Baraem Al Ain Privste School - Baniyas

All Classes, From KG to Grade12, Boys & Girls
Licence No. 130, 1985

مدرسة براعم العين الخاصة – بني ياس

جميع المراحل من الروضة حتى المرحلة الثانوية العامة بنين + بنات
ترخيص رقم : 130 لسنة 1985

قسم العلوم
Science Department

EXAM EOT 3 EXAMPLE SOLUTION:

GRADE: 12 – ADV - GIRLS
TEACHER: ARWA ABDELMONEIM

Q: A. Identify nutrients needed by the body to prevent disease

1

Healthy diet

You already know that having a healthy, balanced diet is important to help your body stay healthy and get all of the nutrients that it needs. A healthy diet can also help to prevent diseases.

Here are some of the ways that having a healthy diet can reduce the risk of certain diseases.

Maintaining a healthy weight

Being overweight or obese is a risk factor for many diseases such as cardiovascular disease or diabetes. Being overweight puts pressure on the body's organs and blood vessels which can lead to a heart attack or stroke. Too much fat in the diet can cause diabetes.

Select **healthy food to control your weight**

0 | 100

WEIGHT

Making healthy food choices and being a healthy weight for your age and gender can reduce the risk of developing these and other diseases.

Consuming enough nutrients

Nutrients that the body needs include protein, healthy fats, carbohydrates, vitamins and minerals. Not including enough of the right nutrients in the diet can increase a person's risk of certain diseases.

EX

Example

Calcium is a mineral that the body needs to build healthy bones. Without enough calcium, a person could develop a disease of the bones called osteoporosis where their bones become weak. Consuming enough calcium-rich foods such as milk, cheese and yoghurt help to prevent osteoporosis.

Q: A. Why do we need calcium in our diets?
  B. Name a disease of the skeletal system.

1

2 **Q:** Evaluate individual dietary intake to assess nutritional status.

6.6 Dietary methods

Dietary intakes

The letter D in ABCDE stands for dietary intakes.

This is where the patient must record their eating patterns or the food and drinks that they consumed in a given period of time. Nutritional assessment is completed by healthcare professionals who consider the foods eaten, and patterns of consumption. This method of dietary assessment relies on the honesty of the patient to accurately record the correct foods, the correct cooking methods and amounts eaten.

Recording dietary intakes

Three of the most common ways to measure dietary intake are:

- Twenty-four-hour dietary recall
- Three-day food diary
- Food frequency questionnaire

2

A: Dietary methods

Dietary intakes

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3 **Q: A.** Describe the rationale for using PPE in a medical setting.

Personal protective equipment (PPE)

Personal protective equipment (PPE) can help protect the healthcare professional from catching an infection from the patient.

PPE for a healthcare setting can include:

- gloves
- masks
- gowns
- overalls
- eye protection

Think

Because of the coronavirus pandemic, hospitals and healthcare facilities have been working hard to protect their patients and staff from the infection. There are extra screening checks, more protective equipment being used and more strict hygiene measures in place.

3

Q: A. Give an example of PPE.
B. Why do doctors wear PPE?

Personal protective equipment (PPE)

Personal protective equipment (PPE) can help protect the healthcare professional from catching an infection from the patient.

PPE for a healthcare setting can include:

⊙ gloves
⊙ masks
⊙ gowns
⊙ overalls
⊙ eye protection

4 **Q: A.** List the causes of infections.

5.6 Infection control for disease prevention

How infections spread

An infection occurs when germs enter the body and multiply. Certain diseases are very infectious, this means that they can spread easily from one person to another.

Keyword

infection

a disease caused by germs that enter the body

Three things are needed for an infection to spread:

A Source: This is where germs are found and can include surfaces in the home or public places and on the skin.

A person: with a way for the germs to enter their body

Transmission: the way germs are moved to a person

What causes healthcare infections?

Bacteria, fungi, and viruses can cause healthcare infections.

They are mainly spread through person-to-person contact such as unclean hands or unclean medical equipment such as needles.

People who are already sick are at more risk of developing healthcare infections.

Antibiotic resistance

Antibiotics are a medication designed to kill bacteria and prevent infections from spreading. If over time antibiotics are overused, they are no longer as effective in killing bacteria. This is called antibiotic resistance. This can increase the chance of infection spreading from person to person.

What is infection prevention and control?

Infection prevention and control is an approach that aims to prevent patients and healthcare workers being harmed by avoidable infections.

bacteria   Viruses

fungi

4

Activity 32

Causes of healthcare infections

Identify the causes of healthcare infections.

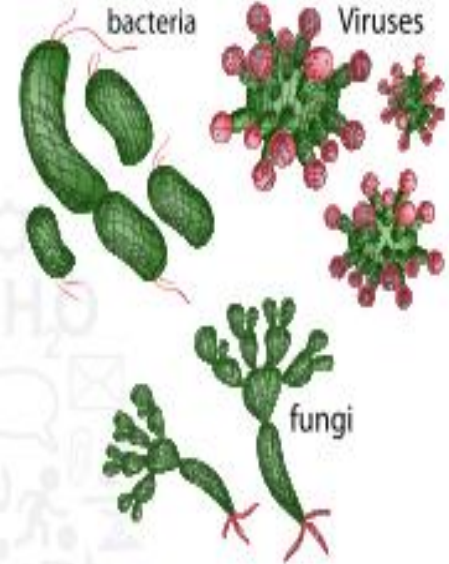|	
What can cause healthcare infections?	Bacteria, fungi, and viruses can cause healthcare infections.
Healthcare infections are usually spread by:	They are mainly spread through person-to-person contact such as unclean hands or unclean medical equipment such as needles.
People are more at risk of healthcare infections if they are:	People who are already sick are at more risk of developing healthcare infections.

4

Q: A. What causes healthcare infections?

B. What three things are needed for an infection to spread?

Three things are needed for an infection to spread:

A Source: This is where germs are found and can include surfaces in the home or public places and on the skin.

A person: with a way for the germs to enter their body

Transmission: the way germs are moved to a person

What causes healthcare infections?

Bacteria, fungi, and viruses can cause healthcare infections.

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People who are already sick are at more risk of developing healthcare infections.

bacteria

Viruses

fungi

5
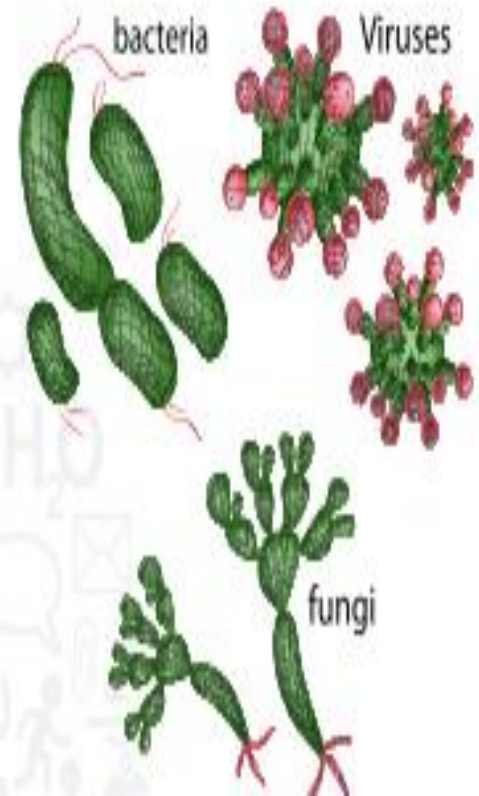
Q: A. Connect the importance of personal health behaviours such as a healthy diet, adequate sleep and personal hygiene with the prevention of illness and disease.

5.1 The causes of disease and illness

What is a disease or illness?

A disease or an illness is a medical condition that stops a person's body from working properly. There are many reasons why people might develop a disease. For example, genetics, environmental factors, or a person's lifestyle can all be reasons why they might develop a disease or illness.

Knowing some of the things that cause disease and illness and taking some steps to prevent them can help a person to stay healthy.

Disease prevention

Disease prevention means stopping or lowering the chance of getting a disease or illness.

The best way that people can lower their risk of disease is by:

- ⊙ living a healthy lifestyle.
- ⊙ practicing good personal hygiene.
- ⊙ having regular medical check-ups.

Keyword

prevent

to stop something from happening

5

Activity 15 — The importance of personal hygiene

In the boxes below, write three reasons why personal hygiene is important.

1. killing bad bacteria (germs).

2. keeping the body clean and healthy.

3. stopping the spread of illness and infection.

Activity 16 — Fill in the blanks

Fill in the blanks about personal hygiene using the words below.

spreading	shower	bacteria
smell	hands	morning

When you wake up in the .... morning .... , you should brush your teeth, take a .... shower .... , wash your body, and put on clean clothes.

If you don't practise good personal hygiene, then dirt and .... bacteria .... could build up on your body and cause it to .... smell .... bad, or the skin to become infected and sore.

Keeping your body and .... hands .... clean also helps to stop bacteria and viruses from .... spreading ....

Q: A. What is disease prevention?
B. How can diseases be prevented?

Disease prevention

Disease prevention means stopping or lowering the chance of getting a disease or illness.

The best way that people can lower their risk of disease is by:

- ⊙ living a healthy lifestyle.
- ⊙ practicing good personal hygiene.
- ⊙ having regular medical check-ups.

6

Q: A. Analyse the categories of BMI.

6.3 Body mass index (BMI) and body fat percentage

You can see from the information on the previous page, people with higher BMIs are overweight or obese. People who have a high BMI are more likely to develop non-communicable diseases like diabetes and heart disease.

Underweight

A BMI result lower than 18.5 is a sign that the person is underweight. In this case, the person should speak to a healthcare professional about gaining weight in a healthy way.

Healthy weight

A BMI between 18.5 and 24.9 is a sign that the person is a healthy weight. They should aim to maintain this weight by eating a healthy, balanced diet.

Overweight

A BMI result between 25 and 29.9 is a sign that the person is overweight. They should consider talking to a healthcare professional about losing some weight in a healthy way.

