a disaster? Discuss with your class and make a list below.

Things you should do

Things you should not do



Activity 25

After a disaster



Answer the questions about staying safe after a disaster.
What might still be present after a disaster?

.....

.....

If you are not injured after a disaster what can you begin to do?

.....

.....



Activity 26

Safe places inside a building



Look at the three sentences. Next to each, circle yes if you think it is safe, and no if you think it is not safe. Then write a reason for your answer.

The safest place to be inside a building during an earthquake or explosion is the kitchen. Yes or no

Reason:

.....

.....

The safest place to be inside a building during an earthquake or explosion is near the window. Yes or no

Reason:

.....

.....

The safest place to be inside a building during an earthquake or explosion is under a piece of solid furniture such as a table. Yes or no

Reason:

.....

.....

12.5 Actions to take after a disaster



Activity 27

Safe areas outside



Can you think of an outside area close to where you are now that would be safe in a disaster? Write your answer and the reason why below.

.....

.....



Activity 28

Falling hazards



Think about different types of objects that could fall inside or outside during an earthquake or other disaster. Put them under the correct heading in the table.

Indoor falling hazards

Outdoor falling hazards



Activity 29

The best place to be



Circle which picture you think shows the best place to be after a disaster.



12.5 Actions to take after a disaster



Activity 30

Actions if you are outside



In the space provided, write an answer about what you should do after a disaster.

Once the disaster is over, you should move to:

You should instruct (tell) other people to:

If there is a busy road nearby, you should:

If there are aftershocks, you should:

You should call:

If there are injured people around you, you should:



Activity 3J

Case studies



Read the case study and then decide what you would do. Write your answers in the spaces below.

Case study 1:

There has been an earthquake. When it happened, you were in your classroom. The shaking has stopped. What would you do?

.....

.....

.....

Case study 2:

After an earthquake you are making your way to a safe area when the ground starts shaking again. What would you do?

.....

.....

.....

Case study 3:

You are leaving a building after an earthquake when you see someone who looks injured lying on the ground. Near to where they are lying the building is on fire. What would you do?

.....

.....

.....

12.5 Actions to take after a disaster



Activity 32

Driving during and after a disaster



If you are driving during or after an earthquake, which actions should you take? Read the statements and select true or false.

Statements	True	False
Do not drive over any cracks or bumps in the road.		
Stop as soon as you can.		
Get out of your car or vehicle.		
Continue driving.		
Avoid structures such as buildings, bridges, flyovers, or powerlines.		
Use your car to block the road.		



Activity 33

Stopping your vehicle



Why do you think it is not a good idea to stop your car on a bridge or under a flyover during an earthquake?

.....

.....

.....

.....

.....

.....

Notes:

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End of unit quiz

1. What is a mass casualty incident (MCI)?

.....

.....

.....

2. Write two natural and two man-made disasters.

Natural:

.....

.....

Man-made:

.....

.....

3. When you arrive the scene of an accident, what do you think is the most important thing to do? Circle your answer.

Manage the dangers and hazards.

Help injured people even if it is dangerous.

4. Write what each of the four triage categories means.

Red

.....

.....

Yellow

.....

.....

Green

.....

.....

Black

.....

.....

5. During an earthquake or explosion write what you should do if:

you are inside a building?

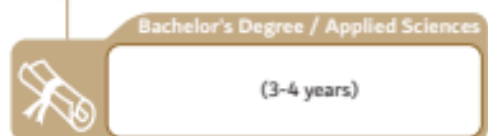
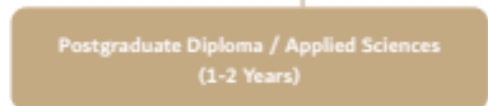
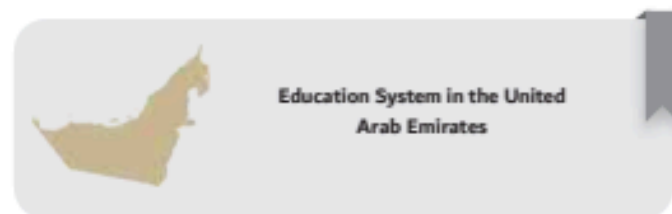
.....

you are outside?

.....

Notes:

Notes:



Guideline