Obese

There are different levels of obesity, but any BMI above 30 is classed as being obese. A person with a BMI of more than 30 should seek professional help as they need to reduce their weight.

Reliability of BMI

BMI ranges

Write the correct BMI range (numbers) beside each classification of BMI.

BMI classification	BMI
Underweight	Less than 18
Normal	18.5 – 24.9
Overweight	25 – 29.9
Obese	20 – 34.9

The image below shows two men. Both men have a BMI of 32.

What is the BMI classification of someone with a BMI of 32?

obese

Do you agree that this weight status is the correct label for both men? Explain your answer.

No, because some times based on the BMI the person could be obese but their body fat percentage could be quite low because he has a lot of muscles

What else should you measure to achieve a more accurate result?

Body fat percentage

6

Q: A. What is the advice for someone who is overweight?
B. Describe the advice for someone whose BMI is healthy?

Overweight

A BMI result between 25 and 29.9 is a sign that the person is overweight. They should consider talking to a healthcare professional about losing some weight in a healthy way.

Healthy weight

A BMI between 18.5 and 24.9 is a sign that the person is a healthy weight. They should aim to maintain this weight by eating a healthy, balanced diet.

7   **Q: A.** Differentiate between communicable and non-communicable diseases

Communicable diseases

Keyword

bacteria

microorganisms that cause disease or illness

Communicable diseases are caused by bacteria, viruses and parasites which can be spread from one person to another. They can be spread through contact with an infected person, through contaminated food or drinks, through insect bites or the air.

Example

COVID-19 is an infectious communicable disease. It is spread through contact with people who are sick. It causes a fever, dry cough, and sore throat. In extreme cases, coronavirus can lead to death.

You can help to prevent communicable diseases by:

⊙ practising good personal hygiene.
⊙ cleaning and disinfecting shared areas.
⊙ keeping a safe distance from people who are unwell.

Further information

Having a healthy lifestyle can help to prevent you from getting some communicable diseases or getting very unwell from a communicable disease. This is because if you are healthy your body's immune system could be more able to 'fight' the bacteria and viruses. You can help your immune system stay healthy by eating foods that contain a lot of different nutrients, getting enough sleep and exercising.

Non-communicable diseases

You cannot get non-communicable diseases from another person. They are usually chronic (long-term) diseases.

Four of the most common non-communicable diseases are:

⊙ cardiovascular disease
⊙ cancer
⊙ respiratory disease
⊙ diabetes

Non-communicable diseases are usually caused by having an unhealthy lifestyle, living in an unhealthy environment or genetics (family history).

People can lower their risk factors for non-communicable diseases by changing their lifestyle habits, such as losing weight or stopping smoking.

Keyword

habit

a usual way of behaving, something that a person does often in a regular and repeated way

7

Communicable and non-communicable disease

Activity 3

Write a sentence that describes each of the following:

Communicable diseases are caused by bacteria, viruses and parasites which can be spread from one person to another. They can be spread through contact with an infected person, through contaminated food or drinks, through insect bites or the air.

Non-communicable diseases

Non-communicable diseases are usually caused by having an unhealthy lifestyle, living in an unhealthy environment or genetics (family history).

Types of non-communicable disease

Activity 4

Using your textbook, name four non-communicable diseases. Then try to think of at least three more examples that are not in the book. Compare your answers with the rest of the class.

Examples from the textbook:

1. cardiovascular disease
2. cancer
3. respiratory disease
4. diabetes

Your own examples:

Arthritis

obese

Kidney diseases

Page 12 - Activity 3 - Communicable and noncommunicable diseases
Page 12 - Activity 4 - Types of noncommunicable diseases

7

Q: A. Can non-communicable diseases spread from person to person?
   B. What is a communicable disease?

A. Yes. communicable diseases can spread from person to person

Communicable diseases

Keyword	
bacteria	
microorganisms that cause disease or illness	

Communicable diseases are caused by bacteria, viruses and parasites which can be spread from one person to another. They can be spread through contact with an infected person, through contaminated food or drinks, through insect bites or the air.

8

Q: A. Identify medical needs during pregnancy.

7.4 Medical care during pregnancy

Medical needs during pregnancy

Think

Can you think of any reasons why a pregnant woman might need medical care during her pregnancy?

During pregnancy, there are many reasons why a woman might need medical care. If she knows what to expect during her pregnancy, she might be able to identify when she needs medical attention. If a woman believes that she needs medical attention, it is important to assist her to get the help she needs.

Ultrasound scans

An ultrasound scan will let the doctor know if the foetus is growing and developing at a healthy rate. The scan will record the heart rate and breathing.

Hypertension

Women can experience hypertension (high blood pressure) during pregnancy. High blood pressure during pregnancy should be monitored by a healthcare professional.

8

7.4 Medical care during pregnancy

Activity 17

Ultrasound scans and hypertension

Answer the questions about ultrasound scans and hypertension.

1. What will an ultrasound scan tell a doctor?

An ultrasound scan will let the doctor know if the foetus is growing and developing at a healthy rate

2. What two things will an ultrasound scan record?

Heart rate and breathing

3. What is another name for hypertension?

High blood pressure

4. Who should supervise a pregnant woman if she has hypertension?

A healthcare professional

8

Q: A. How does a doctor check that a foetus is growing and developing at a healthy rate?

B. What is an ultrasound scan used for?

Ultrasound scans

An ultrasound scan will let the doctor know if the foetus is growing and developing at a healthy rate. The scan will record the heart rate and breathing.

9 Q: **A.** Explain the characteristics of pregnancy.

PREGNANCY STAGES

What is pregnancy?

Discussion: Pregnancy

Discuss what you understand about pregnancy.

Pregnancy, also known as gestation, is the time when a woman carries her developing embryo/foetus in her womb. The foetus is the name given to the unborn baby that is still developing in the womb. Pregnancy can be categorised into three stages which are called trimesters. Pregnancy usually lasts 40-42 weeks.

Q: A. What is pregnancy?
B. Identify the stages of the lifecycle that are involved in pregnancy.
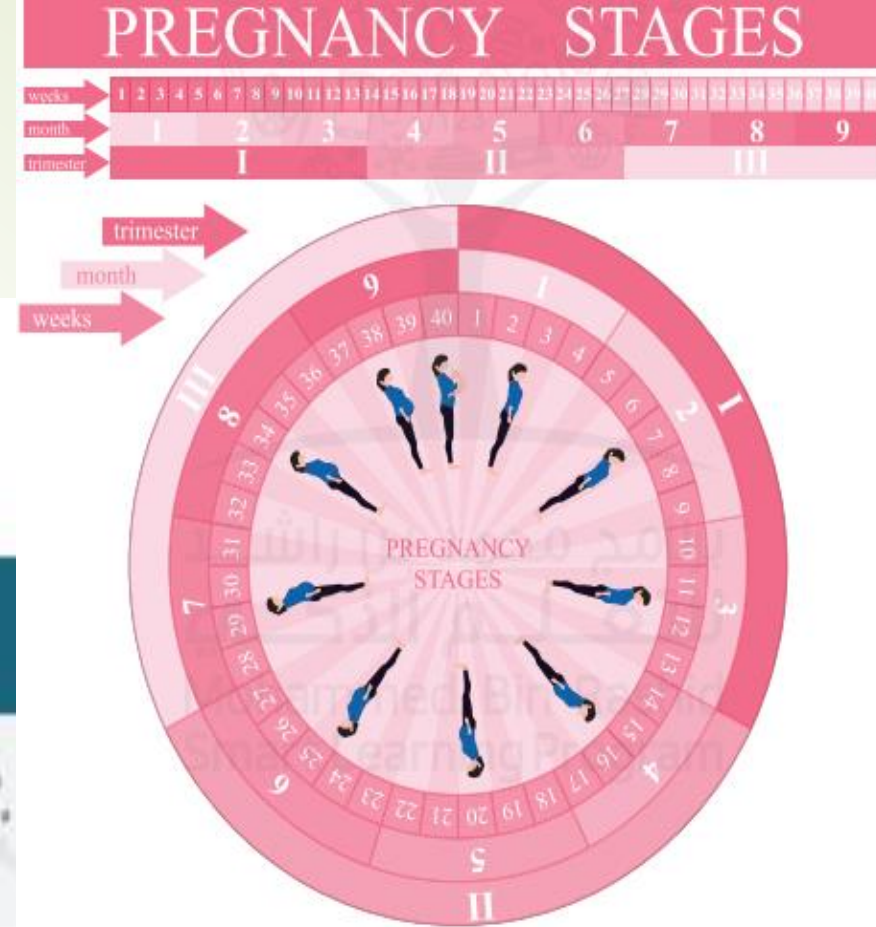
PREGNANCY STAGES

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PREGNANCY STAGES

What is pregnancy?

💬 Discussion: Pregnancy

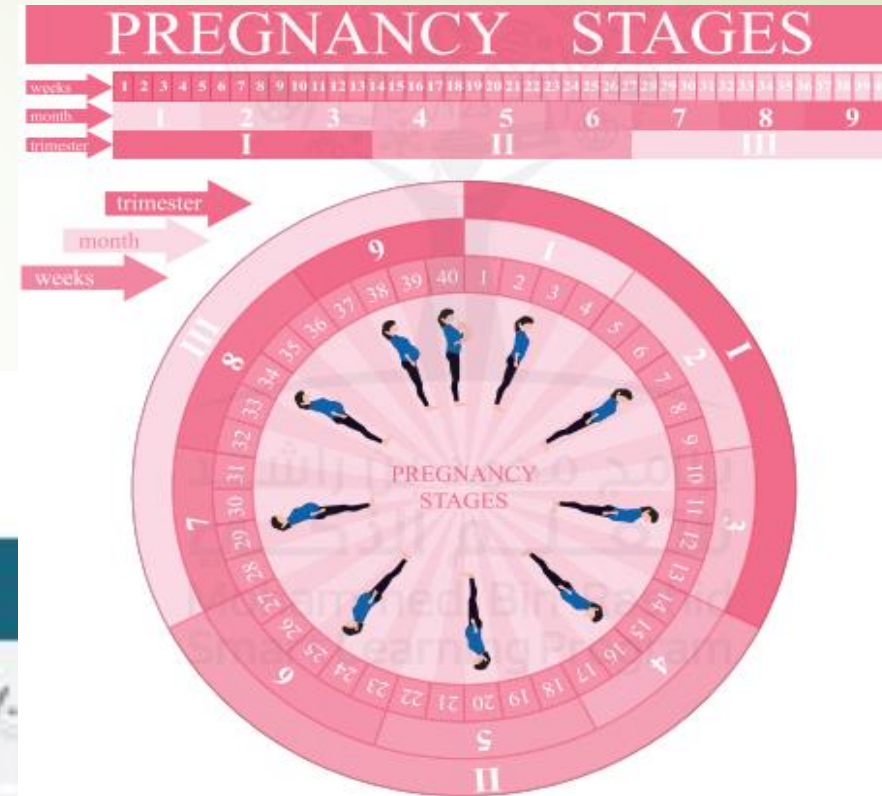Discuss what you understand about pregnancy.

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10

7.1 Stages of pregnancy

Discussion: Pregnancy

Discuss what you already know about pregnancy and answer the following questions.

How long does pregnancy last?

40 – 42 weeks

What do you think a woman should eat during pregnancy?

A healthy balanced diet

Do you think a woman should exercise during pregnancy?

Yes, she should exercise during pregnancy

What should a baby eat when it is born?

Breast feeding only until 6 months

10

Q: A. How long does pregnancy last?
B. What is the name given to the stages of pregnancy?

A. 40 – 42 weeks

B. Trimesters

11

Q: Connect the importance of personal health behaviours such as healthy diet, adequate sleep and personal hygiene with the prevention of illness and disease.

5.3 Personal health behaviours for disease prevention

Controlling cholesterol

Cholesterol is a type of fat that is made by the body and found in certain foods. A small amount of cholesterol is important for the body's organs to work properly. But having too much can block the blood vessels and increase the risk of diseases of the blood vessels and heart.

Fast food, unhealthy snacks and processed foods contain high amounts of cholesterol. Limiting these foods can lower the risk of diseases caused by high cholesterol.
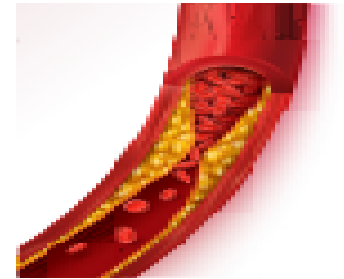
A healthy diet and mental health

Having a healthy diet not only keeps the body healthy, but it has also been shown to benefit mental health and lower stress levels. This can lower the risk of diseases such as depression and anxiety.

Improving your diet may:

- improve your mood.
- lower your stress levels.
- help you think more clearly.

Think

Have you noticed that the foods you eat can affect your mood? Do you feel better when you have been eating healthy foods, and not so good when you have been eating a lot of unhealthy foods?

11

Activity 12

Healthy diet for disease prevention

Answer the questions below about how a healthy diet can reduce the risk of certain diseases.

Identify two diseases that you have a higher risk of developing if you are overweight.

Obesity, cardiovascular diseases

Which mineral helps in maintaining healthy bones?

Calcium

Name two foods that are a good source of this mineral.

Milk and yoghurt

What can happen if you have too much cholesterol in the body?

Milk, yoghurt

11

Q: A. How does cholesterol have a negative effect on health?
B. What is cholesterol?

Controlling cholesterol

Cholesterol is a type of fat that is made by the body and found in certain foods. A small amount of cholesterol is important for the body's organs to work properly. But having too much can block the blood vessels and increase the risk of diseases of the blood vessels and heart.

Fast food, unhealthy snacks and processed foods contain high amounts of cholesterol. Limiting these foods can lower the risk of diseases caused by high cholesterol.

12 Q: A. Explore the role of physical activity in the prevention of illness and disease.

Recommendations for exercise

Keyword

recommendation

an idea or plan of what should be done

The World Health Organization (WHO) recommends the following guidelines for exercise:

Children and teenagers aged 5-17 years old

- Sould do at least 60 minutes of moderate to high-intensity activity each day.
- Should do activities that strengthen muscles and bones at least three times a week.

Adults aged 18-64 years old

- At least 150 minutes of moderate-intensity physical activity or 75 minutes of high-intensity activity each week should be done.
- For further health benefits, adults should do 300 minutes of moderate-intensity physical activity or more each week.
- Aerobic activities such as running or swimming should last for at least 10 minutes at a time.
- Activities that strengthen the muscles such as weight training should be done at least two times each week.

Activity21 — Exercise intensity

Write a sentence to describe moderate and high-intensity activity.

Moderate-intensity activity:

Moderate-intensity activity is when you are working at 70-80% of your maximum heart rate (MHR).

You should still be able to talk comfortably during moderate-intensity exercise and you should be sweating lightly.

High-intensity activity:

A high-intensity activity is an exercise that creates a big increase in your heart and breathing rate. You should be working at 80-85% of MHR.

You should be able to speak a few words, but not hold a conversation and you will be sweating a lot.

Activity 22 — Moderate or high-intensity?

Decide if you think these activities are moderate-intensity (M) or high-intensity (H).

	M or H?
Cycling over 16km per hour	H
Gardening	M
Walking at about 5km per hour	M
Running	H
Doing housework	M

12

Q: A. Describe the WHO recommendations for physical activity.
B. List examples of moderate-intensity physical activity.

The World Health Organization (WHO) recommends the following guidelines for exercise:

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- For further health benefits, adults should do 300 minutes of moderate-intensity physical activity or more each week.
- Aerobic activities such as running or swimming should last for at least 10 minutes at a time.
- Activities that strengthen the muscles such as weight training should be done at least two times each week.

Moderate-intensity activity

Moderate-intensity activity is when you are working at 70-80% of your maximum heart rate (MHR).

You should still be able to talk comfortably during moderate-intensity exercise and you should be sweating lightly.

Examples of moderate-intensity activity include:

- Moderate walking (around 5km per hour)
- Cycling (less than 16km per hour)
- Swimming slowly
- Gardening/heavy housework
- Golf

13 Q: A. Explore the role of physical activity in the prevention of illness and disease.

5.4 Physical activity and disease prevention

Mental and emotional health

Exercise reduces stress and improves your mood. This is because exercise makes your body release endorphins which can make you feel happy and improve your mood.

Keyword

endorphins

a group of hormones which are released by the brain and nervous system to reduce pain and increase wellbeing

Exercise can improve mental and emotional health by:

- improving energy levels - this makes you feel more alert and less tired during the day.
- improving emotional wellbeing - most people feel calmer and better about themselves after they exercise.
- raising brain function by improving motor skills, problem-solving and increasing attention span.

Social health

Another important benefit of exercise is improved social health, especially if you do team sports or exercise with a group.

Taking part in group sports can help to:

- increase confidence.
- learn leadership skills.
- make new friends.
- increase motivation to exercise.

Having a healthy social life is important. It has been shown to improve health by reducing stress, improving heart and lung functions, and helping the body's immune system.

13

Mental, emotional and social health

Below is a list of benefits of doing physical activity. Decide if they are related to mental and emotional health or social health. Draw a line from the description to the correct answer.

increased confidence	make new friends	improve your mood	improved energy levels

raised brain function	increased motivation to exercise	learn leadership skills	improved wellbeing

Mental and emotional health

Social health

13

Q: **A.** How does physical activity benefit social health?
B. How does physical activity benefit mental and emotional health?

5.4 Physical activity and disease prevention

Mental and emotional health

Exercise reduces stress and improves your mood. This is because exercise makes your body release endorphins which can make you feel happy and improve your mood.

Ⓦ **Keyword**

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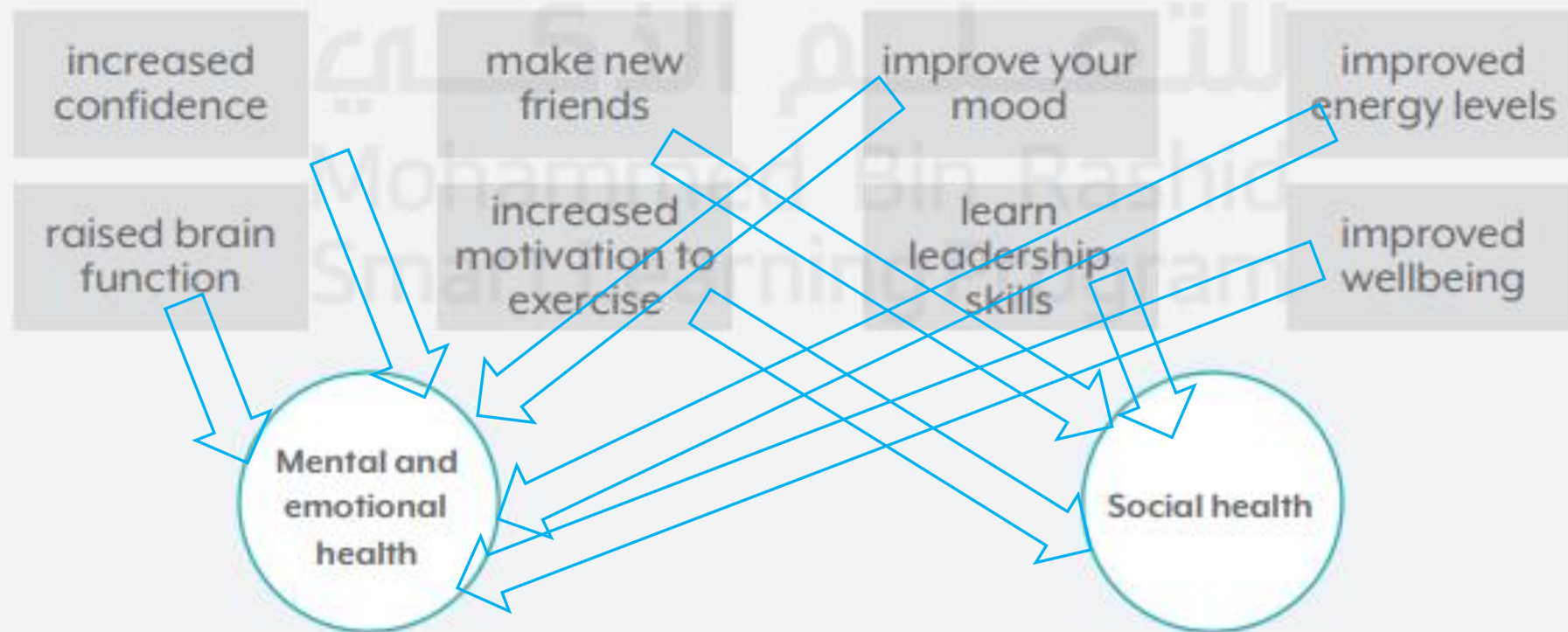- ⊙ increase motivation to exercise.

Having a healthy social life is important. It has been shown to improve health by reducing stress, improving heart and lung functions, and helping the body's immune system.

14 Q: A. Identify the importance of health screening for early detection of certain illnesses and diseases.

5.5 Medical care for disease prevention

Screening

Screenings are medical tests that doctors use to check for diseases and health conditions in people before there are any signs and symptoms. Most often, screening is done on healthy people.

Medical screening for diseases can be done in many ways, for example, blood tests, scans, and physical examinations.

Regular health checks and screenings are extremely important in disease prevention. They can:

⊙ diagnose diseases or health issues before they start to affect you.
⊙ allow you to get treatment early. This increases your chance of recovering from certain life-threatening diseases, for example cancer.
⊙ allow you to keep track of your health, such as weight and blood pressure.
⊙ help you to live a longer, healthier life.
⊙ give you peace of mind. Knowing that you have been screened for certain conditions can help you to stop worrying.

The difference between screening and diagnostic tests

The main difference between screening and diagnostic tests is that screenings are done on people who do not have any signs or symptoms of a disease.

Diagnostic tests are done when a person has signs or symptoms of a disease or has had a positive result from a general screening.

The following table shows the differences between a screening test and a diagnostic test in more detail.

Screening tests	Diagnostic tests
To check for early signs of a disease	To confirm the presence (or absence) of a disease
For large numbers of people	For one person who has signs or symptoms of a disease, or has had a positive screening result
One simple test, such as a blood test	More in-depth testing which may include many different tests
Low cost, to be able to afford testing for large numbers of people	Higher costs, because of the need for more accurate testing

5.5 Medical care for disease prevention

STARTER ▶ **Unscramble the words**

Using the clues, unscramble the words to learn some of the keywords about medical care for disease prevention.

1. To test people to see if they have the early signs of a disease or illness:

eeingnrcs .... screening

2. Something that is injected into a person to protect them from a disease:

ecacvin .... vaccine

3. When people are made immune or resistant to an infectious disease:

noitasinuimm .... Immunisation

4. To identify a disease or illness in someone:

nosedgai .... diagnose

Activity 31

Screening or diagnostic tests?

Read the description and then name the type of test.

Description	Type of test
This is done when a person has signs or symptoms of a disease or has had a positive screening test.	Diagnostic test
This is done when people who do not have any signs or symptoms of a disease.	Screening test

14

Q: **A.** What are screening tests?
B. What are diagnostic tests?

Screening

Screenings are medical tests that doctors use to check for diseases and health conditions in people before there are any signs and symptoms. Most often, screening is done on healthy people.

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The following table shows the differences between a screening test and a diagnostic test in more detail.

15 Q: A. Identify the importance of health screening for early detection of certain illnesses and diseases.

General screening tests for adults

For	To screen for	Type of test	Screening frequency
People over 20 years old	Obesity	Body mass index (BMI) and waist circumference	Once a year
People over 20 years old	Hypertension (high blood pressure)	Blood pressure measurement	Every 2 years (more if high risk)
People over 20 years old	Diabetes High cholesterol	Fasting blood glucose/lipids test	Every 3 years (more if high risk)
People over 50 years old	Bowel cancer	Test to find blood in stools or colonoscopy	Once a year
Women 25-65 years old	Cervical cancer	Pap smear test	Every 3 years
Women 40-69 years old	Breast cancer	Mammogram	Every 2 years
Men over 45 years old	Prostate cancer	Blood test or physical examination	Every 2-3 years

What do screening results mean?

If someone gets a 'negative' result from a screening test it means they are at low risk of having the condition they were screened for. However, it does not mean that they will never develop the condition in the future. This is why certain screening needs to be carried out every few years.

Activity 28 — Screening tests at different ages

For each of the different ages, write two recommended screening tests.

20s and 30s ..... Blood pressure and skin cancer check

.....

40s ..... Cardiovascular disease risk assessment

..... Eye checks for glaucoma

50s and 60s ..... Osteoporosis disease risk assessment

..... Sight and hearing tests

Activity 29 — General screening

Fill in the missing parts of the table about screening tests for adults.

For	To screen for	Type of test	Screening frequency
People over 20 years old	Obesity	Body mass index (BMI) and waist circumference	Once a year
People over 20 years old	Hypertension (high blood pressure)	Blood pressure measurement	Every 2 years (more if high risk)
People over 20years old	Diabetes High cholesterol	Fasting blood glucose/ lipids test	Every 3 years (more if high risk)
People over 50 years old	Bowel cancer	Test to find blood in stools OR colonoscopy	Once a year
women 25-45 years old	Cervical cancer	Pap smear test	Every 3 years
Women 50-69 years old	Breast cancer	Mammogram	Every 2 years
Men over 45 years old	Prostate cancer	Blood test or physical examination	Every 2-3 years

15

Q: A. What type of test is done to screen for bowel cancer?
B. What is a mammogram?

General screening tests for adults

For	To screen for	Type of test	Screening frequency
People over 20 years old	Obesity	Body mass index (BMI) and waist circumference	Once a year
People over 20 years old	Hypertension (high blood pressure)	Blood pressure measurement	Every 2 years (more if high risk)
People over 20 years old	Diabetes High cholesterol	Fasting blood glucose/lipids test	Every 3 years (more if high risk)
People over 50 years old	Bowel cancer	Test to find blood in stools or colonoscopy	Once a year
Women 25-65 years old	Cervical cancer	Pap smear test	Every 3 years
Women 40-69 years old	Breast cancer	Mammogram	Every 2 years
Men over 45 years old	Prostate cancer	Blood test or physical examination	Every 2-3 years

B. Mammogram is the test for breast cancer for women aged 40 – 69 years old .

16 Q: A. Demonstrate anthropometric measurements to assess nutritional status.

Growth charts

The WHO provide growth charts for all children up to nineteen years of age. These charts are used to compare height and weight against people of the same age and gender. They are also used to follow a child's growth and can identify some medical problems at an early age.

Lines or curves on the growth chart show the height of many other children at each age.

The WHO growth charts are divided up into age groups. There are charts for babies aged 0-2 years, 2-5 years, and 5-19 years. In general, people do not grow after nineteen years of age.

What you will need

To figure out where someone fits on the growth chart there are a few things you need to know.

- ⊙ The person's gender (male or female)
- ⊙ The person's age (usually in years)
- ⊙ The person's height (in centimetres)

How the chart works

The bottom of the chart shows the age of the person. Once you find the age of the person, you then look for their height on the chart. Make a mark on the chart where the age meets the height. The red, yellow, and green lines on the chart are called percentiles.

Height-for-age GIRLS — 5 to 19 years (percentiles), World Health Organization
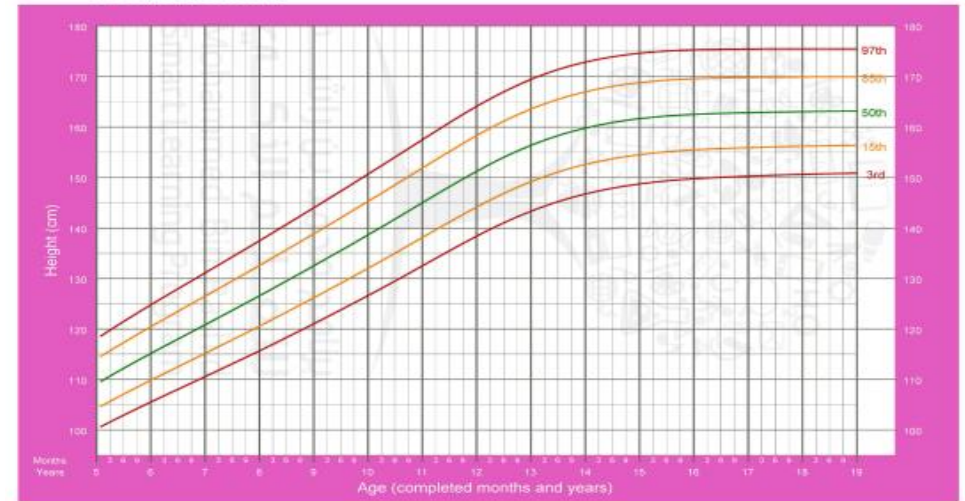
Height-for-age BOYS — 5 to 19 years (percentiles), World Health Organization

16
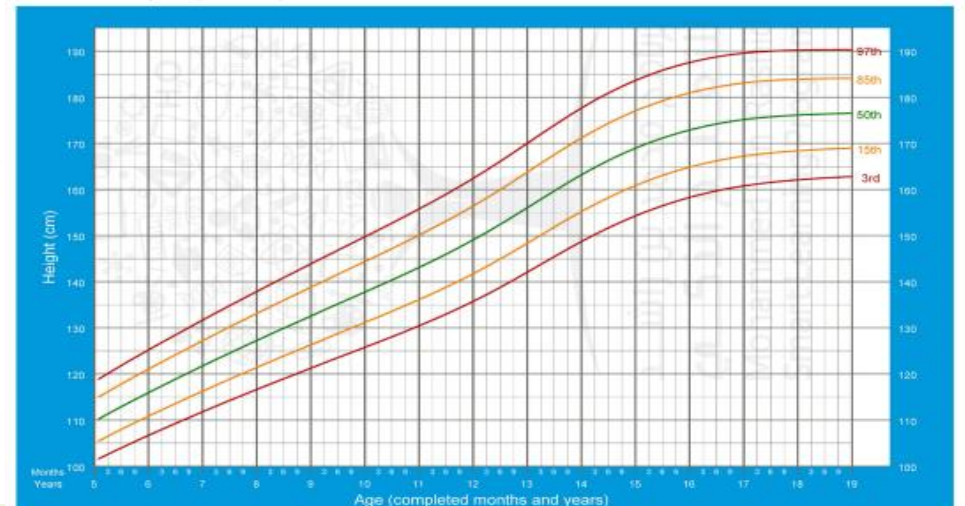
Plotting my height

Activity 13

Using the WHO growth charts provided, plot where you are on the growth chart.

My gender	My age (in years and months)	My height (in centimetres)

Which percentile do you belong to on the growth chart?

....

What does this mean?

....

....

16 Q: **A.** What are growth charts?
B. What do percentiles on growth charts mean?

Growth charts

The WHO provide growth charts for all children up to nineteen years of age. These charts are used to compare height and weight against people of the same age and gender. They are also used to follow a child's growth and can identify some medical problems at an early age.

Lines or curves on the growth chart show the height of many other children at each age.

The WHO growth charts are divided up into age groups. There are charts for babies aged 0-2 years, 2-5 years, and 5-19 years. In general, people do not grow after nineteen years of age.

6.2 Anthropometry

Interpreting the results

As you know, the red, yellow and green lines on growth charts are called percentiles. Percentiles show how many other people (of the same age as the person being measured) are taller, shorter and the same height.

17

Q: A. Demonstrate anthropometric measurements to assess nutritional status.

6.2 Anthropometry

Anthropometric measurements

Anthropo means 'human' and *metry* means 'measurement'. Anthropometry, therefore, is the physical measurements of the body. Anthropometric measurements include measuring height and weight. It can also include measuring proportions of the hips, waist, legs, arms and skinfolds. Medical professionals analyse the results to find out the physical status of a person.

Anthropometric measures are particularly useful in children as it can show if they are growing and developing at the correct rate and highlight any problems with their nutritional status.

These measurements will provide a quick indication of malnutrition such as obesity, stunting and wasting.

Waist circumference

Waist circumference is the total distance around the waist. A larger waist circumference shows there is more abdominal fat (fat around the middle of the body).

High levels of abdominal fat are linked with non-communicable diseases such as cardiovascular disease, cancer and diabetes.

Age, gender and ethnicity will affect the measurement.

Waist circumference - Males	Waist circumference - Females	Classification
Less than 94cm	Less than 80cm	Desirable
94-102cm	80-88cm	High risk
More than 102cm	More than 88cm	Very high risk

How to measure waist circumference

Follow these steps to accurately to measure waist circumference.

- Place the tape at the mid-point between the top of the hip bone and the lower ribs. It can be measured over thin clothes.
- The tape should not be too tight or too loose.
- Abdominal muscles should be relaxed.
- The measurement should be taken after breathing out.

17

Waist circumference

Activity 6

The table below shows various peoples' waist circumference. Decide if their waist circumference is desirable, high risk, or very high risk.

Name	Waist circumference	Classification
Meera	82cm	High risk
Fatima	76cm	Desirable
Ahmed	98cm	High risk
Suhail	105cm	Very high risk

17

Q: A. What is a healthy waist circumference for males?
B. What is a healthy waist circumference for females?

Waist circumference - Males	Waist circumference - Females	Classification
Less than 94cm	Less than 80cm	Desirable
94-102cm	80-88cm	High risk
More than 102cm	More than 88cm	Very high risk

18 | **Q: A.** Describe the biochemical methods of assessing nutritional status.

6.4 Biochemical methods

Biochemical methods

As you have learned, the B in ABCDE of nutritional assessment stands for biochemical methods. These can also be called laboratory measurements of nutritional assessment.

Keyword

biochemistry

a part of science that explores the chemistry of living things

Biochemical methods of assessment involve testing samples of blood and urine. Samples are taken and tested in a lab facility. When your body digests the food you eat, chemicals and nutrients are released into your bloodstream. These travel around your body and are either stored, used up as energy or exit through your urine. Therefore, blood and urine are good ways find out the nutrients that are present in someone's body.

The results

To have accurate results of biochemical measurements, the laboratory specialist who interprets the results needs to know certain things about the patient who is being tested. The information they need to know includes:

- previous medical history.
- current medications.
- a clinical examination report.

Biochemical methods of assessing nutritional status are the most accurate as they show exactly how much of a certain nutrient or enzyme is present in the body. It is easy to see if someone is deficient in any nutrients by looking at their biochemical markers. Sometimes deficiencies and nutrient-related diseases are itentified before symptoms develop.

Biochemical methods do not require the patient to remember what foods they have eaten, or how much of a certain food they have eaten.

18

Biochemical methods of assessment involve testing samples of blood and urine. Samples are taken and tested in a lab facility. When your body digests the food you eat, chemicals and nutrients are released into your bloodstream. These travel around your body and are either stored, used up as energy or exit through your urine. Therefore, blood and urine are good ways find out the nutrients that are present in someone's body.

19 **Q: A.** Describe the care for a new-born.

7.5 Care for a newborn

Breastfeeding is important for many reasons:

- ⊙ It encourages bonding between the mother and the baby.
- ⊙ It contains all the nutrients the baby needs.
- ⊙ It is free, safe and readily available.
- ⊙ It helps to develop the baby's immune system.
- ⊙ It is environmentally friendly.

At the end of the six months, it is recommended that the baby should be introduced to home-made food, but breastfeeding should continue until two years of age or longer.

Colostrum

Colostrum is the first form of milk that is produced by the mother straight after the baby is born. This is what the baby feeds on for their first few days during breastfeeding. It is a sticky yellowish substance. It is concentrated and provides the best nutrients for the baby, including protein, vitamins and minerals.

Colostrum helps the baby to get rid of meconium. This is the baby's first stool after birth. During the first week, the amount of colostrum produced reduces and more mature milk is produced. Mature milk may look thin at the beginning. During the feed, mature milk becomes creamy and rich. This combination of thin at the beginning and rich during the feed will satisfy the hunger and thirst needs of the baby.

19

Fill in the blanks

Fill in the blanks using the words from the table.

one	two	Health	nutrients
sticky	exclusively	colostrum	six

Breastmilk is the milk that is produced by the mother and fed to her baby. Breastmilk contains all of the ......nutrients...... and antibodies that the baby needs to grow, develop and to fight infection.

The World ......health...... Organization recommends that babies should be ...exclusively...... breastfed for the first ......six......months.

Breastfeeding should continue until the child is ......two......years of age.

Babies should be breastfed within ......one......hour of birth.

The first form of milk that is produced is called ..colostrum...........

It is a ......sticky......yellowish substance and it contains the best nutrients for the baby.

19

Q: A. What name is given to the first form of milk produced by a mother?
B. What is the relationship between colostrum and meconium?

Colostrum

Colostrum is the first form of milk that is produced by the mother straight after the baby is born. This is what the baby feeds on for their first few days during breastfeeding. It is a sticky yellowish substance. It is concentrated and provides the best nutrients for the baby, including protein, vitamins and minerals.

Colostrum helps the baby to get rid of meconium. This is the baby's first stool after birth. During the first week, the amount of colostrum produced reduces and more mature milk is produced. Mature milk may look thin at the beginning. During the feed, mature milk becomes creamy and rich. This combination of thin at the beginning and rich during the feed will satisfy the hunger and thirst needs of the baby.

20 Q: A. Describe the care for a new-born.

Breastmilk contains all of the nutrients and antibodies the baby needs to grow and develop and fight infection. It gives the baby all of the energy they need to meet their demands.

Mothers should try to feed their baby for the first time within one hour of birth.

The World Health Organization recommends that women breastfeed exclusively for the first six months. This means that no other food or drinks are given to the baby during this time.

BREASTFEEDING SUPPORT

World Health Organization

WHAT MUMS CAN DO

BEFORE YOUR BABY ARRIVES, GET THE FACTS ON BREASTFEEDING.

WHEN YOUR BABY'S BORN, TRY TO GIVE THE FIRST BREASTFEED WITHIN AN HOUR.

YOU'LL NEED HELP WITH LEARNING TO BREASTFEED & SO WILL YOUR BABY. DON'T BE AFRAID TO ASK FOR IT!

MAKE SURE YOU GET PLENTY OF HEALTHY FOOD, WATER & REST.

20

Fill in the blanks

Fill in the blanks using the words from the table.

one	two	Health	nutrients
sticky	exclusively	colostrum	six

Breastmilk is the milk that is produced by the mother and fed to her baby. Breastmilk contains all of the ....nutrients..........and antibodies that the baby needs to grow, develop and to fight infection.

The World ....health......... Organization recommends that babies should be ....exclusively.......breastfed for the first ....six........months.

Breastfeeding should continue until the child is ....two........years of age.

Babies should be breastfed within ....one........hour of birth.

The first form of milk that is produced is called ..colostrum..........

It is a ....sticky.........yellowish substance and it contains the best nutrients for the baby.

20

Q: A. What are the WHO recommendations on breastfeeding?
B. When should breastfeeding begin?

The World Health Organization recommends that women breastfeed exclusively for the first six months. This means that no other food or drinks are given to the baby during this time.

Breastmilk contains all of the nutrients and antibodies the baby needs to grow and develop and fight infection. It gives the baby all of the energy they need to meet their demands. Mothers should try to feed their baby for the first time within one hour of birth.

21 Q: A. Explain the main characteristics of each trimester of pregnancy.

7.1 Stages of pregnancy

The following changes happen during the first trimester:

- Early in the pregnancy, the nervous system (brain and spinal cord) begins to develop.
- The umbilical cord forms.
- The heart, eyes, ears, mouth, nose, hands and feet take shape.
- By the end of the first trimester, the organs have formed and are developing.

Did you know?
The umbilical cord connects the foetus to the placenta. It carries oxygen and nutrients to the foetus.
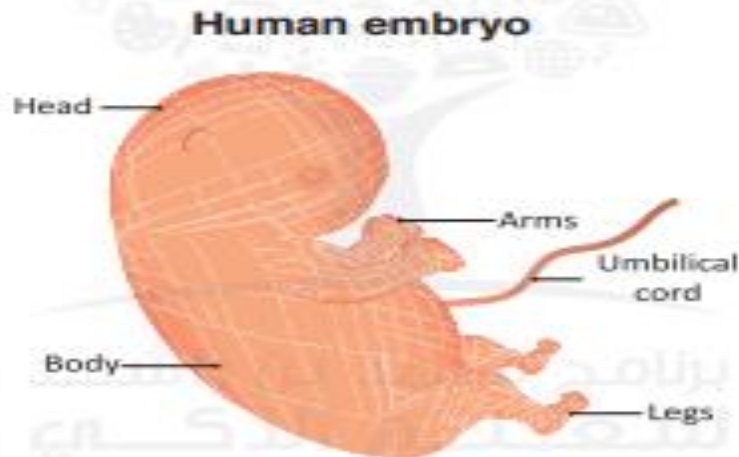
Human embryo

- Head
- Arms
- Umbilical cord
- Body
- Legs

There are many symptoms that may happen for the pregnant woman during the first trimester. These include:

- Fatigue (tiredness)
- Heartburn
- Missed period
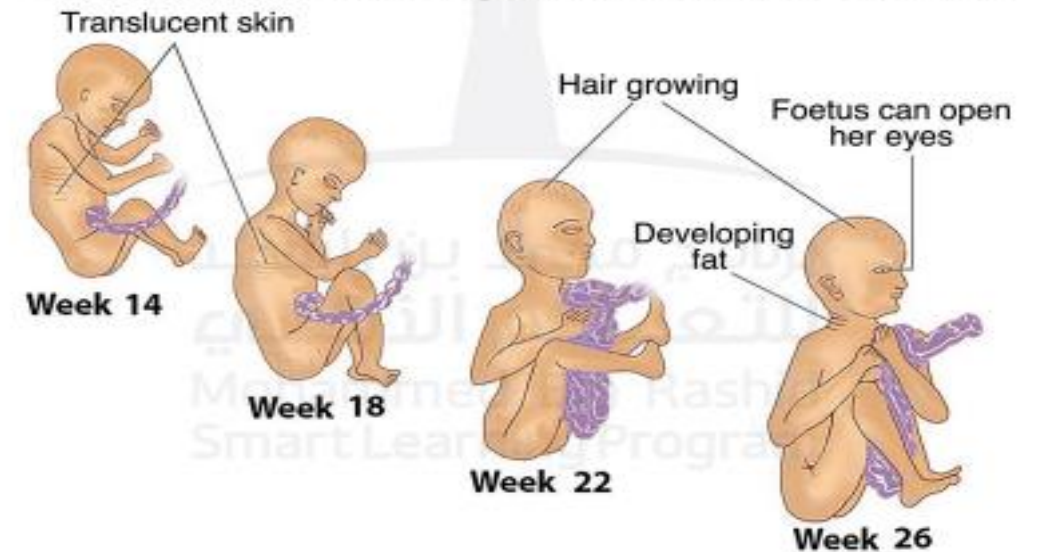- Nausea and possibly vomiting (this is known as morning sickness)

Trimester 2

During the second trimester, the following changes happen to the foetus:

- The foetus begins to make urine.
- They develop meconium. This is the first bowel movement.
- The gender will become apparent.
- The musculoskeletal system is developing, and the bones begin to harden.
- The skin is translucent (almost see-through).
- The foetus can suck their thumb, and their fingerprints form.
- By the end of this trimester, they are gaining some body fat.

The second trimester is one where a lot of women start to feel well. Morning sickness eases off, and the growth of the foetus is noticed as the bump gets larger. The mother can feel the foetus moving.

Second trimester: stages of foetal development

- Translucent skin
- Hair growing
- Foetus can open her eyes
- Developing fat
- Week 14
- Week 18
- Week 22
- Week 26

21

Activity 3

Changes in each trimester

A woman experiences physical changes during each trimester. Match the changes described on the left to the correct trimester.

Difficulty sleeping

Morning sickness

Mother can feel the foetus moving

Fatigue

Mother starts to feel well

Trimester 1

Trimester 2

Trimester 3
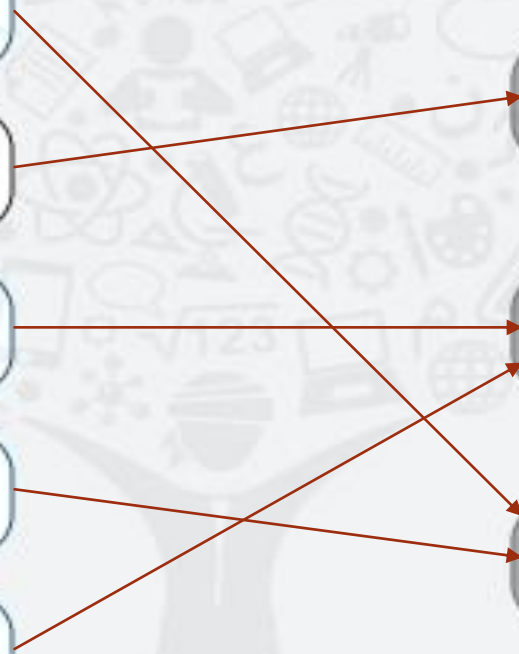
21

Q: A. Describe the symptoms felt in the first trimester of pregnancy.
B. Describe the symptoms in the second trimester of pregnancy.

There are many symptoms that may happen for the pregnant woman during the first trimester. These include:

- Fatigue (tiredness)
- Heartburn
- Missed period
- Nausea and possibly vomiting (this is known as morning sickness)

The second trimester is one where a lot of women start to feel well. Morning sickness eases off, and the growth of the foetus is noticed as the bump gets larger. The mother can feel the foetus moving.

22

Q: A. Describe a healthy diet during pregnancy and changes in nutritional requirements.

7.2 Healthy diet and nutritional requirements during pregnancy

Extra nutritional requirements

Discussion: Nutrient needs during pregnancy

Discuss with your class what you already know about the nutrient requirements during pregnancy.

All nutrients are important during pregnancy to help a woman stay healthy and help the foetus grow and develop.

You have learned the benefits of eating foods from each of the food groups, but a pregnant woman should also pay special attention to including certain nutrients in her diet, these are folic acid, calcium and iron.

Folic acid

Keyword

supplement

something that provides a nutrient; it can be added to a food or a drink or taken in liquid or tablet form

Women should take a supplement of 400μg of folic acid before, and up to the 12th week of pregnancy. Taking a supplement of folic acid can help prevent the foetus developing defects of the brain, spine or spinal cord (these are known as neural tube defects). Folic acid is the synthetic (man-made) version of folate (vitamin B9).

Certain foods contain natural folate. These foods should be eaten every day. Green leafy vegetables like spinach are a good source of folate. Broccoli and asparagus are also good sources. Some foods are fortified with folic acid.

Example

Fortified foods are foods which have vitamins or minerals added to them to improve nutrition and add health benefits. Foods often fortified with folic acid are breakfast cereals and bread.

Q: A. Why is folate an important nutrient to have during pregnancy?
B. What are the extra nutritional requirements during pregnancy?

Women should take a supplement of 400µg of folic acid before, and up to the 12th week of pregnancy. Taking a supplement of folic acid can help prevent the foetus developing defects of the brain, spine or spinal cord (these are known as neural tube defects). Folic acid is the synthetic (man-made) version of folate (vitamin B9).

B. Folic acid, calcium and iron

23

Q: A. Identify medical needs during pregnancy including when emergency medical care is required.

7.4 Medical care during pregnancy

When to get emergency medical care

If a pregnant woman experiences any of the following, she should get immediate medical attention.

- No movement from the foetus
- Excessive fatigue
- Excessive thirst
- Feeling of anxiety
- Heavy bleeding
- More than three contractions per hour
- Sudden loss of fluid
- Unexplained pains

Labour

Keyword

labour

the process of childbirth

Labour, or childbirth, is the process of the baby leaving the womb. Signs of labour include lower back pain or pain around the stomach, the release of amniotic fluid known as the 'waters breaking', and contractions.

If a woman thinks she is in labour, she should get medical attention.

There are three stages of labour:

Stage 1

During the first stage of labour, the woman will feel contractions, which are the muscles in the womb tightening and relaxing. These can be identified by a dull pain. These contractions will be regular.

During early labour, women can time their contractions. They will be around five minutes apart. There is less time between contractions at the later stages of labour.

Q: A. When should a pregnant women seek emergency medical care?
B. Fatima cannot feel her foetus moving, what should she do?

When to get emergency medical care

If a pregnant woman experiences any of the following, she should get immediate medical attention.

- No movement from the foetus
- Excessive fatigue
- Excessive thirst
- Feeling of anxiety
- Heavy bleeding
- More than three contractions per hour
- Sudden loss of fluid
- Unexplained pains

B. She should get emergency medical care

24   **Q: A.** Calculate and analyse simple nutritional indices such as body mass index (BMI) and body fat percentage.

6.3 Body mass index (BMI) and body fat percentage

Body mass index (BMI)

Body mass index (BMI) is a measurement of a person's weight for their height which is used to identify weight status. So, to calculate BMI, you need to know the person's weight and height.

Remember

Think back to the lesson when you learned how to measure weight and height.

Calculating BMI

BMI is calculated using the following equation:

$$BMI = weight\ (kg) \div height^2\ (m^2)$$

EX Example

Sara weighs 58kg and her height is 1.61m.

To calculate Sara's BMI, first, we must work out her height².

1.61 × 1.61 = 2.592 (height²)

Then we can calculate her BMI.

58 ÷ 2.592 = 22.4

Sara's BMI is 22.4

After calculating BMI, the next step is to understand the results. The BMI number will fall into one of four categories; underweight, normal weight, overweight or obese (there are different classes of obesity).

| <18.5 UNDERWEIGHT | 18.5-24.9 NORMAL | 25-29.9 OVERWEIGHT | 30-34.9 OBESE | 35+ MORBIDLY OBESE |

Name: Shahad   **Age** 25
Gender: Female   **Height:** 1.62m
Weight: 72.8kg   **Body fat:** 25.7kg

Calculate BMI

Calculate each person's BMI and decide their BMI classification.

$$BMI = weight\ (kg) \div height^2\ (m^2)$$

1. Hind
Height: 1.62m   Weight: 68kg
BMI ....

68/ (1.62)² = 25.9

BMI classification ..... Overweight

2. Shouq
Height 1.58m   Weight 60kg
BMI ....

60/ (1.58)² = 24.03

BMI classification ..... Normal

3. Mohammed
Height 1.79m   Weight 55kg
BMI ....

55/ (1.79)² = 17.17
Under weight

BMI classification .....

4. Rashid
Height 1.77m   Weight 85kg
BMI ....

85/ (1.77)² = 27.13
Over weight

BMI classification .....

<18.5 UNDERWEIGHT	18.5-24.9 NORMAL	25-29.9 OVERWEIGHT	30-34.9 OBESE	35+ MORBIDLY OBESE

Name: Shahad   **Age 25**
Gender: Female   **Height:**   1.62m
Weight: 72.8kg   **Body fat:** 25.7kg

Q: A. What is the formula used to calculate BMI?
B. Using the information provided, calculate Shahad's BMI.

B. Weight = 72.8 kg
   Height = 1.62m

BMI = weight/ height^2 (m)^2

= 72.8/ (1.62)^2 = 27.74

Calculating BMI

BMI is calculated using the following equation:

$$BMI = weight\ (kg) \div height^2\ (m^2)$$

25 Q: **A.** Calculate and analyse simple nutritional indices such as body mass index (BMI) and body fat percentage.

Example

Sara weighs 58kg and her height is 1.61m.

To calculate Sara's BMI, first, we must work out her height^2.

$1.61 \times 1.61 = 2.592$ (height^2)

Then we can calculate her BMI.

$58 \div 2.592 = 22.4$

Sara's BMI is 22.4

After calculating BMI, the next step is to understand the results. The BMI number will fall into one of four categories; underweight, normal weight, overweight or obese (there are different classes of obesity).

You can see from the information on the previous page, people with higher BMIs are overweight or obese. People who have a high BMI are more likely to develop non-communicable diseases like diabetes and heart disease.

Underweight

A BMI result lower than 18.5 is a sign that the person is underweight. In this case, the person should speak to a healthcare professional about gaining weight in a healthy way.

Healthy weight

A BMI between 18.5 and 24.9 is a sign that the person is a healthy weight. They should aim to maintain this weight by eating a healthy, balanced diet.

Overweight

A BMI result between 25 and 29.9 is a sign that the person is overweight. They should consider talking to a healthcare professional about losing some weight in a healthy way.

Obese

There are different levels of obesity, but any BMI above 30 is classed as being obese. A person with a BMI of more than 30 should seek professional help as they need to reduce their weight.

<18.5 UNDERWEIGHT	18.5-24.9 NORMAL	25-29.9 OVERWEIGHT	30-34.9 OBESE	35+ MORBIDLY OBESE

Name: Shahad   Age 25
Gender: Female   Height: 1.62m
Weight: 72.8kg   Body fat: 25.7kg

Activity 15

BMI ranges

Write the correct BMI range (numbers) beside each classification of BMI.

BMI classification	BMI
Underweight	Less than 18
Normal	18.5 – 24.9
Overweight	25 – 29.9
Obese	20 – 34.9

Activity 17

Reliability of BMI

The image below shows two men. Both men have a BMI of 32.

What is the BMI classification of someone with a BMI of 32?

obese

Do you agree that this weight status is the correct label for both men? Explain your answer.

No, because some times based on the BMI the person could be obese but their body fat percentage could be quite low because he has a lot of muscles

What else should you measure to achieve a more accurate result?

Body fat percentage

Name: Shahad   **Age 25**
Gender: Female   **Height: 1.62m**
Weight: 72.8kg   **Body fat: 25.7kg**

Q: A. Identify the BMI category that Shahad belongs to.
   B. How could Shahad improve her BMI score?

A. She is over weight

Overweight

A BMI result between 25 and 29.9 is a sign that the person is overweight. They should consider talking to a healthcare professional about losing some weight in a healthy way.

26 **Q: A.** Calculate and analyse simple nutritional indices such as body mass index (BMI) and body fat percentage.

Calculating body fat percentage

After you have measured body fat, you can then calculate the body fat percentage. You need three things for this:

- ⊙ Total body weight (TBW) in kilograms (kg)
- ⊙ Body fat in kilograms (kg)
- ⊙ Age

The formula for calculating body fat percentage:

$$\frac{\text{Body fat}}{\text{TBW}} \times 100$$

Example

Hamad's body fat is 30kg and his TBW (total body weight) is 100kg. He is 30 years old.

$30 \div 100 = 0.3$

$0.3 \times 100 = 30\%$

Hamad's body fat percentage is 30%.

Maha's body fat is 14kg and her total body weight (TBW) is 58kg. She is 22 years old.

$14 \div 58 = 0.24$

$0.24 \times 100 = 24\%$

Maha's body fat percentage is 24%.

Name: Shahad   **Age** 25
Gender: Female   **Height:**   1.62m
Weight: 72.8kg   **Body fat: 25.7kg**

Q: A. What is the formula to calculate body fat percentage?
    B. Using the information provided, calculate Shahad's body fat percentage.

The formula for calculating body fat percentage:

$$\frac{\text{Body fat}}{\text{TBW}} \times 100$$

B. Body fat = 25.7 kg
   TBW = 72.8m

Body fat percentage =

        Body fat/ TBW X 100

= 25.7/ 72.8 X 100 = 35.3%

TBW: Total body weight

27

Q: A. Calculate and analyse simple nutritional indices such as body mass index (BMI) and body fat percentage.

6.3 Body mass index (BMI) and body fat percentage

Understand the results

After you calculate the body fat percentage, you need to interpret the results. Body fat percentages change as people get older. This is why it is important to know the person's age, so you can accurately identify which category they are in.

There are four possible category that a person can be in:

Blue

This category shows that the person has too little body fat for their age.
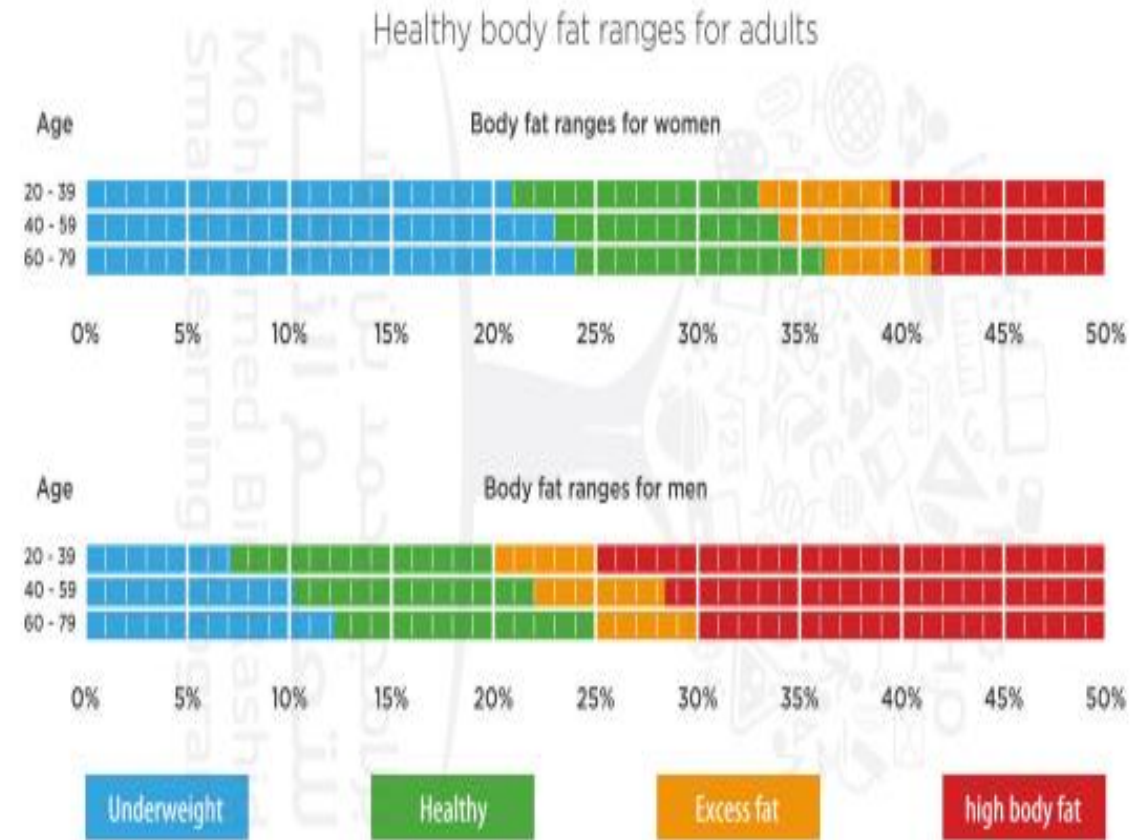
Green

This category shows that the person has a healthy amount of body fat for their age.

Amber

This category shows that the person has gone above the healthy body fat for their age and they should try to reduce it.

Red

This category shows that the person has so much body fat for their age that it could have a negative impact on their health by putting them at a higher risk of certain conditions. They need to reduce it.

Healthy body fat ranges for adults

Name: Shahad   **Age** 25
Gender: Female   **Height:**   1.62m
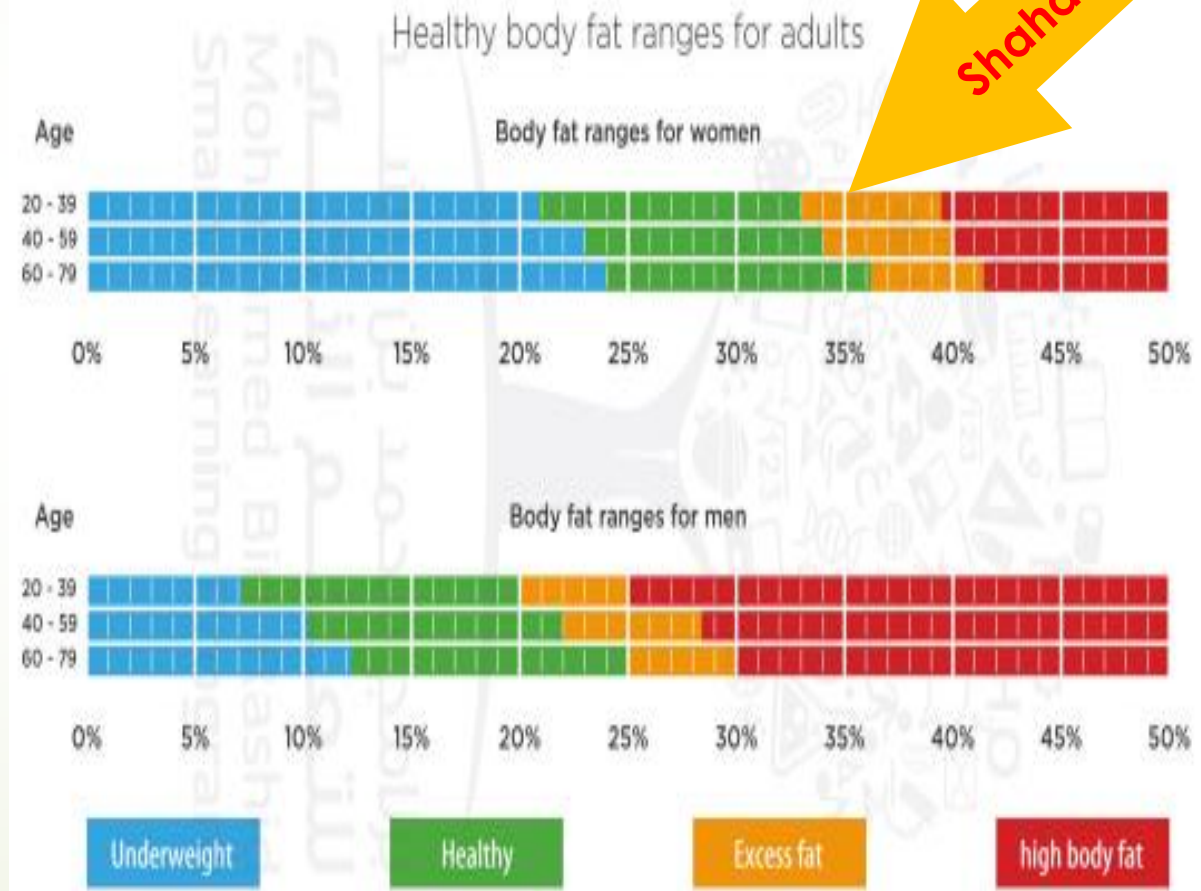**Weight:** 72.8kg   **Body fat:** 25.7kg

Q: A. Refer to the body fat ranges in the textbook (page 69) to decide which body fat range she belongs to.
         B. Describe the meaning of Shahad's body fat range.

A. Body fat percentage for Shahad = 35.3%,
    age = 25 years
She is in an **amber** color so she had **excess fat**

B. This category shows that she has gone above the healthy body fat for their age, and she should try to reduce it.

Shahad

Healthy body fat ranges for adults

Age — Body fat ranges for women
20 - 39
40 - 59
60 - 79
0% 5% 10% 15% 20% 25% 30% 35% 40% 45% 50%

Age — Body fat ranges for men
20 - 39
40 - 59
60 - 79
0% 5% 10% 15% 20% 25% 30% 35% 40% 45% 50%

Underweight   Healthy   Excess fat   high body fat

28

Q: A. Calculate and analyse simple nutritional indices such as body mass index (BMI) and body fat percentage.

6.3 Body mass index (BMI) and body fat percentage

You can see from the information on the previous page, people with higher BMIs are overweight or obese. People who have a high BMI are more likely to develop non-communicable diseases like diabetes and heart disease.

Underweight

A BMI result lower than 18.5 is a sign that the person is underweight. In this case, the person should speak to a healthcare professional about gaining weight in a healthy way.

Healthy weight

A BMI between 18.5 and 24.9 is a sign that the person is a healthy weight. They should aim to maintain this weight by eating a healthy, balanced diet.

Overweight

A BMI result between 25 and 29.9 is a sign that the person is overweight. They should consider talking to a healthcare professional about losing some weight in a healthy way.

Obese

There are different levels of obesity, but any BMI above 30 is classed as being obese. A person with a BMI of more than 30 should seek professional help as they need to reduce their weight.

Body fat percentage

Sometimes it is useful to use BMI with body fat percentage to assess health. A person could be overweight or obese according to their BMI, but their body fat percentage could be quite low. This happens a lot with sports players and athletes who have a lot of muscle.
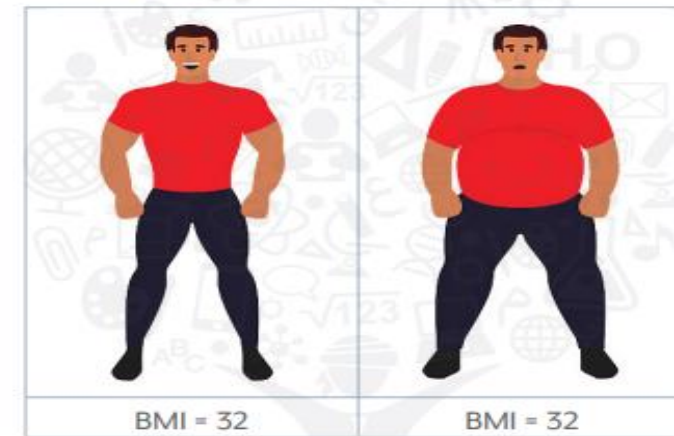
BMI = 32   BMI = 32

Everyone has fat on their body. We need fat to protect our organs, provide energy, and help our bodies stay warm. Too much fat on the body can increase the risk of developing non-communicable diseases such as heart disease and cancer.

Everyone has fat on their body. We need fat to protect our organs, provide energy, and help our bodies stay warm. Too much fat on the body can increase the risk of developing non-communicable diseases such as heart disease and cancer.

Measuring body fat

Before you can calculate body fat percentage, you must first measure the amount of fat on the body.

The most accurate way to measure body fat is by using a **DEXA scanner**. This is an X-ray that shows an exact breakdown of fat mass, bone density and muscle mass.

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Q: A. Calculate and analyse simple nutritional indices such as body mass index (BMI) and body fat percentage.

6.3 Body mass index (BMI) and body fat percentage

Another method for calculating body fat is to measure **skinfold thickness**. Skinfolds are areas of skin that can fold when pinched. Skinfolds are measured using a tool called callipers which grip the fat through the skin and can be used at different parts of the body.

Bioelectrical impedance analysis (BIA) is another method of measuring body fat. It sends a weak electrical current through the body. The person does not feel the electrical current. The machine can tell when the electrical current is travelling through fat as opposed to muscle.

28 Q: **A.** Calculate and analyse simple nutritional indices such as body mass index (BMI) and body fat percentage.

Calculating body fat percentage

After you have measured body fat, you can then calculate the body fat percentage. You need three things for this:

- Total body weight (TBW) in kilograms (kg)
- Body fat in kilograms (kg)
- Age

The formula for calculating body fat percentage:

$$\frac{\text{Body fat}}{\text{TBW}} \times 100$$

Example

Hamad's body fat is 30kg and his TBW (total body weight) is 100kg. He is 30 years old.

$30 \div 100 = 0.3$

$0.3 \times 100 = 30\%$

Hamad's body fat percentage is 30%.

Maha's body fat is 14kg and her total body weight (TBW) is 58kg. She is 22 years old.

$14 \div 58 = 0.24$

$0.24 \times 100 = 24\%$

Maha's body fat percentage is 24%.

Understand the results

After you calculate the body fat percentage, you need to interpret the results. Body fat percentages change as people get older. This is why it is important to know the person's age, so you can accurately identify which category they are in.

There are four possible category that a person can be in:

Blue

This category shows that the person has too little body fat for their age.

Green

This category shows that the person has a healthy amount of body fat for their age.

Amber

This category shows that the person has gone above the healthy body fat for their age and they should try to reduce it.

Red

This category shows that the person has so much body fat for their age that it could have a negative impact on their health by putting them at a higher risk of certain conditions. They need to reduce it.

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Name: **Shahad** Age **25**
Gender: **Female** Height: **1.62m**
Weight: **72.8kg** Body fat: **25.7kg**

Q: **A.** What advice would you give to Shahad after completing this nutritional assessment?
B. Name another anthropometric measurement that you could take.

A. She should consider talking to a healthcare professional about losing some weight in a healthy way

B. Waist circumference

Do not forget to revise all the lessons from your textbook and workbook

Believe in yourself, stay strong, do the impossible

Arwa Abdelmoneim